

ИНОСТРАННЫЙ ЯЗЫК
В ТЕХНИЧЕСКОМ УНИВЕРСИТЕТЕ

English



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Учебник английского языка

для технических
университетов и вузов



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по машиностроительным и приборостроительным
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технических университетов и вузов*

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Учебник состоит из 12 уроков-тем, объединенных единой тематикой и содержащих: основной текст, назначением которого является обучение чтению технической литературы по специальностям машино- и приборостроительных вузов; дополнительные тексты и диалоги для ознакомительного чтения, активизации грамматических структур и общественной лексики, развития навыков профессионального обучения по изучаемой тематике; письменные и устные грамматические и лексические упражнения коммуникативной направленности.

В 4-е издание (3-е — в 2002 г.) включены лексические упражнения для углубления навыков работы с текстом, а также дополнительные материалы для факультета «Инженерный бизнес и менеджмент» и специальности «Юриспруденция».

Учебник успешно используется при подготовке дипломированных специалистов в МГТУ им. Н.Э. Баумана и других высших учебных заведениях.

Для студентов технических университетов и вузов машино- и приборостроительного профиля. Полезен для специалистов, желающих научиться различным формам общения на английском языке.

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ПРЕДИСЛОВИЕ К 1-МУ ИЗДАНИЮ

Настоящий учебник предназначен для студентов технических университетов и институтов, изучавших английский язык в средней школе, и составлен в соответствии с требованиями программы по иностранным языкам для неязыковых вузов. Учебник рассчитан на 270—280 часов аудиторных занятий. Он может быть использован для самостоятельного совершенствования знаний теми, кто хочет научиться читать научно-техническую литературу.

Цель учебника — подготовить студентов к чтению специальной научно-технической литературы для извлечения информации, а также привить им навыки устной речи по специальной и неспециальной тематике.

При организации учебного материала авторы ставили целью повторение и обобщение основных грамматических тем и лексики, пройденных в средней школе, а также углубленное изучение тех грамматических и лексических явлений, которые необходимы студентам для профессионального общения на английском языке. Тематика текстов определяется тем минимумом общетехнических знаний, которым обладают студенты первых двух курсов технических университетов и институтов. Тексты учебника отобраны из оригинальных английских и американских источников с учетом их информативности и соответствия научно-техническим достижениям и изложены по принципу возрастания трудности и постепенного усложнения языка и тематики.

Учебник состоит из 12 уроков-тем, дополнительных текстов, поурочного грамматического справочника, англо-русского словаря и приложения. Каждый урок-тема содержит четыре текста, три из которых объединены общей тематикой, а четвертый, как правило, имеет страноведческую направленность. Все эти тексты предназначены для обучения различным видам чтения. Первый текст урока является основным и подлежит тщательной проработке и анализу для изучения тех грамматических и лексических явлений, которым посвящен данный урок. Второй и третий тексты служат развитию навыков чтения и извлечения необходимой информации, а также навыков беседы по соответствующей тематике, что способствует закреплению лексико-грамматического материала, проработанного в основном тексте. Четвертый текст урока посвящен вопросам страноведения и дает возможность провести беседу, дискуссию за круглым столом, ролевую игру с привлечением иллюстративного и дополнительного материала, подобранного преподавателем и студентами самостоятельно.

Каждый урок-тема начинается с предтекстовых упражнений для проработки грамматического и лексического материала. Эти тематические упражнения предназначены для преодоления лексических и грамматических трудностей основного текста и требуют детальной проработки в аудитории. Упражнения составлены на основе лексики предшествующих уроков. Упражнения после основного текста даны для закрепления грамматического и лексического материала.

Упражнения на словообразование содержат в основном активную лексику. Эти упражнения, а также работу с интернациональной лексикой рекомендуется выполнять в аудитории. При этом преподаватель постоянно обращает особое внимание студентов на сопоставление сходств и расхождений грамматической структуры и лексического фонда родного и изучаемого языков. Широкий выбор лексико-грамматических упражнений позволяет это сделать.

Для практического использования студентом приобретенных знаний нужно обладать умением самостоятельно работать над языком. Поэтому авторы сочли необходимым ввести специальную серию упражнений для самостоятельной работы. Эти упражнения даны для закрепления пройденной лексики и грамматики и подготовки к работе со словарем. Заключительное упражнение каждого урока (перевод текста без словаря) служит для контроля усвоения студентом грамматических и лексических аспектов данного урока.

Неотъемлемой частью общения является умение вести беседу на профессиональные темы, для чего приведены упражнения рубрики Conversation, задания к которым даны по-английски. При этом авторы следуют принципу постепенного усложнения как текстов, так и заданий. Обширная тематика и большое количество текстов, заданий к ним и упражнений дают возможность преподавателю варьировать работу в зависимости от уровня подготовки группы и давать индивидуальные задания студентам.

Дополнительные тексты по тематике и лексике связаны с основными текстами уроков. Они предназначены для самостоятельной и индивидуальной работы и могут быть использованы в качестве дополнительного материала при проведении дискуссий, бесед и конференций.

В конце учебника даны англо-русский словарь и приложения. В словарь включены все слова, встречающиеся в текстах и упражнениях.

Авторы выражают благодарность за ценные указания, советы, помощь и замечания сотрудникам кафедры иностранных языков Н.Н. Пыховой и Л.М. Степановой.

ПРЕДИСЛОВИЕ К 4-МУ ИЗДАНИЮ

В четвертом издании «Учебника английского языка для технических университетов и вузов» изменено внешнее оформление. Это связано с тем, что учебник вошел в серию «Иностранный язык в техническом университете».

В третьем издании полностью заменены тексты 1А и 12А, дополнены и расширены некоторые предтекстовые упражнения. После каждого урока основного курса даются дополнительные задания: упражнения к тексту, небольшой текст-упражнение, упражнения к этому тексту, направленные в основном на работу с лексикой и соответствующей терминологией, ее закрепление, развитие языковой догадки. Упражнения такого типа развивают у студентов навыки работы с незнакомым текстом. Кроме того, после каждых трех уроков дан раздел Revision, включающий грамматические и лексические упражнения по проработанным урокам и небольшой текст. Этот материал должен способствовать повторению, закреплению пройденного материала и может быть использован в качестве рубежного контроля.

В раздел Supplementary Texts добавлены тексты, связанные с тематикой уроков основного курса. В поурочный грамматический справочник введены темы «Местоимения», «Дополнения», а также новые таблицы ряда грамматических тем.

В настоящее время появились новые факультеты и специальности в технических университетах, поэтому в дополнение к основному курсу дается материал по инженерному бизнесу и менеджменту и юриспруденции для завершающего этапа обучения.

Произношение дается по словарю «Everyman's English Pronouncing Dictionary» Даниила Джонса (Daniel Jones).

LESSON 1

Глаголы *to be, to have*

Времена группы *Indefinite (Simple) Active, Passive*

Оборот *there + be*

Порядок слов в предложении

Суффиксы *-tion, -ic, -al, -ly*

Text 1A. *Higher Education in Russia*

Text 1B. *Cambridge*

Text 1C. *Higher Education in the USA*

Text 1D. *A Letter*

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

Упражнение 1. Поставьте следующие предложения в Past Indefinite или Future Indefinite, добавляя, где необходимо, слова *last/next week, last/next year, tomorrow, yesterday* и т.д.

1. I am very busy today. 2. They are in the reading-room now.
3. It is a cold day today. 4. We are students of one of the Moscow Institutes. 5. You are late for the lecture. 6. Mary is a good student. 7. Students have four exams in January. 8. Today they have time to go to the cinema. 9. We have some English magazines. 10. The book has many diagrams. 11. I have good news. 12. She has a map of England.

Упражнение 2. Поставьте следующие предложения в Past и Future Indefinite, добавляя слова *yesterday, tomorrow* и т.д.

1. There is a large reading-room in our university. 2. There are thirty students in our group. 3. There is a new film in our club today. 4. There is one telephone in our office. 5. There are many students at the lecture.

Упражнение 3. Поставьте следующие предложения в Past или Future Indefinite, добавляя слова *last/next year, yesterday, tomorrow, last/next week, last/next summer* и т. д.

1. We study six days a week. 2. I go to the institute every day. 3. My friend lives in a hostel. 4. Usually I get up at 7 o'clock. 5. My studies begin at half past eight. 6. We have four lectures every day. 7. After lectures we go to the dinning room. 8. We do our home-work for the next day. 9. At night I read and watch TV. 10. On Sunday I visit my friends.

Упражнение 4. Поставьте сказуемое в отрицательной форме.

1. Today our lectures begin at 10 o'clock in the morning. 2. We were school-children last year. 3. We had four entrance exams in summer. 4. Yesterday the first-year students saw the institute laboratories. 5. We took all the necessary books from the library. 6. I got excellent marks for my entrance exams. 7. He knows the meaning of the word «engineering» (техника, машиностроение, инженерное дело). 8. The students of our group will meet in the laboratory. 9. The librarian gave us all the necessary books.

Упражнение 5. А. Раскройте скобки, поставив общие вопросы.

1. (You do) ... anything interesting last weekend? 2. (He works) ... at the institute every day? 3. (They will come) ... to see you soon? 4. (We studied) ... at school last year? 5. (She will go) ... to the theatre next week? 6. (The students worked) ... in the laboratory yesterday? 7. (Ann gets up) ... at 7 o'clock? 8. (There are) ... many laboratories at our institute? 9. (There were) ... many students at the lecture? 10. (There will be) ... a library in the new building? 11. (We have) ... two lectures today? 12. (The book has) ... many diagrams? 13. (You had) ... four exams last semester?

В. Вставьте соответствующие вопросительные слова.

1. ... is your name? 2. ... doesn't understand this grammar rule? 3. ... of you studies French? 4. ... is the answer to my question? 5. ... do you live in Moscow? 6. ... were you born? 7. ... lectures you on mathematics? 8. ... do you study? 9. Here are the books. ... is yours? 10. ... knows the answer to this question?

Упражнение 6. Поставьте вопросы к каждому члену предложения и дайте отрицательную форму.

1. He entered the Aviation Institute last year. 2. My sister studies at the university. 3. The third-year students will have industrial training next summer.

Упражнение 7. Прочитайте и переведите текст.

My University

There are many universities in Moscow. The head of a university is Rector. Usually there are several faculties in a university. Each faculty has a number of specialized departments and is headed by dean. The course of studies lasts (продолжается) 5–6 years.

The academic year in this country's higher schools begins on the 1-st of September and is divided into two terms (semesters). Students take exams at the end of each semester. If the results of the examinations are good, students get grants. Twice a year students have vacations — two weeks in winter and two months in summer.

My University has several buildings, old and new ones. There are many various laboratories. There is a very good library and a computer center in the main building.

Every faculty has its own specialized library, laboratories, workshops and computer centers.

The first- and second-year students study general engineering subjects (общетехнические предметы). In the third year students begin to study specialized subjects.

A very good tradition of our University is that theory is accompanied by practical training. Students begin to work at the University's well-equipped (хорошо оборудованный) laboratories and in senior years at various plants, design offices and research institutes of this country.

It is interesting but difficult to study at our University, especially for the first-year students as they do not know yet how to organize their work and time.

Упражнение 8. Переведите предложения, поставьте их в вопросительной и, где возможно, в отрицательной форме.

1. The books are taken from the library. 2. He was asked to help one of our students. 3. Many newspapers and magazines are published in this country. 4. That problem was discussed at our meeting. 5. The diagrams were brought by our monitor. 6. The exams will be taken in January. 7. They were told to do their work quickly. 8. The study of theory is accompanied by practical training. 9. A new laboratory was opened last year. 10. We shall be given a new task tomorrow. 11. Every institute is headed by Rector. 12. In summer you will be sent to a big plant for your industrial training.

1. This work must be done quickly. 2. Many complex problems can be solved with the help of computers. 3. Lomonosov may be called the founder of higher education in Russia. 4. Books on this subject can be found in every library. 5. Many basic subjects must be studied by the first and second-year students.

СЛОВООБРАЗОВАНИЕ

Упражнение 9. Переведите следующие производные слова:

глагол + tion = существительное

to examine — проверять, экзаменовать → examination — экзамен

to apply — применять, использовать → application — применение, использование

to educate — education; to adopt — adoption; to graduate — graduation; to specialize — specialization; to organize — organization;

существительное + al = прилагательное

education — образование → educational — образовательный

industry — industrial; profession — professional; person — personal;

существительное + ic = прилагательное

science — наука → scientific — научный;

basis — основа → basic — основной

прилагательное + ly = наречие

high — высокий → highly — высоко

quick — quickly; usual — usually.

Упражнение 10. Прочитайте и переведите интернациональные слова.

qualification, qualified ['kwɒlɪfaɪd], speciality [ˌspeʃɪ 'æltɪ], specialist, special, specialize, engineer [ˌendʒɪ'nɪə], serious ['sɪəriəs], adoption, style [staɪl], method ['meθəd], distance, system, foundation, satellite ['sætələɪt], course [kɔ:s], instruction, mathematics [ˌmæθɪ'mætrɪks], physics ['fɪzɪks], chemistry ['kemɪstrɪ], history, economics, to concentrate ['kɒnsəntreɪt], bachelor ['bætʃələ], sport center, basic, exchange.

Упражнение 11. Прочитайте и запомните произношение следующих слов.

high [haɪ], higher education, highly-qualified, important [ɪm'pɔ:tənt], provide [prə'vaɪd], development [dɪ'veləpmənt],

process ['prəuses], progress ['prəugres], steadily ['stedɪli], enough [ɪ'nʌf], through [θru:], thorough ['θʌrə], quality ['kwɒlɪti], natural ['nætʃrəl], science ['saɪəns], scientist ['saɪəntɪst], require [rɪ'kwaɪə], curricula [kə'ɾɪkjulə], foreign ['fɔrɪn], major ['meɪdʒə], future ['fju:tʃə], further ['fə:ðə], research [rɪ'sə:tʃ], enterprise ['entəpraɪz], know [nəʊ], knowledge ['nɒlɪdʒ], graduate ['grædʒueɪt].

СЛОВА И СЛОВСОЧЕТАНИЯ ДЛЯ ЗАПОМИНАНИЯ

as conj — как; по мере того как, когда; так как, поскольку

as well — так же

affect v — влиять, воздействовать на

become v — становиться

consider v — считать, рассматривать, учитывать

develop v — развивать, разрабатывать; преобразовать

development n — развитие, разработка

enable v — давать возможность

ensure v — обеспечивать, гарантировать

especially adv — особенно

further a — дальнейший

improve v — улучшать, совершенствовать

mean (meant) v — значить, означать

means n — средство, способ

number n — число, количество

a number of — ряд, несколько

prepare v — готовить, подготавливать

provide v — снабжать, обеспечивать

receive v — получать

remain v — оставаться

quality n — качество

thorough a — основательный, доскональный, тщательный

usually adv — обычно

to play a part — играть роль

to take into consideration — принимать во внимание, в расчет

at present — в настоящее время

Text 1A

Прочитайте и переведите текст.

Higher Education in Russia

Higher education plays an important part in the life of any country as it provides the country with highly-qualified specialists

for future development and progress. It trains people to become teachers, engineers, doctors and other professional workers.

In all the industrial countries standards of living are steadily changing; this means that the kind of education, which was good enough thirty years ago, is not necessarily good for them today. The serious need to find ways and means of ensuring continuous and thorough adoption of the universities to contemporary needs in our rapidly changing world is widely recognized. And this means that styles of teaching, quality of learning materials¹ and organization of the university itself have to be continuously brought up to date² and improved.

Besides, knowledge and information which comes through the mass media must also be taken into consideration. This information explosion³ has affected every field of study, especially, of course, in the natural and applied sciences and in all other sciences as well. The increase of information requires new methods and new approaches to students' training and instruction⁴.

At present a new system of education is introduced in this country — a distance education system. This computer system of learning helps working professionals to continue their education while remaining at their jobs. This system enables people to get knowledge and a good foundation in the sciences basic to his or her field of study. Distance learning has developed over years⁵ from satellite video courses to modern videoconferencing through personal computers.

The academic year usually lasts 9 months and is divided into two terms (semesters). The first- and second-year students obtain thorough instructions in the fundamental sciences of mathematics, physics, chemistry and drawing as well as computer engineering and a number of others. The curricula are enriched and broadened⁶ by instructions in such subjects as foreign languages, history and economics.

At the third year students get more advanced knowledge and begin to concentrate on their special interests, so to say, their «major» subject and take many courses in this subject. Specialized study and courses will help students to become specialists and prepare them for their future work.

After four years students will get a bachelor's degree. Then the students may go on with their studies and in a year or two of further study and research get a master's degree. After graduating from the university they may go on with their study and research and may get a still higher degree.

About 75 percent of students receive state grants and 15 percent are sponsored by enterprises. Universities have their own students' hostels and some of them have large and excellent sport centers.

Education is a process through which culture is preserved, knowledge and skills are developed, values are formed, and information is exchanged.

Education is the way to success.

Notes to the Text

1. learning materials — учебный материал
2. to bring up to date — довести до современных требований
3. information explosion — информационный взрыв
4. training and instruction — подготовка и обучение
5. over years — за многие годы
6. curricula are enriched and broadened — программы (курсы обучения) обогащаются и расширяются

УПРАЖНЕНИЯ

Упражнение 12. Просмотрите упражнение 7 и текст 1А, ответьте на вопросы.

1. When does the academic year begin in this country? 2. How many exams did you pass to enter the University? 3. Do you pay for your education? 4. Do students get grants? 5. What subjects do students study in the first year? 6. Which subject is the most interesting for you? 7. Is there a sport center in your University? 8. What degree do students get after four years of study? 9. What degree can a student get after two years of further study and research? 10. What new education system is introduced in this country? 11. What specialities do people get after graduating from a university? 12. Why is higher education important in the life of every country?

Упражнение 13. Сравните предложения в действительном и страдательном залоге, переведите их.

1. Students asked the lecturer many questions. The lecturer was asked many questions. 2. The monitor told the first-year students to come to the laboratory. The first-year students were told to come to the laboratory. 3. Usually a lab assistant shows the equipment to the students. Usually the equipment is shown to the students by a lab assistant. Usually students are shown the equipment by a lab assistant. 4. Students watched the process with great attention. The process was watched with great attention. 5. Tomorrow our teacher

will give us a new task. A new task will be given tomorrow. We shall be given a new task tomorrow. 6. Practice accompanies theory. Theory is accompanied by practice. 7. He asked me to bring a dictionary. He was asked to bring a dictionary. 8. The teacher told the students to sign their drawings. The students were told to sign their drawings. 9. The dean will send the students to a big plant in summer. The students will be sent to a big plant in summer. 10. He taught us to use the lab equipment. We were taught to use the lab equipment.

Упражнение 14. А. Переделайте предложения из действительного в страдательный залог.

1. You open the door. 2. We asked questions. 3. He will finish his project next week. 4. He can do this exercise. 5. They invited me to their conference. 6. I saw a new film. 7. My sister writes letters regularly. 8. Universities develop new methods of students' training. 9. After graduating from the University the students may get a still higher degree. 10. The study of foreign languages, history and economics must improve the curricula of technological universities.

В. Переведите предложения в страдательном залоге, дайте варианты, где возможно.

1. Mathematics, strength of materials, mechanics, elements of machines as well as engineering physics are studied at technological institutes. 2. The development of science is closely connected with the development of higher education. 3. Students are provided with hostels, well-equipped laboratories and libraries. 4. Any country must be provided with good specialists in all branches of science and technology for its further development. 5. Large sums of money are spent by the state to train highly-qualified engineers. 6. Much attention must be paid to improve the standards of higher education. 7. Students of technological institutes are trained to analyse various facts and theories. 8. The scientific and technological progress of a country is determined by the qualification of specialists. 9. Some institutes of technology are reorganized into universities. 10. The country must be provided with specialists capable of working with the technology of tomorrow effectively.

Упражнение 15. Найдите Participle I и Participle II, переведите предложения.

1. The students studying at the institutes passed entrance exams in summer. 2. The subjects studied in the first two years are very important for future engineers. 3. The lecture delivered by our dean

was on new methods of technology. 4. The man delivering this lecture is our professor on mathematics. 5. An article discussing the new system of school education appeared in all newspapers. 6. The results of the experiments discussed yesterday will be published. 7. The attention paid to the study of fundamental subjects is great. 8. Students interested in computer engineering enter technological institutes. 9. The number of specialists connected with new branches of science and engineering is increased every year.

УПРАЖНЕНИЯ ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ

Упражнение 16. Определите по суффиксу, к какой части речи относятся следующие слова:

administration, gradual, electric, intensively, practical, dramatic, integral, specific, operation, illumination, naturally, identical, organization, originally, arctic, technical, acceleration.

Упражнение 17. Найдите в тексте 1А слова с суффиксами *-tion*, *-al*, *-ic*, *-ly* и переведите их.

Упражнение 18. Найдите глагольные формы, которые могут быть сказуемыми в предложении:

student, many, will be passed, doing, technical, has, reports, studied, interesting, connected, are, were done, large, is, tasks, developed, is read, coming, texts, badly, giving, had, was made possible, are given, forms, necessary, teaches, basis, was, done.

Упражнение 19. Найдите:

а) антонимы (слова, противоположные по значению)

to begin, to enter, young, large, to open, to take, quick, much, to graduate from, many, long, slow, little, to finish, old, small, to close, to give, few, short;

б) синонимы (слова, совпадающие по значению)

new, large, many, to begin, to take, to speak, to enter, to build, to do, to get, modern, big, to start, much, to make, main, to talk, to construct, to come into, major.

Упражнение 20. Составьте предложения из следующих слов в соответствии с порядком слов в английском предложении.

1. has, buildings, our, several, institute. 2. subjects, students, many, the first-year, study. 3. the third-year, had, last, students, training, industrial, summer. 4. carry out, students, practical, work, in, laboratories, well-equipped. 5. problems, many, scien-

tists, important, solve, our. 6. texts, difficult, Petrov, technical, translated. 7. his, will, the teacher, translation, correct. 8. next, dean, a lecture, deliver, our, week, will. 9. students, more, institutes, last, entered, a million, than, year.

Упражнение 21. Заполните пропуски глаголами *to be*, *to have* в соответствующем времени.

1. Moscow ... the capital of Russia. 2. There ... many institutes in Moscow. 3. The oldest of them ... Moscow University. 4. Our University ... one of the oldest technological institutes in this country. 5. It ... founded in 1830. 6. It ... old and new buildings. 7. There ... laboratories, workshops and libraries in our institute. 8. Every faculty ... its own computer center. 9. Our library ... a great number of books and magazines in all branches of science and technology. 10. Last year we ... at school, next year we ... the second year students. 11. We ... industrial training in the third year.

Упражнение 22. Выберите правильную форму.

1. Entrance exams (held, are held) in summer. 2. More than 20 new technological institutes (were founded, founded) in the last decade. 3. Basic engineering subjects (studied, are studied) in the first and second years. 4. Highly-qualified specialists (trained, are trained) at higher schools. 5. More than a million students (enroled, were enroled) to the institutes and universities of this country last summer. 6. The training of specialists (will be improved, will improve) as a result of restructuring in the next few years.

Упражнение 23. Напишите ответы на вопросы по следующему образцу:

Are there two presidents in the United States? No, there are not. There are not two presidents in the United States. There is one president in the United States.

1. Are there thirteen months in a year? 2. Are there eight days in a week? 3. Are there fifty minutes in a hour? 4. Are there seventy seconds in a minute? 5. Are there forty days in a month? 6. Are there thirty days in February? 7. Are there thirty-two days in January? 8. Are there five seasons in a year?

Упражнение 24. Выберите соответствующие местоимения.

A. 1. (We, us) all went with (their, them) to the dean's office. 2. My friend came to see (I, me) last night. 3. Victor gave Peter and (I, me) a book and we went to the reading-room with (he, him) and his friend. 4. He told Mary and (me, I) to go with (he, him) and his

sister. 5. They know all about my friend and (I, me). 6. I came to the Institute with Michael and (her, she). 7. An old man asked (we, us) to come and see (him, his). 8. Go with David and (her, she) to visit (they, them).

B. They invited me to (them, their) party. 2. He could not answer (his, her) teacher. 3. They were (your, you) former students. 4. You are (us, our) colleagues. 5. This is (my, me) brother. 6. Ann went to (his, her) room and put on (his, her) new dress because she was going to a dance given by (his, her) company. 7. Where is the dictionary? (He, it) is in (his, its) place on the table.

C. 1. Your dictionary is new, but (my, mine) is not. 2. She says that this dictionary is (her, hers). 3. You can do it without my help, but not without (theirs, their). 4. Will you help me to sort out the things? I cannot tell which are (your, yours) and which are (our, ours). 5. He is an old friend of (me, mine). 6. Do you know your lesson today? He does not know (him, his). 7. This is your notebook and this is his, but where is (her, hers)?

Упражнение 25. Выразите согласие или несогласие.

1. Do you study at school? 2. Are you a student of the third year? 3. Do you study many subjects? 4. Did you pass your entrance exams well? 5. Do you live in Moscow? 6. Do you live far from the institute? 7. Is English your favourite subject? 8. Will you go to the concert tomorrow? 9. Were your books taken from the library? 10. Do you live in the hostel?

Упражнение 26. Заполните пропуски предлогами *in, at, on, to, into, under, near*.

1. We live ... Moscow. 2. I get up ... seven o'clock and leave ... eight. 3. I usually walk ... the institute. 4. There are three rooms ... our flat. 5. There is a picture ... the wall and a small table ... the picture. 6. He comes ... the room and sits down ... the chair ... the table. 7. ... the evening we watch TV or read books. 8. We do not study... Sunday. 9. There are several newspapers ... the table. 10. The accident happened ... the bridge.

Упражнение 27. Дайте недостающие формы глагола, запомните их.

got, beginning, took, meant, say, becoming, found, brought, going, come

Упражнение 28. Прочитайте и переведите текст без словаря.

As you know higher education trains highly-qualified specialists for further development and progress of the country. The students

making good progress get state grants. The course of study at the universities lasts about six years. The students take three or four years of general engineering and fundamental courses, then one or two years of specialized training in some fields of science and technology. In the first and second years a good foundation for professional knowledge is provided. At present there are many modern laboratories at institutes. Most higher schools have their own computer centers. This means that the state must spend a lot of money to improve higher education.

CONVERSATION

Exercise 1. Answer the questions.

1. How old are you now? 2. Where were you born? 3. What city did you come from? 4. Where did you go to school? 5. What foreign language did you study at school? 6. How long did you study at school? 7. Why did you enter this institute? 8. What are your favourite subjects at the institute? 9. Where do you live? 10. Do you live with your family? 11. How do you usually spend your Saturday and Sunday? 12. What did you do last weekend? 13. What are you going to do next weekend? 14. What is your favourite sport? 15. What is your hobby? 16. Where do you usually spend your summer vacation? 17. When do you usually get up in the morning? 18. At what time do you usually leave home? 19. How do you usually get to the institute?

Exercise 2. Read and learn.

Ted's instructor: Hello Ted. I'm glad I saw you before lectures. Did you know about the change in the examination timetable?

Ted: Change?

Ted's ins.: Yes. The last day of examinations for your group will be January 23rd not January 21st.

Ted: Is that definite (определенно, точно)? We were told they'd be on January 22nd.

Ted's ins.: There can be no changes now. It's definitely January 23rd.

Ted: That's great. I'm going to London on holiday on January 24th.

Ted's ins.: Have you finished your assignment (домашнее задание) yet?

Ted: I'm nearly there. I think I'll give it to you on Tuesday.
Ted's ins.: That's good. I can't let you have another extension (отсрочка).
Ted: I was really grateful for the extra time you gave me. That was a really big assignment.
Ted's ins.: Well, I'll expect it next week. Now, would you like to hear the details of the schedule?
Ted: Oh. Yes, please.
Ted's ins.: You'll have four examinations. General mechanics is in the morning of January 8th, physics is on the afternoon of January 13th, maths is on the morning of January 18th, and information technology in the afternoon of January 23rd.

Mr.R.: Good morning. Have a seat.
Bob: Good morning. Thank you.
Mr. R.: I have your application here. Your name is Robert Smith, right?
B.: That's right, sir.
Mr. R.: And you hope to enter our university this year?
B.: Yes sir, if I can make it.
Mr. R.: Fine, Bob. You finished school a year ago. Why didn't you enter college that year?
B.: Well, I have a sister in college now. And there is another one who'll be going next year. So I need money to pay for my education.
Mr. R.: All right. How were your grades (отметка, оценка) at school?
B.: Well, pretty good. Until my last year I got a little too interested in sports. But I know I'll work hard in college.
Mr. R.: It's hard to keep up both sports and studies.
B.: Yes sir, I know.
Mr. R.: Fine. Well, we'll let you know in about two weeks, good luck (удачи).
B.: Thank you, sir. Goodbye.

Exercise 3. Speak about:

1. My University.
2. Academic Year at My University.
3. I am a first-year student.

Use text «My University» and text 1A for your topic.

Exercise 4. Read and smile:

- Mary: Professor, I think you can speak several languages.
Professor: Yes, I'd say about five.
M.: French, I think? And German?
P.: No, neither. I read them well, but have never learned to speak them.
M.: Italian? Chinese?
P.: No, I am afraid not.
M.: You must be kidding me (обманывать, смеяться).
P.: Not at all. First, there is a language we are using now. Then there is the language I use in the classroom, in my lectures. Next, there is the speech I use when I go back to my home town. And I have another that I use with my little daughter, and still another with my dog. Then there's...
M.: But those are all English.
P.: Yes, of course. You speak differently to every person. Fortunately (к счастью), everybody does all this quite naturally.
-

He was a Rising Star

Max Born, who later became an outstanding German physicist, took an exam in astronomy. He was examined by a professor. Here is their conversation:

- Professor: What do you do when you see a falling star?
Born: I think up of a wish (задумать желание).
P.: Is that all?
B.: Then I take a look at my watch, mark the time and the constellation (созвездие) from which the star appeared, determine the direction of its movement and the length of its path, then go home and calculate the orbit of the star.

The professor asked no more questions. He was satisfied (быть удовлетворенным).

Text 1B

Прочитайте текст. Расскажите об особенностях обучения в Кембриджском университете.

Cambridge

Cambridge is one of the two main universities of England which is located at the Cam River. It was founded at the beginning

of the 12th century. The University consists of (состоит из) 24 different colleges including 4 colleges for women. Each college is self-governing (самоуправляется).

The head of the University is the chancellor who is elected for life. The teachers are commonly called «dons» and «tutors». Part of the teaching is by means of lectures organized by the University. Besides lectures teaching is carried out by tutorial system for which Cambridge University is famous all over the world. This is a system of individual tuition (обучения) organized by the colleges.

Each student has a tutor who practically guides him through the whole course of studies. The tutor plans the student's work and once a week the student goes to his tutor to discuss his work with him. The training course lasts 4 years. The academic year is divided into 3 terms. The students study natural and technical sciences, law, history, languages, geography and many other subjects.

After three years of study a student may proceed (получить ученую степень) to a Bachelor's degree, and later to the degrees of Master and Doctor. Students are required to wear gowns (мантия) at lectures, in the University library, in the street in the evening, for dinners in the colleges and for official visits. All the students must pay for their education, examinations, books, laboratories, university hostel, the use of libraries, etc. Very few students get grants. Not many children from the working class families are able to get higher education, as the cost is high. The cost of education depends on the college and speciality.

A number of great men, well-known scientists and writers studied at Cambridge. Among them are: Erasmus, the great Dutch scholar, Bacon, the philosopher, Milton and Byron, the poets, Cromwell, the soldier, Newton and Darwin, the scientists.

Text 1C

Прочитайте текст. Расскажите об особенностях системы высшего образования в нашей стране и в США.

Higher Education in the USA

There is no national system of higher education in the United States. Higher education is given in colleges and universities. There are over 2100 various higher educational institutions, including colleges, technological institutes and universities. The average college course of study is 4 years. The academic year is usually 9 months or 2 terms (semesters) of four and a half months each. Classes usually begin in September and end in June. The first-year students are called freshmen.

Students choose a major subject (профилирующий предмет, дисциплина) and take many courses in this subject. After four years, they get a traditional Bachelor's degree. Then the students may go on to graduate school (старшие курсы) and with a year or two of further study get a Master's degree.

After another year or two of study and research, they may get a still higher degree as Doctor of Philosophy (Ph. D.). The student's progress is evaluated by means of tests, term works and final examinations in each course. The student's work is given a mark, usually on a five point scale (5-балльная система). Letters indicate the level of achievement. «A» is the highest mark. «F» denotes a failure.

Most American colleges and universities charge for tuition. The methods of instruction in the universities are lectures, discussions, laboratory and course works and seminars.

Most cities have colleges or universities that hold classes at night as well as in daytime. In this way people may work for a degree or just take a course in the subject that interests them.

Text 1D

Прочитайте письмо и напишите ответ.

A Letter

Dear Sergei,

How are you? I have received your letter of 10-th June for which I thank you very much. I am sorry I haven't written to you sooner, but I have had many things to do. You know it was a very hard year for me. I spent my time getting ready for my exams and I was doing well in many subjects. After passing the exams I was enrolled into the University. The whole course of study is four years. My major subject is mathematics. It is my favourite and my hobby. I am good at it and do maths whenever I have a chance. I take many courses in this subject. I like to take part in mathematical competitions organized at our department and at the University. I think that mathematics is «the language of science» and plays an important part in many sciences. We are lucky to have a brilliant lecturer in mathematics this term. He has a talent to take a difficult subject and make it simple. You leave the lecture hall with a feeling that mathematics is the most interesting subject under the sun. Next term I'll do research in the field of computer engineering.

And how do you feel about maths? Please, write to me, I am especially interested in your life in students' hostel.

Good-bye for the present,
your friend Mike

ДОПОЛНИТЕЛЬНЫЕ ЗАДАНИЯ

Упражнение 1. А. Прочитайте текст и постарайтесь догадаться о значении выделенных слов.

Computers are now **essential** in many **areas of life** — modern banking, information technology and many others. However, this is not true for education.

There are some subjects which may be better taught using computers. Elementary mathematics, elementary language learning, any subject that requires a student to **memorize** basic facts through repetition (повторение) is good to computer learning. The computer can be programmed to provide an endless number of simple questions, and as the student answers these questions the facts are learned.

However, in the learning and practice of more complex ideas, the computer is not **adequate**. A computer can evaluate (оценить) an answer as right or wrong, but it cannot determine why. It cannot find out why a student is making mistakes, and then explain important **concepts** in a different way so the student will understand. Task connected with explanation cannot be taught by computers as there are too many **variables** for a computer to deal with successfully.

Thus, while computers may be useful for practising simple skills, they are not an essential feature of modern education. Until further developments in computers are made, the human teacher will remain **indispensable**.

В. Подберите к каждому слову или словосочетанию в колонке А соответствующее из колонки В.

А

1. essential
2. area of life
3. memorize
4. adequate
5. concept
6. variable
7. indispensable

В

- a. thing that can vary
- b. idea, opinion
- c. absolutely necessary
- d. most important
- e. sphere of activity
- f. learn by heart
- g. satisfactory, sufficient

С. Заполните пропуски антонимами и синонимами.

right ...
... complex
adequate ...

... new, up-to-date
most important ...
... absolutely necessary

Упражнение 2. Составьте возможные словосочетания глаголов из колонки А с существительными из колонки В.

A	B
1. go to/enter/be enrolled into/graduate from	a. progress
2. read for/take/pass	b. a course in, notes
3. do/study	c. good at Maths
4. take/make	d. research into/on
5. get/receive	e. university
6. make	f. a subject, a course, for a degree
7. be	g. in discussion, competition on
8. take part	h. grant, degree
9. do/conduct/carry out	i. examinations (exams)
10. give/do	j. a lecture

Упражнение 3. Замените в каждом предложении выделенный глагол на другой глагол с тем же значением.

1. Did you **receive** a grant? 2. How many exams did you pass before you **entered** university? 3. Do you **take** notes in lectures? 4. Who **gives** the lecture in history? 5. My friend **studies** physics. 6. What research did you **conduct** last semester?

Упражнение 4. Заполните таблицы на словообразование.

Verb	Noun
Instruct	...
...	foundation
Inform	...
...	determination
Consider	...
...	preparation
Introduce	...

Verb	Noun	Adjective
Educate	...	...
Occupy	...	...
Base	...	...

Упражнение 5. А. Назовите 10–15 ключевых слов и словосочетаний на тему «Higher Education».

В. Speak about:
Computers in education.

LESSON 2

Времена группы *Continuous Active, Passive*

Функции *it, one, that*

Степени сравнения прилагательных

Суффиксы *-ment, -ty, -ous*

Префикс *re-*

Text 2A. *Environment Protection must be Global*

Text 2B. *Pollution*

Text 2C. *Ecological Problems of Big Cities*

Text 2D. *London, its History and Development*

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

Упражнение 1. Объясните употребление времен группы *Continuous*, переведите предложения.

A. 1. I am at my English lesson. I am sitting and doing my exercises. My friend is not sitting, he is standing at the blackboard and looking at me. 2. It is getting cold now, isn't it? Look out. Is it raining now? 3. You are late. What were you doing? — I was translating a text. 4. When I came home my parents were having supper and at the same time they were watching TV. 5. What was he doing when I rang up an hour ago? He was looking through a newspaper when I rang up. 6. Tomorrow we shall be preparing for a test for the whole evening. 7. In July they will be taking their exams for the whole month. 8. What will you be doing tonight at 10 o'clock? Will you be working? No, I shall be reading a book at this hour.

B. 1. New Metro lines are being built now in Moscow. 2. What is going on? A new film is being discussed. 3. What grammar was being explained when you came in? 4. What questions were being

discussed at that time? 5. New methods of research are being used in our lab. 6. Much is being done to improve laboratory methods.

Упражнение 2. Выберите правильную форму глагола.

1. We (are translating, translate) a technical text now. 2. We usually (are not translating, do not translate) stories. 3. She (does not look, is not looking) through all the newspapers every evening. 4. He (looked, was looking) through a newspaper when the telephone rang. 5. What (were, was) you doing a minute ago? I (was watching, watched) television. 6. I (watch, am watching) television every day. 7. I had a late night, I (worked, was working) until midnight. 8. Yesterday he (worked, was working) a lot. 9. The students (had, were having) an interesting discussion when the teacher came in. 10. The students often (have, are having) interesting discussions after lectures. 11. When he comes they (will be taking, will take) a test. 12. They (will be taking, will take) a test next week. 13. Where is Ann? She is in the coffee shop. She (has, is having) a cup of coffee. She always (has, is having) a cup of coffee in the evening.

Упражнение 3. Поставьте глагол в соответствующем времени в зависимости от обстоятельства.

This student (study) physics (at present, every day, last semester, when the telephone rang, tomorrow at this time, next semester).

Упражнение 4. Переведите предложения.

1. Сейчас у нас урок английского языка. Преподаватель стоит у доски и объясняет новую грамматику. Студенты внимательно слушают и записывают. 2. Где вы были вчера после обеда? Я был дома весь день. Я писал письмо друзьям. 3. Что ты делал пять минут назад? 4. На нашей улице произошел несчастный случай (accident). Я смотрел в окно, когда он произошел. 5. Что будет делать твоя сестра в 8 часов вечера? Она будет выполнять домашнее задание. 6. Какие вопросы будут обсуждаться сегодня на собрании? — Приходите в 12 часов. Будет обсуждаться очень интересный вопрос. 7. Когда мы приехали в город, там строился новый спортклуб.

Упражнение 5. Переведите предложения с *it* в различных функциях.

1. It is autumn. It is the 3rd of October. It is dark in the morning and it is difficult to get up. 2. It is a new subject. It is very important for our future speciality. We shall study it for two years. It will be our future speciality, but we do not know much about it in

the first year. 3. It is known that the knowledge of general engineering subjects is the basis for the study of special subjects. 4. It seems that he works a lot. 5. It is said that the chemistry laboratory of our institute is good. 6. The student finds it difficult to translate such a text without a dictionary. 7. It was not easy to study at the institute. 8. It is important to understand the fundamentals of this science. 9. It was A.S. Popov who invented the radio. 10. It is the knowledge of general engineering subjects that is the basis of engineering training.

Упражнение 6. Переведите предложения с *one* в различных функциях.

1. One must study a lot to become an engineer. 2. We must write only one exercise now. 3. Engineer is one of the most important professions, it is the one that is taught at technical institutes. 4. One cannot translate such an article without a dictionary in the first year. 5. One must have a very good knowledge of general engineering subjects to become a good engineer. 6. One must pass all exams well to enter an institute. 7. Last summer I read many English articles, and my friend read some German ones. 8. This summer we shall spend in the country, the last one we spent in the city. 9. We translated many texts, but there is one more text to translate. 10. One can take this journal from the library.

Упражнение 7. Переведите предложения с *that* в различных функциях.

1. That student studies in our group. 2. Do you know those girls? They are from our institute. 3. The professor that lectures on mechanics is the dean of our faculty. 4. It is known that the knowledge of general engineering subjects is the basis for the study of special subjects. 5. We know that the study of general engineering subjects is necessary for future engineers. 6. That higher education in this country is excellent is known to everybody. 7. The aim of today's foreign policy is that peace in the world should be permanent. 8. The programme for the first-year students differs from that of the third-year students. 9. There are many interesting articles in this journal, read those on your speciality. 10. It is the high qualification of future specialists that will determine the scientific and technological progress of any country.

Упражнение 8. Дайте недостающие степени сравнения.

(the) biggest, longer, faster, (the) hardest, (the) heaviest, thinner, narrower, lower, (the) greatest, newer, colder, (the) hottest, (the) shortest, less, (the) worst, more.

Упражнение 9. Поставьте прилагательные в сравнительной или превосходной степени.

1. Moscow University is (large) University in Europe. 2. Strength of materials is (difficult) than chemistry. 3. Is it (interesting) to study at the institute than at school? 4. My friend works (hard) at his English than I. 5. My brother is (old) than I but he is (short). 6. The University is one of the (tall) buildings in Moscow. 7. Days in summer are (long) than in winter. 8. This group studies (good) than that one. 9. Oxford is (old) University in Britain.

Упражнение 10. Ответьте на следующие вопросы.

1. Which is the most difficult subject for you? 2. Which is the easiest subject? 3. Which of the subjects is more difficult: physics or mathematics? 4. Who is the tallest in your group? 5. Which is the most interesting subject for you? 6. Is English as difficult as mathematics?

Упражнение 11. Заполните пропуски словами *than, as ... as, not so ... as*.

1. In winter days are ... long ... in summer. 2. Chemistry is... difficult ... physics. 3. I study English ... long ... my friend. 4. My sister is older ... I. 5. English is ... so difficult ... mathematics. 6. Moscow is bigger ... Tallinn. 7. This machine is ... old ... that one. 8. The new transistor is more powerful ... the old one. 9. The task of school education is ... important ... that of higher education. 10. John is ... tall ... his brother, but he is ... tall ... his father.

Упражнение 12. Переведите обороты в сравнительной степени согласно образцу:

The longer the nights, the shorter the days.
Чем длиннее ночи, тем короче дни.

1. The harder we study, the more we know. 2. The more you work, the better you know English. 3. The more we study nature, the more we know about it. 4. The nearer the earth is, the denser the atmosphere is. 5. The stronger the wind, the harder the conditions of work for weather observers. 6. The quicker we finish, the sooner we will go home.

Упражнение 13. Найдите в каждом ряду прилагательные в сравнительной степени и переведите их.

teacher, taller, thermometer, thinker
worker, weather, worse, writer
bomber, brother, brighter, barometer

darker, driver, denser, dancer
bigger, best, builder, better
father, farther, foreigner, faster
earlier, easier, eater, engineer
compressor, computer, colder, closer
meter, mover, more, motor

СЛОВООБРАЗОВАНИЕ

Упражнение 14. Переведите следующие производные слова согласно образцу:

глагол + -ment = существительное

to environ — окружать → environment — окружение

to enrol — enrolment, to develop — development, to achieve — achievement, to move — movement;

прилагательное + -(i)ty = существительное

communal-общинный → community — общность, содружество

social — общественный → society — общество

active — activity, special — speciality, national — nationality, intensive — intensity, electric — electricity;

существительное + -ous = прилагательное

fame — слава, известность → famous — знаменитый, известный

variety — various, number — numerous, monotony — monotonous;

префикс re- (повторность действия)

renew — обновлять, восстанавливать

renewal — восстановление

renewable — восстанавливаемый, восстанавливающийся

rebuild, remake, reuse, reorganize, reorganization.

Упражнение 15. Прочитайте и переведите интернациональные слова:

global ['gləʊbl], resources [rɪ'sɔ:sɪz], problem ['prɒbləm], ecology [ɪ'kɒlədʒɪ], proportion [prə'pɔ:ʃən], era ['ɪərə], territory ['terɪtəri], ocean ['əʊʃən], oceanic [ˌəʊʃɪ'ænik], situation [ˌsɪtju'eɪʃən], atmosphere ['ætməsfɪə], process ['prəʊses], cli-

mate ['klaɪmɪt], balance ['bæləns], experiment [ɪks'perɪmənt], social ['səʊʃəl].

Упражнение 16. Прочитайте и запомните произношение слов.

environment [ɪn'vaɪərənmənt], pollution [pə'lu:ʃən], achieve [ə'tʃi:v], success [sək'ses], successful [sək'sesfəl], successfully [sək'sesfəlɪ], purify ['pjʊərɪfaɪ], air [ɛə], natural ['nætʃrəl], however [haʊ'evə], job [dʒɒb], remain [rɪ'meɪn], mankind [mæn'kaɪnd], reach [ri:tʃ], special ['speʃəl], especially [ɪs'peʃəlɪ], serious ['sɪəriəs], throughout [θru'au], world [wə:ld], knowledge ['nɒlɪdʒ], advance [əd'vɑ:ns], eliminate [ɪ'limɪneɪt], purpose ['pə:pəs], scale [skeɪl], weather ['weðə], essential [ɪ'senʃəl], therefore ['ðeəfɔ:], data ['deɪtə], joint [dʒɔɪnt], measure ['meɪʒə], realize ['rɪəlaɪz], circumstance ['sə:kəmstəns].

СЛОВА И СЛОВСОЧЕТАНИЯ ДЛЯ ЗАПОМИНАНИЯ

achieve *v* — достигать
advance *n* — продвижение
вперед, успех, прогресс
area *n* — область
bring about *v* — вызывать
carry out *v* — проводить, выполнять
change *v* — менять(ся), изменять(ся); *n* — изменение, перемена
considerable *a* — значительный
deal with *v* — иметь дело с
effort *n* — усилие
evident *a* — очевидный
growth *n* — рост
however *adv* — однако, тем не менее

increase *v* — увеличиваться
level *n* — уровень
purpose *n* — цель, назначение
reach *v* — достигать
realize *v* — понимать, отчетливо представлять
remain *v* — оставаться
scale *n* — масштаб, размер
several *a* — несколько
similar *a* — подобный, схожий
solve *v* — решать
still *adv* — все еще, однако
success *n* — успех
therefore *adv* — поэтому
way *n* — путь, дорога; способ

joint efforts — совместные усилия
take measures — принимать меры
throughout the world — по всему миру

Текст 2А

Прочитайте текст и ответьте, какие меры необходимы для успешного решения проблемы защиты окружающей среды в глобальном масштабе. Переведите.

Environment Protection Must Be Global

That the problem of pollution and ecology has become the most important one for mankind is evident to all. The more civilization is developing, the greater the ecological problems are becoming. Air and water pollution by industry is now reaching tremendous proportions. In our era it is changing from a national to an international problem, especially in territories where rivers cross several countries. The seas and oceans are also becoming seriously polluted. A similar situation is developing in the atmosphere. It is known that many cities throughout the world suffer from air pollution.

However, our scientific knowledge and technological advancement make it possible to eliminate it if people use good will¹ and make considerable investments for that purpose. The development of natural resources on a global scale is already possible from a scientific and technical standpoint². Large-scale experimental work in this area is successfully being carried out.

At present scientists in industrially developed countries are working on the theory of interaction of all the atmospheric and oceanic global processes that determine the climate and weather of the world. Increasing growth of population, industrialization and the use of resources are slowly but surely changing the global climate and water balance. This can be described as a great experiment, one that may bring about changes in the environment more serious than ever before.

The essential feature in the environment protection is that many problems can be solved only on the level of world community³. Therefore, the planning of protection against pollution by human society as a whole⁴ is imperative today and in the near future. It is necessary to develop an international program to study data on land, forest, atmospheric and oceanic resources, both renewable and non-renewable. It is the joint efforts of many scientists and special public organizations that can deal with the problem and take necessary measures to protect the environment.

It is still a big job and much remains to be done⁵. However, scientists are confident that planned actions of all countries can eliminate pollution and achieve successes in purifying air, water and soil and in safeguarding natural resources. At the same time one must

realize that social and political circumstances may stand in the way of further progress in this field.

Notes to the Text

1. good will — добрая воля
2. standpoint — точка зрения
3. community — сообщество
4. as a whole — в целом
5. much remains to be done — еще многое предстоит (остается) сделать

УПРАЖНЕНИЯ

Упражнение 17. Просмотрите текст 2А и ответьте на вопросы.

1. What is this text about? 2. What is ecology? 3. How does water (air) become polluted? 4. Why is the problem of water pollution becoming a global problem?

Упражнение 18. Найдите предложения с глаголом-сказуемым в Present Continuous, переведите.

1. Water and air are becoming more and more polluted. 2. At present computers are more widely used in the sphere of education. 3. Where were you at six o'clock? We were studying in the reading-room. 4. There are government and public organizations that are analysing data on land, forest and air. 5. New courses of education such as management are being organized in many institutes. 6. What will you be doing in the laboratory tomorrow morning? We shall be watching the operation of a new device. 7. Measures are being taken to save Lake Baikal. 8. The situation at Lake Baikal is remaining very serious. 9. Much attention is being paid at present to the development of international scientific contacts. 10. Science is becoming a leading factor in the progress of mankind.

Упражнение 19. А. Найдите предложения с глаголом-сказуемым в Continuous Passive, переведите.

1. Cambridge University was formed in the 12th century. 2. The solution of ecological problems may be achieved only by joint efforts of all countries. 3. Great changes in people's lives and work were brought about by the scientific and technological progress. 4. The theory of interaction of atmospheric and oceanic processes is being developed to determine the weather of the planet. 5. The teachers at Cambridge are called «dons» or «tutors». 6. Computers and la-

sers are being widely introduced at plants and factories. 7. The most important ecological problems must be considered at the government level. 8. The training at Cambridge and Oxford is carried out by tutorial system.

В. Переделайте предложения из действительного в страдательный залог.

1. He is writing a letter at the moment. 2. John was preparing report all day yesterday. 3. We are learning grammar now. 4. At present mankind is making considerable investments to eliminate air pollution. 5. Today the changes in the global climate and water balance are bringing about serious changes in the environment. 6. Many scientists are constantly carrying out experimental work to solve the problem of environment protection. 7. The company is making plans for the future.

Упражнение 20. Найдите предложения, где *it* является формальным подлежащим, личным местоимением или входит в состав усилительной конструкции; переведите.

1. It is dark here. Please, turn on the light. 2. It was Gagarin who was the first man to orbit the Earth. 3. Our students study strength of materials. It is a very difficult subject. 4. Mathematics is studied at all technological institutes because every engineer must know it well. 5. It is the most interesting article on this subject. 6. It has become evident that ecological problems can be solved only on the global level. 7. Joint efforts of people throughout the world make it possible to achieve some progress in environment protection. 8. It is the development of robots that will solve some very complex problems of industry. 9. It is evident that research is becoming more specialized now. 10. The use of the new equipment made it possible to minimize the number of workers. 11. It is industrialization that is making ecological problems very serious.

Упражнение 21. Определите функции *one* и *that*, переведите предложения.

1. The problem that has become the most important one is the problem of pollution. 2. One can easily understand why the profession of an engineer requires a special college training 3. The new technologies that are being developed must be connected with traditional ones. 4. That air and water pollution by industrialization is reaching dangerous levels is realized by everyone. 5. It is the invention of an engine that started the first industrial revolution. 6. The main purpose of education is that graduates must be able to work

with the technology of tomorrow. 7. The education in Oxford and Cambridge is different in many ways from that in other universities. 8. We discussed the first industrial revolution, the one that took place some centuries ago. 9. New robots will have several manipulators that will carry out many functions. 10. That computers and robots are important for industrial uses is well known to scientists and engineers. 11. One must realize that the increasing number of cars brings about considerable pollution of the air. 12. It is the growth of industrialization that is changing the climate of the planet. 13. The essential feature of higher education in this country is that it combines theory with practice. 14. The simplest materials are those which have only one kind of atoms. 15. That the Earth is round was unknown for a long time. 16. It is found that the labour (труд) of a man with secondary education is 108 per cent more efficient than that of a man without that education. Moreover, the work of a university or college graduate is 300 per cent more efficient than that of a specialist with secondary education.

Упражнение 22. Переведите предложения с союзами сравнения.

1. The bigger the cities are, the greater the pollution is. 2. The more computers and robots are used in industry, the quicker technological progress will be. 3. The more automobiles appear in the streets, the worse the air in the cities is. 4. The more effective is the technology, the quicker is the development of this country. 5. The quicker we joint our efforts in protecting the environment, the quicker the ecological problems are solved.

УПРАЖНЕНИЯ ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ

Упражнение 23. Определите по суффиксу, к какой части речи относятся слова.

radioactivity, measurement, interaction, society, nervous, elimination, basic, proportion, seriously, symbolic, anxious, ecological.

Упражнение 24. Назовите глаголы, образованные от следующих существительных, и переведите их.

advancement (продвижение вперед, прогресс), investment (капиталовложение), measurement (измерение), achievement (достижение), improvement (улучшение), fulfillment (выполнение).

Упражнение 25. Переведите слова с префиксом *re-*.

rename, reopen, renew, renewable, non-renewable, renewal.

Упражнение 26. Найдите среди следующих слов:

а) антонимы

slowly, old, at present, small, quickly, in the past, new, large;

б) синонимы

tremendous, epoch, realize, several, work, progress, great, field, era, understand, make it possible, different, achieve, some, advance, enable, area, various, reach, essential, job, important.

Упражнение 27. Составьте предложения, пользуясь словами и выражениями из таблицы.

Her friend	are watching	a letter
They	is writing	on the telephone
I	are listening to	the latest news on the radio
You	am reading	the TV programme
We	is speaking	an exercise

Упражнение 28. Придумайте предложения со следующими глаголами-сказуемыми:

is changing, was changing, will be changing, are becoming, will be developing, are being introduced, was being solved.

Упражнение 29. Раскройте скобки.

A. When Peter was a child, he had two drawing books. One of them was (large) than the other. His elder brother bought the (large) one for him. Peter liked it (well) because the drawings in it were (large) and simple. He drew something every day. Each new day his drawing was (good) than the one he had made the day before. The last page was much (good) than the first one.

B. After graduating from the institute Mike went to Siberia to a small industrial town. It was (difficult) for him to begin his work as an engineer than he thought that it would be. He moved to (important) city than the first one. He was not (successful) there than before, however, and sometimes he was even (unhappy). However, he was (happy) about one thing, he was becoming a (useful) specialist.

C. New York is the (large) city in the US. Perhaps, with all its suburbs (пригород), it is the (large) city in the world. It is one of

the (important) industrial cities in the country. Some of the (old) and historic buildings are there. Some of the buildings in New York City are the (high) buildings in the whole world. New York City is not only the (large) city in the US; it is also the (important) industrial center. Perhaps, the (expensive) office buildings in the world are there. It has the (great) number of factories, the (large) banks and post offices. It sends out many letters and receives the (heavy) mail bags. It is truly the (important) business city.

Упражнение 30. Прочитайте текст и озаглавьте его.

The highest mountain in the world is Mount Everest — 29,002 feet high. The largest ocean is the Pacific having a total area of 63,986,000 square miles. The Atlantic Ocean, the next largest, is only 31,530,000 square miles, the Indian Ocean with 28,350,000 square miles comes third. The longest river is the Nile which is more than 4,000 miles longer or about twice the distance by air from London to Beirut. The biggest island is Greenland which belongs to Denmark and is about 840,000 square miles in extent. The largest lake is the Caspian Sea. Geographers consider it as a lake because it is not connected with any of the great oceans. It has an area of about 170,000 square miles. Which is the deepest sea? So far, as we know at present the greatest depth is in the Pacific Ocean near the Philippines and goes down to 37,000 feet, which is much more than the height of Everest. The biggest volcano is in Ecuador, South America. It is still active and 19,612 feet high. There is another one between Argentina and Chile and it is more than 3,000 feet higher.

Упражнение 31. Напишите существительные в единственном числе.

cities, countries, societies, universities, technologies, lorries, industries, dictionaries, territories, theories, communities.

Упражнение 32. Дайте недостающие формы глаголов, запомните их.

grown, stand, dealing, brought, knew, making, send, found, thought, spending.

Упражнение 33. Прочитайте и переведите текст без словаря.

It is difficult for mankind to predict (предсказать) changes in the environment accurately. It is known that natural changes in weather and climate may have more catastrophic global effects than human activity. But scientists are developing a new concept

that can help make such prediction more accurately. It is based on our understanding that the Earth is an integral system. Its parts — oceans, atmosphere, land or life — cannot be understood in isolation to predict changes in the most accurate way. Modern scientific and technological progress made it possible to use new technologies for that purpose. That satellites can control physical, chemical, biological and geological changes on a global scale is well-known now. One must also know that the study of environmental problems with the help of satellites is becoming international. Russia, the US, France, Japan, Canada, India, China and Italy are planning to send their satellites in both polar and geostationary orbits.

CONVERSATION

Exercise 1. Answer the questions according to the example:

What is one of the most important problems for mankind now? (the problem of pollution and ecology).

The problem of pollution and ecology is one of the most important problems for mankind now.

1. What problem is becoming a global problem? (the problem of air and water pollution). 2. What makes it possible to eliminate air and water pollution? (scientific knowledge and technological advance, good will and large investments). 3. What are scientists in industrially developed countries currently working on? (the theory of interaction of the atmospheric and oceanic global processes). 4. What factors are slowly changing the global climate and water balance? (the growth of population, industrialization and use of resources). 5. What actions are necessary to take to deal successfully with the problem of protecting the environment throughout the world? (planning, developing international programs to study ecological data, joint efforts of scientists and special public organizations).

Exercise 2. Make a sentence out of the two parts.

1. At present one of the most important problems for mankind	1. are becoming seriously polluted by industry.
2. The rivers, seas and oceans	2. are successfully being carried out on a global scale.
3. That purifying air, water and soil is changing from a national to a global problem	3. it is possible to eliminate air and water pollution by planned actions of human society as a whole.

4. Therefore, it is necessary

5. Scientists expect that

6. Large-scale experiments in this area

4. is evident to all.

5. to take measures to safeguard natural resources and the environment on a global scale.

6. is that air and water pollution is reaching very large proportions.

Exercise 3. Read and learn.

Rita: Did you have a nice weekend?

Mary: Yes, I did. I was tired of watching television, going to parties, to the movies and so on. John and I decided to go to Pennsylvania University to take part in the discussion on environmental problems.

R.: Oh, really! How unusual! That must have been interesting.

M.: Yes, it was. There were a lot of scientists and politicians. Have you heard about such a firm called «Sanyo»?

R.: Certainly. It is well known for its electronics.

M.: It's one of the first companies to make products that don't pollute the environment.

R.: Oh, my father told us about new heating systems made by this company. They use clean and safe technology.

Exercise 4. Speak about:

1. The problem of pollution and ecology is one of the most important problems for mankind.

2. Ecological problems in your home town, especially the problem of air pollution.

Use exercise 1, 2 and the following words and word combinations for your topic: to become polluted by industry and transport; to reach high level; to develop a program of purifying air in industrial centers; to take necessary measures; for eliminating pollution; new technologies; make it possible; successfully.

Exercise 5. Read and smile.

One evening Rutherford entered the laboratory. It was late, but he found one of his students working with some apparatus.

«What are you doing here so late?» Rutherford asked.

«I'm working, sir,» was the answer.

«And what do you do in the day time?»

«Oh, I work, of course, sir,» answered the student.

«Do you work early in the morning, too?»

«Yes, professor, I work early in the morning, too,» said the student, quite sure that the famous scientist would praise (хвалить) him.

Rutherford looked at him gloomily (мрачно).

«Tell me,» he asked with irritation (раздражение), «when do you think?»

Text 2B

Прочитайте текст. Укажите отрицательные стороны научно-технического прогресса. Приведите примеры экологической ситуации в Вашем городе.

Pollution

The British, like many other Europeans, are becoming more and more worried (беспокоиться) about their environment. Here are some of the environmental problems that they face.

As the population of large cities like London, Birmingham and Manchester continues to grow, pollution problems become worse.

The air in many towns and cities is being polluted by traffic (транспорт, движение) and industry. The number of cars and lorries is growing all the time. On the one hand, they bring mobility to millions of people, but on the other hand, they need bigger, better and more expensive roads, which often ruin the countryside (сельская местность). Traffic in cities is getting worse and worse. Water pollution has become a serious problem in many British rivers. People living near airports suffer from the noise of increasingly larger and more powerful jet airliners taking off and landing.

Text 2C

Прочитайте текст. Расскажите по-английски о результатах исследования, проведенного Всемирной организацией здравоохранения.

Ecological Problems of Big Cities

There are over 150 supercities in the world with population from one to 15 million and more. Tokyo, New York, London, Mexico City, Rio de Janeiro and Moscow are just a few of the cities which have become supercities.

People in the supercities suffer from polluted environment: bad water, bad air and noise. A new term, urban (городской) climate, is used now for such cities. It means high temperature, oppressive atmosphere and intensive smog.

Some experts consider that it is practically impossible to protect the big cities from pollution. The World Health Organization (WHO) studied air pollution around the world for over eight years.

It measured two things: the level of sulphur dioxide (SO₂) in the air and the level of smoke. Sulphur dioxide and smoke pollute water and have serious effect on forest, buildings and health of people.

In the WHO report it is shown that the cities with the most considerable level of CO₂ in the air are Milan, Teheran, Prague, Santiago and São Paulo. However, some cities with clean air get worse in winter. Helsinki, for example, becomes one of the cities with the largest proportion of it in the air in winter. This must be connected with the heating of houses. One can also mention (упоминать) Glasgow and Warsaw which suffer in the same way.

Text 2D

Прочитайте текст. Расскажите по-английски о достопримечательностях современного Лондона.

London, its History and Development

It is known that the area around London was inhabited (населять) by the Celts. Later the Romans founded a military camp there. The camp developed into a port. The area of about 1 square mile where the Romans built their fortifications corresponds approximately to today present City of London. London was the capital of one of the Roman provinces of Britain. After the Romans left Britain, London became less important and suffered greatly from the Danes and Vikings. It was under Henry the First in the 12th century that London finally became the capital of England. In the 16th century London, with its 500,000 inhabitants, was the largest city in England. Under Queen Elizabeth the First in the 17th century England dominated the oceans and became the Empire. It is in the Elizabethan Age that art, culture and literature flowered, especially in London. Over the centuries London became the centre of a constantly growing empire. The empire reached its apex (вершина) under Queen Victoria. Industrialization and the expansion of international trade brought London power, growth and cultural and economic development. In the First and Second World Wars London was ruined considerably.

Some 9 million people now live in London and its suburbs, and the city covers an area of 620 square miles, making it one of the largest of the world's capitals. One reason for its size is that the English people like to live in small houses and have small gardens. As a result, less than 5,000 people live in the City of London, while

more than half a million come here to work in the daytime. Today London is the capital of Great Britain and is also the seat of the Royal Family, the Parliament, the major administrative bodies and scientific institutions.

The Houses of Parliament stand on the bank of the Thames at Westminster Abbey. Actually it is one building but it is called «Houses» as it consists of two chambers: the House of Lords and the House of Commons. It was set up in the 13-th century. At one end of the Houses of Parliament there is a tower with a large clock. The largest bell, known as Big Ben, chimes in (отбивать часы) the hour.

Westminster Abbey was a monastery built in the 8th century. It is one of the best examples of the Early English architecture. The kings and queens of England are buried there. Many great statesmen, writers and poets are also buried there.

In the centre of London there is one of the most beautiful squares — Trafalgar Square which was named so to commemorate (в честь) Nelson's victory in the battle of Trafalgar. There is the monument in its centre known as Nelson's Column.

In the vicinity of Trafalgar Square is Whitehall which is now a street of government offices. Not far from Whitehall is Downing Street. Number 10 Downing Street is the residence of the Prime Minister of England. The Cabinet meets there. One must mention the British Museum. It is one of the most extensive and valuable museums in West Europe, It was founded in 1753. It also comprises the National Library. There are other numerous museums and galleries displaying interesting finds from all parts of the world and from all stages in the development of nature, man and art. There are also two large opera houses, the National Theatre and 50 other theatres. Monuments of past greatness are everywhere in London.

ДОПОЛНИТЕЛЬНЫЕ ЗАДАНИЯ

Упражнение 1. А. Прочитайте следующие словосочетания из текста 2А и постарайтесь догадаться о значении выделенных слов.

1. **to protect** the environment
2. become **seriously** polluted
3. **suffer** from pollution
4. **interaction** of all processes
5. the **essential** feature

6. protection is **imperative** today
7. **public** organizations
8. **safeguarding** natural resources

В. Подберите к каждому слову в колонке А соответствующее значение из колонки В.

A	B
1. protect	a. do not feel well
2. serious	b. for all people
3. suffer	c. keep safe from smth.
4. interaction	d. protection
5. essential	e. needing attention
6. imperative	f. important
7. public	g. necessary, most important, fundamental
8. safeguarding	h. action on each other

Упражнение 2. А. Прочитайте текст и постарайтесь догадаться о значении выделенных слов.

One of the most **urgent** environmental problems in the world today is the shortage of clean water. **Access** to clean drinking water is a basic human need. But industrial pollution has made many sources of water undrinkable. Rivers, lakes and even seas have become **poisonous**.

Lake Baikal is one of the world's largest and most beautiful lakes. Russians call it the Holy Sea. It contains a rich variety of animals and **plants**, including 1,300 **rare species** that do not exist anywhere else in the world. However, they are being destroyed by the massive industrial **effluent**, which some factories still **pour** into the lake every day.

A few years ago, people thought that the supply of clean water was limitless. Now clean water is **scarce**, and we are beginning to **respect** this **precious** resource. We must protect the clean water that remains for the **sake** of our children and grandchildren.

В. Подберите к каждому слову в колонке А соответствующее из колонки В.

A	B
1. urgent	a. group, sort, kind of
2. access	b. in the interest of
3. poisonous	c. unusual, not often seen
4. plant	d. of great value (price)
5. rare	e. needing action

6. species
7. destroy
8. effluent
9. pour
10. scarce
11. respect
12. precious
13. sake

f. not available, not equal to the demand
g. come freely, flow in a continuous stream
h. way (road) to, means of using
i. think about, pay attention to
j. living organism the kind smaller than trees
k. break, put an end to
l. harmful, causing death
m. waste from a factory

Упражнение 3. Заполните таблицы на словообразование.

Noun	Verb	Noun	Adjective
change	...	variety	...
...	achieve	ecology	...
...	advance	environment	...
development	...	danger	...
...	protect	industry	...
...	pollute	globe	...
action	...	nature	...
...	increase	...	safe
elimination	...	...	numerous
...	interact	ocean	...

Упражнение 4. Заполните пропуски словами *global, environmental, pollute, dangerous, scale, environment, protection, resources, increase*.

People are worried about the (1) ... (the air, water, and land around us) as a result of the (2) ... effects of human activity. «Developments» that are making our life more comfortable such as industrialization, urbanization and the use of cars all (3) ... the earth’s atmosphere. There are some of the (4) ... problems today: the ozone layer, (5) ... warming (an (6) ... in world temperature), the conservation and (7) ... of nature and natural (8) ... on a global (9) ...

Упражнение 5. А. Назовите 10–15 ключевых слов и словосочетаний на тему «Environment protection».

В. Speak about:
 The problem of clean water in your town.

LESSON 3

Времена группы *Perfect Active, Passive*

Подлежащее, сказуемое

Суффиксы *-er/-or, -ant/-ent*

Префиксы *un-/im-*

Text 3A. *Electricity*

Text 3B. *A Great Citizen of the World*

Text 3C. *Solar Light by Night*

Text 3D. *Non-traditional Renewable Sources of Energy*

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

Упражнение 1. Объясните употребление времен группы Perfect, переведите.

1. This is a very good book, I have just read it with pleasure. 2. He has been absent this week. He has been ill. 3. I haven't seen you for a long time. Where have you been all this time? 4. We haven't heard about her since 1989. 5. By the beginning of the lecture the laboratory assistant had brought all the necessary diagrams. 6. Before we came to the next lecture we had studied the material of the first one. 7. Have you already finished your diploma work? No, I shall have finished it by the end of June. 8. They will not have passed their exams by the time you return. 9. Many students have been enroled into universities this year. 10. The translation has not been finished yet. It will have been finished by the end of the month. 11. Have you brought these journals with you? No, these journals had been brought by my sister before I returned from St.Petersburg. Don't you know that?

Упражнение 2. А. Выберите правильную форму сказуемого.

1. He (has graduated, graduated) from MSTU named after Bauman this year. He (graduated, will have graduated) from MSTU

named after Bauman in 6 years. 2. She (saw, has seen) us in the morning yesterday. She (saw, has seen) us this morning. 3. I (have met, met) him last year. I never (had met, have met) him before. 4. Our group (will do, will have done) a lab work tomorrow. 5. This problem (is discussed, has been discussed) much in the press lately. This problem (was discussed, had been discussed) yesterday.

В. Переделайте предложения из действительного в страдательный залог.

1. The students have done their homework very well. 2. Bob has left his notebook at home. 3. I have told you about a lecture. 4. The laboratory assistant had prepared the experiment by 2 o'clock. 5. She had finished her test when we came. 6. The teacher will have corrected our dictation by the end of the week. 7. They have not made any mistakes.

Упражнение 3. Переведите предложения.

1. Что вы сделали сегодня? — Я напечатала (to type) много писем. — Я хочу посмотреть письмо к мистеру Д. — Вот, пожалуйста. Я только что напечатала его. — А письмо к мистеру Р.? — Я еще не напечатала это письмо. Я напечатаю его к концу рабочего дня. 2. Вчера мы встретили наших друзей. Мы не видели их с окончания университета. До возвращения в Москву они работали в Орле. 3. Новый завод будет построен к началу следующего года. Он будет оснащен самым современным оборудованием.

Упражнение 4. Прочитайте и объясните употребление времен.

At the Institute

Vera: Hello, Mike! What are you doing here?

Mike: Hello, Vera! I am reading for my mathematics exam.

V.: But your group has passed it already, hasn't it?

M.: Yes, it has, but I was absent at this time. So I'll take this exam tomorrow.

V.: Is it difficult for you to take this exam?

M.: No, it is not. I have finished a specialized mathematical school where mathematics was studied more thoroughly (тщательно) than at other schools. Besides, I have taken part in a mathematics contest of our city.

V.: Really? Have you? When was it?

M.: It was last year.

V.: Were you the first at this contest?

- M.: No, I was the second. The first one was the boy from one of the Novosibirsk mathematical schools.
- V.: Have you ever been to Novosibirsk?
- M.: Yes, I have been there this year with a group of students of our faculty.
- V.: What have you seen there?
- M.: Oh, I have seen a lot. But now I have no time to tell you about it. Well, Vera, what are you doing here? Are you reading for your exams too?
- V.: No, I am not. I've passed all my exams with good marks this term and so my holidays have already started. I'm waiting for my friend here. Good luck, Mike.

Упражнение 5. Определите, чем выражено подлежащее каждого предложения, переведите.

1. After the international conference on ecology it has become possible to begin working at environmental problems on a global scale. 2. Some scientists and engineers are working at improving traditional production processes, others are developing new technologies. 3. The new instruments will enable us to determine the level of pollution in our rivers. 4. Our technological advances make it possible to deal with the most difficult problems. 5. Our lecturer's book on strength of materials is well-known and popular. 6. One must study six years to become an engineer. 7. There is a big library in the new building of our institute. It is a very good library. One may get all the necessary books there and it is possible to keep them till the end of the academic year. 8. It is well-known that technological progress is impossible without electronics, computers, robots and new materials. 9. That ecological problems have become the most important ones at present is evident to all. 10. What is necessary for the students is to get a good qualification. 11. That S.P. Korolyev was the founder of practical cosmonautics is a well-known fact. 12. That theory is combined with practical training is a very good tradition of our educational system. 13. That it is necessary to develop an international ecological program is realized throughout the world.

Упражнение 6. Найдите сказуемое в каждом предложении, переведите.

1. The electronic industry produces several types of minicomputers. 2. The air in many cities has been polluted by traffic and industry. 3. The lecture on environment protection was very interesting. 4. Mankind has never experienced changes in life and work

on such a scale. 5. The task of the world community is to improve the ecological situation in the world. 6. In six years we shall become engineers. 7. It is possible to take measures to protect environment on a global level by the joint efforts of all countries. 8. Professor N. is the dean of our faculty. 9. The important feature of our education is that it combines theory with practical training. 10. The main tendency of our life is that computers are being used in all spheres of technology, science and everyday life. 11. The essential feature in environment protection is that most of it is done by public initiative. 12. What is necessary today is that the protection of global natural resources must be planned. 13. Today one of the most important problems is that big cities are polluted.

СЛОВООБРАЗОВАНИЕ

Упражнение 7. Переведите следующие производные слова согласно образцу:

глагол + -er/-or = существительное

to teach — учить, обучать → teacher — учитель

to regulate — регулировать → regulator — регулятор

to lecture — лектор, to speak — speaker, to invent — inventor, to generate — generator, to transform — transformer, to indicate — indicator, to compute — computer;

суффиксы прилагательных -ant/-ent

to excel — превосходить → excellent — превосходный

important, efficient, distant, evident, confident, recent;

отрицательные префиксы in-/im-

questionable — спорный → unquestionable — неоспоримый, несомненный

material — immaterial, limited — unlimited, important — unimportant, usual — unusual, natural — unnatural, necessary — unnecessary, known — unknown, qualified — unqualified, changing — unchanging, seen — unseen, possible — impossible, perfect — imperfect, personal — impersonal, mobile — immobile.

Упражнение 8. Прочитайте и переведите интернациональные слова.

electricity [ɪlek'trɪsɪti], civilization [ˌsɪvɪlaɪ'zeɪʃən], economic and social progress ['prəʊgrəs], transformer [træns'fɔ:mə], universal [ˌju:nɪ'və:səl], electrometallurgy [ɪ'lektrəume'tælədʒɪ], cable ['keɪbl], specific [spr'sɪfɪk], machine [mə'ʃi:n], photocopying machine, radar ['reɪdə], Paris ['pærɪs], generator ['dʒenəreɪtə],

battery ['bætəri], lamp [læmp], dynamo ['daɪnəməu], indicator ['ɪndɪkeɪtə], nation ['neɪʃən], energy ['enədʒɪ], service ['sə:vɪs], laser ['leɪzə], compact ['kɒmpækt].

Упражнение 9. Прочитайте и запомните произношение слов.

imagine [ɪ'mædʒɪn], turn [tɜ:n], daily ['deɪli], completely [kəm'pli:tli], power ['paʊə], appearance [ə'piərəns], gear [gɪə], pulley ['pulɪ], whole [həʊl], range [reɪndʒ], device [dr'vaɪs], source [sɔ:s], century ['sentʃuri], design [dr'zaɪn], since [sɪns], consumption [kən'sʌmpʃən], double [dʌbl], health [helθ], reduce [rɪ'dju:s], beam [bi:m], advantages [əd'vɑ:ntɪdʒɪz], clean [kli:n], regulated ['regjuleɪtɪd], generate ['dʒenəreɪt], human ['hju:mən], latest ['leɪtɪst].

СЛОВА И СЛОВСОЧЕТАНИЯ ДЛЯ ЗАПОМИНАНИЯ

advantage *n* — преимущество

appearance *n* — появление

application *n* — применение, заявление

completely *adv* — полностью, целиком

consumption *n* — потребление, расход

cover *n* — охватить, охватывать,

design *v* — конструировать, проектировать

device *n* — прибор, устройство

double *v* — удваивать

efficient *a* — эффективный

generate *v* — вырабатывать, производить

imagine *v* — представлять себе, воображать

invent *v* — изобретать

power *n* — энергия, мощность

property *n* — свойство

recent *a* — недавний, последний

reduce *v* — уменьшать, снижать

replace *v* — заменять

set up (set) *v* — воздвигать, сооружать

source *n* — источник

state *n* — положение, состояние

such as — такой как

transform *v* — преобразовывать

turn *v* — поворачиваться, обратиться; превратить (into)

wide *a* — широкий

without *prp* — без

whole *a* — весь, целый

in the case of — в случае

to be based on — основываться, быть основанным на

Text 3A

Прочитайте текст, перечислите наиболее важные изобретения в области электротехники. Переведите.

Electricity

It is impossible to imagine our civilization without electricity: economic and social progress will be turned to the past and our daily lives completely transformed.

Electrical power has become universal. Thousands of applications of electricity such as lighting, electrochemistry and electro-metallurgy are longstanding and unquestionable.

With the appearance of the electrical motor, power cables replaced transmission shafts, gear wheels, belts and pulleys¹ in the 19-th century workshops. And in the home a whole range of various time and labour saving appliances² have become a part of our everyday lives.

Other devices are based on specific properties of electricity: electrostatics in the case of photocopying machine and electromagnetism in the case of radar and television. These applications have made electricity most widely used.

The first industrial application was in the silver workshops in Paris. The generator — a new compact source of electricity — was also developed there. The generator replaced the batteries and other devices that had been used before.

Electric lighting came into wide use at the end of the last century with the development of the electric lamp by Thomas Edison. Then the transformer was invented, the first electric lines and networks were set up, dynamos and induction motors³ were designed.

Since the beginning of the 20th century the successful development of electricity has begun throughout the industrial world. The consumption of electricity has doubled every ten years.

Today consumption of electricity per capita⁴ is an indicator of the state of development and economic health of a nation. Electricity has replaced other sources of energy as it has been realized that it offers improved service and reduced cost.

One of the greatest advantages of electricity is that it is clean, easily-regulated and generates no by-products⁵. Applications of electricity now cover all fields of human activity from house washing machines to the latest laser devices. Electricity is the efficient source of some of the most recent technological advances such as the laser and electron beams. Truly⁶ electricity provides mankind with the energy of the future.

Notes to the Text

1. transmission shafts, gear wheels, belts and pulleys — трансмиссионные валы, зубчатые колеса, ремни и блоки
2. time and labour saving appliances — электроприборы, экономящие время и труд
3. induction motors — индукционные моторы
4. per capita — на человека; на душу населения
5. by-products — побочные продукты
6. truly — поистине

УПРАЖНЕНИЯ

Упражнение 10. Просмотрите текст 3А и ответьте на вопросы.

1. What is this text about? 2. What industrial applications of electricity do you know? 3. What home applications of electricity do you know? 4. Where was the generator developed? 5. Who invented the electric lamp? 6. Do you know who invented the dynamo? 7. Can you imagine our life without electricity? Why?

Упражнение 11. Определите функции глагола *to have*, переведите.

1. Electricity has many useful properties: it is clean and generates no by-products. 2. It has many important applications in industry as well as in our houses. 3. The latest laser devices have found application in medicine. 4. Electricity has provided mankind with the most efficient source of energy. 5. No other source of energy has been so widely used as electricity. 6. We have many various electric devices in our houses. 7. Our lives have been completely transformed with the appearance of electricity. 8. The generator replaced batteries that had been used before. 9. The consumption of electricity has doubled every ten years.

Упражнение 12. Найдите подлежащее и сказуемое в предложениях, переведите.

1. That electricity is clean and easily-regulated is its great advantage. 2. The important fact is that electricity offers improved service at reduced cost. 3. That the two scientists Lodygyn and Yablochkov were the first in Russia to work in the field of electrical engineering is well-known. 4. One of the main advantages of electricity is that it does not pollute the environment. 5. The indicator of nation development is how much electricity is consumed per capita. 6. What has been and is being done in environment protection cannot be measured by yesterday's standards.

Упражнение 13. Определите время и залог глагола-сказуемого, переведите предложения.

A. 1. I have not cleaned the window yet. I am cleaning it now. I have cleaned it. 2. But Bob has a different idea. 3. Last year she passed school leaving exams. 4. We will be studying for our exams at the end of the term. 5. While we were having supper, all the lights went out. 6. Will people speak the same language all over the world? 7. People will land on Mars in the 21st century. 8. I think cars will be powered by electric batteries in five years' time and they will not be powered by atomic power in 100 years' time. 9. The Earth is getting warmer because of the increase of carbon dioxide in the atmosphere.

B. 1. It is evident that electricity will be the energy of the future. 2. The transformer was invented and the first electric lines and networks were set up at the end of the 19th century. 3. New powerful electric stations must be built because it is electricity that offers improved standards of life and work. 4. A combination of electric lines and networks are being set up throughout the country. 5. Electric power has become universal. 6. Electricity is transmitted to distant parts of this country by a combination of electric networks. 7. Our power stations have been connected by high voltage transmission lines into several networks.

УПРАЖНЕНИЯ ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ

Упражнение 14. Определите, к какой части речи относятся производные слова и переведите их.

invent — inventor, inventive, invention;
transform — transformer, transformation;
generate — generator, generation, generative;
pollute — polluter, pollutant, pollution;
effect — effective, effectively;
vary — variety, various;
possible — impossible, possibly, possibility;
complete — completely;
recent — recently;
replace — replacement;
economic — economical, economically.

Упражнение 15. Найдите:

а) синонимы

application, appliance, latest, power, use, enable, reach, device, longstanding, make it possible, achieve, energy, transform, old, turn to, most recent;

б) антонимы

future, unlimited, with, past, necessary, limited, old, unnecessary, without, present.

Упражнение 16. Поставьте глагол в скобках в соответствующем времени.

My brother (enter) Moscow University (long ago, already, just, next year, last year, this year, by the end of the month, when I came to Moscow).

Упражнение 17. Найдите предложения со словами *to have, one, that*, переведите.

Although the US is a large country with many peoples the language is almost the same wherever one goes. There are two reasons for this. One is that people move around a great deal in the US. A man can grow up in one part of the country, go to college in another place, find work in another place and marry a girl from still another part of the country.

The second important factor is public communication. Movies, radio and television all have standard way of speech. The southern part of the US is probably the region with the most individual speech. Southern pronunciation differs from that in the rest of the country. Southerners talk slowly and often do not pronounce «r» or a final «g». Another common Southern expression is the unusual use of the word «evening». In most parts of the country this means the time after the sun goes down, the early part of the night, but to a Southerner it can mean any time after twelve o'clock noon. In the southern mountains there have not been new settlers from other countries for two hundred years. They have ways of speech that are like the English spoken centuries ago when the first people came there from England. Many songs they sing today are those sung long ago in England.

Упражнение 18. Поставьте глагол *to be* в соответствующей форме.

Today is ..., ..., 20...

I ... at my English class. I ... reading a story about Thomas A. Edison. I ... learning that his laboratories are in Orange, New Jersey. I ... glad to read about such a man as Th.A. Edison. A young inventor ... in Thomas Edison's laboratory. He ... looking at an invention that ... in a glass case. It ... an electrical invention. The young inventor's pencil ... in his hand. He ... drawing the part of the invention which he came there to study. An Englishman and his young son ... in Edison's laboratory. They ... looking at hundreds of

inventions. Many of them ... in glass cases. The man and his son ... interested in all Mr. Edison's inventions, they ... most interested in the electrical ones. Many of those ... in one room. Several tourists ... in this room, and among them ... the Englishman and his son. The man says to one tourist, «We ... interested in electrical ones».

Упражнение 19. Вставьте предлоги *to, with, about, at, for, on, in*.

This morning father spoke ... my brother and me ... going to see our aunt this evening. It is our aunt's birthday. We wanted to surprise her family. Our mother was going to go ... us. We had to be ready... seven o'clock. We wanted to be ... our aunt's house ... seven thirty. We left ... my aunt's house... seven... our mother and father. But the aunt was not ... home. Her children had taken her and the uncle... the theater. We laughed: we had a surprise party, but it was on us. We left the presents and went ... a show ourselves.

We went ... Kuskovo yesterday. I went... my mother and father. We took our lunch ... us. We reached Kuskovo ... noon. Father went ... a parking station, but it was full. He went to another and then ... another. Every parking station was crowded. Father drove for a while. ... one o'clock he found a place ... a car. ... two o'clock our friends came, we sat down ... grass and ate our lunch. We didn't see much because too many people were there ... Kuskovo. Next time we have a day to spend we shall go ... some other place.

Упражнение 20. Дайте недостающие формы глаголов, запомните их.

becoming, set up, keep, understand, spoken, showing, built, left, light.

Упражнение 21. Прочитайте и переведите текст без словаря.

Before Faraday's inventions in the field of electricity and magnetism the only source of electricity that was used was the galvanic battery. It made possible some practical applications: the electric light and electric telegraph. The practical use of electricity on a larger scale became possible after developing electromagnetic machines, generators and transformers. It is considered that the development of the induction motor has become the most important technical achievement. At first, the induction motor had a constant and unchangeable speed (скорость). Some years later a motor with two speeds was designed. Since its invention the induction motor has been considerably improved and its power increased. But the principle of operation still remains the same.

CONVERSATION

Exercise 1. Answer the questions.

1. What is electricity? (a source of electric power used in every day life and industry) 2. What are the sources of electricity? (batteries, generators, electric motors and many other devices) 3. What properties of electricity have made it widely used? (electrostatics and electromagnetism) 4. What are the advantages of electricity? (clearness, easy regulation, no byproducts, low cost, improved service) 5. What are home uses of electricity? (lighting, heating, various time and labour saving appliances, radio, television, video and many others) 6. What are the latest industrial applications of electricity? (lasers and electronic devices)

Exercise 2. Make a sentence out of the two parts.

1. Electricity	1. have already become universal.
2. The applications of electricity in the home and industry	2. has completely transformed our everyday life.
3. Electricity was used for the first time	3. per capita is an indicator of the state of development of a nation.
4. The generator, a new source of electricity	4. the wide industrial use of electricity has begun throughout the world.
5. Since the beginning of the 20-th century	5. was also developed in Paris.
6. Today consumption of electricity	6. for industrial purposes in the silver workshops in Paris.

Exercise 3. Read and learn.

A Story about Edison

Edison: Oh, Ben, I'm glad to see you. How are you?

Wilson: Fine, and how are you?

Ed.: So-so. A lot of work to do. Just today I've begun some important work. Oh, excuse me, meet my assistant John Smith. John, this is my old friend from my home town, Ben Wilson.

Smith: How do you do, Mr. Wilson?

W: How do you do, Mr. Smith? Glad to meet you.

Ed.: Will you come to my laboratory and have dinner with John and me tonight?

W.: Yes, I will.

Ed.: Come at six tonight, will you?

W.: I'll certainly come.

At six o'clock at the laboratory.

W.: Good evening, Tom. Good evening Mr. Smith.

S.: Good evening, Tom. Good evening Mr. Wilson. Mr. Edison is experimenting with a microscope. All his interest is there. Would you mind walking around for a while looking at Mr. Edison's inventions.

W.: With pleasure.

S.: In a few minutes dinner will be brought. We usually eat our dinner here. Don't you mind?

W.: Certainly not.

S.: The dinner is ready. Let Mr. Edison know you are here.

W.: Shall we eat, Tom? But he doesn't answer.

S.: He is busy working with his microscope.

W.: But I am quite hungry. Tom, the food looks good, and it is getting cold.

S.: You see, Mr. Edison never stops working for a second till he is satisfied with what he is doing.

W.: Then let's sit down and eat.

Two hours later Mr. Wilson and Smith finished eating and left the laboratory.

Ed. (entering the laboratory):

Oh, I am hungry. If those dishes were not empty, I'd say I've had no dinner tonight.

Exercise 4. Speak about:

1. Electricity — its nature, history and development.
2. Applications of electricity cover all fields of human activity.

Use exercises 1, 2, as well as the following words and word combinations for your topic:

it is difficult to imagine; applications such as; completely; to replace; to come into wide use; to double every ten years; to be an indicator; the latest technological advances.

Exercise 5. Read and smile.

A young doctor, the son of a well-known professor of medicine, proudly (с гордостью) told his father one day: «Imagine, dad! I've cured (вылечить) that lady that has been your patient for ten years».

«She deserved (заслужить) it. It was she who had paid for your studies», his father replied.

«Where did the car hit him?», asked the coroner (следователь). «At the junction (стык, перекресток) of the dorsal and cervical vertebrae (спинных и шейных позвонков)», answered the doctor. A big man rose from his seat. «Listen, I've lived in these parts for fifty years», he protested, «and I've never heard of this place».

Text 3B

Прочитайте текст. Ответьте на вопрос, почему Эдисон сказал: «Don't watch the clock».

A Great Citizen of the World

Every day many people visited Thomas A. Edison's laboratories in Orange, New Jersey. Some of them were young inventors who went to study, but many more of them were tourists. They came from all parts of the US and from other countries as well.

One day a very important citizen from England visited Edison's factories, taking with him his young son, eight years old. They spent many hours in great workshops, looking at hundreds of useful inventions.

Before leaving the laboratories the man went to the office of the main building. Giving his card to the person in charge, he asked: «May I speak to Mr. Edison, please?». The man looked at the card and then answered: «Wait a minute, I'll see». Soon he returned and said: «Come this way, please. Mr. Edison will see you».

The father and his son went into the great inventor's workroom. «Mr. Edison», said the Englishman, «I brought my young son here to see what the world's greatest citizen has done. I want this day to help him all his life. Will you please shake hands with him and say something that he will remember?»

Mr. Edison took the boy's hand. He laid his other hand on the child's shoulder and looked into his eyes. «My boy», he said, «don't watch the clock».

In 1928 Mr. Edison was eighty-one years old, but he still worked sixteen hours a day.

Text 3C

Прочитайте текст. Расскажите по-английски о преимуществах солнечной энергии в качестве источника электричества.

Solar Light by Night

Most people living in towns consider it a usual thing that streets are lit at night. But street lights need a power supply (источник

энергии) therefore distant areas with no source of electricity remain in darkness until the sun comes up again.

With new appliances now offered by several British firms, many distant places could be lit with solar-powered street lights. It may seem strange that the lamps can use the power of the sun which shines by day when the lamps are needed at night, but they work by using energy accumulated during the day from a solar panel. The solar panel produces electricity which charges (заряжать) a battery. When the sun goes down, the battery power is then used for lighting. Each lamp has its own panel so the system can be used for one individual light or a number of them.

In the south of Saudi Arabia a motorway tunnel miles from any power supply is lit day and night by solar-powered devices. The solar panels provide power during the day and charge batteries which accumulate enough power to light the tunnel at night. The generation of electricity by batteries is still expensive but the advantage of sun-powered lamps is that they can bring light to areas distant from any other power supply.

There is one more advantage of solar power: not only it is unlimited, but also its use does not pollute the environment. That is why it is very important to develop devices which make it possible to transform solar power into mechanical or electric forms of power.

Text 3D

Прочитайте текст. Найдите информацию о наиболее перспективных источниках энергии и об основных отличиях нетрадиционных источников энергии от традиционных. Изложите основное содержание текста по-английски.

Non-traditional Renewable Sources of Energy

It is known that much is being done in the world today for the development of non-traditional sources of energy. Without them the Earth cannot support its present population of 5 billion people and probably 8 billion people in the 21st century.

Now we are using traditional power sources, that is, oil, natural gas, coal and water power with the consumption of more than 50 billion barrels per year. It is evident that these sources are not unlimited.

That is why it is so important to use such renewable sources of energy as the sun, wind, geothermal energy and others. Research is being carried out in these fields.

One of the most promising (перспективный) research is the development of power stations with direct transformation of solar energy into electricity on the basis of photo-effect. It was Russia that was the first in the world to develop and test a photoelectric battery of 32,000 volts and effective area of only 0.5 sq.m., which made it possible to concentrate solar radiation. This idea is now being intensively developed in many countries.

However, the efficiency of a solar power station is considerably reduced because of the limited time of its work during the year. But it is possible to improve the efficiency of solar power stations by developing different combinations of solar power stations and traditional ones — thermal, atomic and hydraulic. Today some engineers are working at the problem of developing electric power stations with the use of a thermal-chemical cycle. It will operate on products of the transformation of solar energy, whereas the «solar» chemical reactor uses CO₂ and water steam of the thermal power station. The result is that we have a closed cycle.

In Kamchatka there are geothermal power stations operating on hot water-steam mixture from the depths of about a kilometre. In some projects water will be heated by the warmth of mountains at a depth of four—five km.

It is planned that plants working on the energy of the solar heat provided by the sun will be built on a larger scale.

That different wind energy plants are being developed is also well-known. These energy plants can be small (of several kilowatts) and large powerful systems.

It is important that all these advances in developing new sources of energy and improving the old ones help to solve the energy problem as a whole and they do not have negative effects on the environment.

ДОПОЛНИТЕЛЬНЫЕ ЗАДАНИЯ

Упражнение 1. А. Прочитайте следующие словосочетания из текста 3А и постарайтесь догадаться о значении выделенных слов и словосочетаний.

1. such as **lighting**
2. applications are **longstanding**
3. in the 19th century **workshops**
4. **a range** of appliances
5. devices are **based** on

6. in the case of
7. all fields of
8. human activity

В. Подберите к каждому выделенному в А слову или словосочетанию соответствующее ему по значению.

a. for	e. a number of
b. area or sphere	f. things done by man
c. are built on	g. electric lamps
d. for a long time	h. a small factory

Упражнение 2. А. Прочитайте текст и найдите слова или словосочетания, означающие *portable, work, generate, at present*.

Although most electricity comes from power stations, power can also be generated by far smaller means. Nowadays, electricity generators can be small enough to hold in the hand. A portable generator can provide electricity no matter how far you are from the mains (сеть). It works by turning the movement of a piston into electrical energy. Such a generator can produce a 700 watt output, enough to operate lights, television, and some domestic appliances. Larger versions provide emergency power to hospitals and factories.

В. Найдите в тексте, приведенном в А, слова, означающие:

1. method, way
2. change, transform
3. principal wire to transmit electricity into a building
4. house
5. to be of no importance
6. much, considerably
7. situation needing action as soon as possible
8. power, energy produced
9. variant, form

Упражнение 3. Заполните пропуски следующими словами:

electricity increase consumers power use generation reduce consumption
far users application provide sources energy light

We hear so much these days of local problems of electricity (1) ... Many (2) ... are taking steps to (3) ... their electricity (4) ... This is as a result of the recent (5) ... in electricity tariffs for (6) ... We

should all try to (7) ... less (8) ..., by insulating our houses, turning off the (9) ... when leaving a room and using less hot water.

We must try to develop alternative (10) ... of energy to (11) ... electricity for domestic and industrial (12) ... It is known that nuclear power comes to the consumer as electricity, which is clean and convenient form of (13) ... Although nuclear (14) ... stations are large, they can be built (15) ... from places where people live.

Упражнение 4. Заполните пропуски антонимами выделенных слов.

1. Though the capital investment, that is, the initial cost of building the nuclear power station, is **high**, the cost of generating electricity from a nuclear power station is relatively

2. There is a **limited** supply of fossil fuels such as oil, gas and coal on the earth, but a supply of natural uranium is

3. **Cheap impure** coal produces much more CO₂ than coal of high quality.

4. It is evident to all that an **old inefficient** power station is more dangerous to the environment than a power station.

Упражнение 5. Заполните таблицу на словообразование.

Verb	Noun	Personal noun
...	...	producer
...	operation	...
generate	...	...
...	...	mover
act	...	...
...	design	...
invent	...	...
consume	...	...
...	transformation	...
...	regulation	...
indicate	...	...

Упражнение 6. Составьте возможные словосочетания глаголов из колонки А и существительных из колонки В, переведите их и запомните.

A	B
1. carry out (conduct)	a. a problem
2. solve (face, work at, deal with)	b. changes
3. become	c. a success

4. suffer from	d. an effect on
5. bring about	e. measures
6. have	f. study, research, experimental work
7. make	g. the center of, a part of
8. develop	h. investments
9. take	i. a program, concept, theory
10. achieve	j. noise, pollution

Упражнение 7. Составьте, переведите и запомните словосочетания глагола *become* со следующими словами:

popular, universal, international, possible, important, better, worse, polluted, worried, interested in.

Упражнение 8. А. Назовите 10–15 ключевых слов и словосочетаний на тему: «Electricity as a source of energy».

В. Speak about:

The main types of fuel or processes used to generate energy in our country.

REVISION OF LESSONS 1–3

Упражнение 1. Повторите времена группы Indefinite (Simple), Continuous, Perfect Active, Passive. Определите время глагола-сказуемого и переведите предложения.

1. What course are you taking here? Business English? — No, I am not doing Business English yet. I am trying to improve my general English, especially conversation. 2. I liked the lecturer better after I had heard him the second time. 3. My friend will take the course in English next semester. 4. Who has finished the test? 5. We looked at him while he was dancing. 6. How many books of Shaw have you read? 7. Why have not you told them about it? 8. I shall still be studying English in two years' time. 9. The books were taken from the library. 10. You can find the books taken from the library on the table. 11. The exams are held in June. 12. I have been in the laboratory since 8 o'clock. 13. There were many people coming back from their work. 14. Australia is one of the five continents, but it is much smaller than the other four. 15. The light in that room is poor. Please light the candles (свечи). 16. People speak the language of their country. 17. Every country needs good specialists for its further progress of science and technology. 18. By the year 2030 human labour in industry will have been replaced by robots. Families will have robots to do the housework.

Упражнение 2. Ответьте на вопросы.

What devices and machines using electricity

- a) have become a part of our everyday life?
- b) have made electricity most widely used in all fields of science, technology and industry?
- c) are based on its specific properties?

Упражнение 3. Заполните пропуски следующими словами:

radar battery generator appliances dynamo transformer

1. ... is a machine that generates electricity, steam, gas, etc. 2. A device giving information about position, movement, etc. is named 3. A machine for changing water and steam power into electrical energy is known as 4. Food mixers, toasters, modern dish-washers and a number of the most recent home devices are household 5. An apparatus to increase or decrease the voltage of an electric power supply — ... — was invented at the end of the 19th century. 6. It is known that a portable cell for supplying electricity is called ...

Упражнение 4. А. Прочитайте и переведите текст, обращая внимание на проработанную грамматику уроков 1–3.

Save the Planet

Today's global economy has been formed by market, not by the principles of ecology. This has created an economy that is destroying its natural support system (система естественной поддержки). It is eco-economy that we need today to save the planet. An eco-economy is one that satisfies our needs without affecting the prospects of future generations to meet their needs. Therefore, it is necessary to turn our economy into in eco-economy. To build an eco-economy means to restore carbon balance, to stabilize population and water use, and to conserve forests, soils and variety of plant and animal life in the world.

Such an eco-economy will affect every side of our lives. It will change how we light our homes, what we eat, where we live, how we use our free time, and how many children we have. It will give us a world where we are a part of nature.

Building a new economy means eliminating and replacing old industries, restructuring existing ones, and creating new ones. The generation of electricity from wind is one such industry. Soon millions of turbines will be turning wind into electricity. In many countries, wind will provide both electricity and hydrogen. Together, electricity and hydrogen can meet all the energy needs of a modern society.

Another industry that will play an important part in the new economy is management of available water supply most efficiently. Irrigation technology will become more efficient. The recycling of urban waste water will become common. At present, water flows into and out of cities, carrying waste with it. In the future, water will be used again and again, never discharged (спускать, выливать). As water does not lose its quality from use, there is no limit to how long it can be used, as long as (пока) it is cleaned before reuse.

One can easily see eco-economy changes in some countries. It is known that Denmark is the eco-economy leader. It has stabilised its population, banned (запрещать) the construction of coal power plants, banned the use of non-refillable drink containers, and is now getting 15 per cent of its electricity from wind. Besides, it has restructured its urban transport networks; now 32 per cent of all trips in Copenhagen are on bicycles. Denmark is still not close (near) to balancing carbon emission, but it is moving in that direction.

В. Speak about:

Your idea of the economy of the future.

LESSON 4

Согласование времен

Дополнение

Дополнительные придаточные предложения

Суффикс *-ible/-able*

Префикс *dis-*

Текст 4А. *Television*

Текст 4В. *Telegraph*

Текст 4С. *Telephone*

Текст 4D. *Talking via Space*

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

Упражнение 1. Повторите времена групп Indefinite (Simple), Continuous, Perfect. Поставьте глаголы в скобках в нужном времени и форме.

At the time I first (meet) Mr. Alien in 1990, he (consider) the possibility of studying foreign languages again. He (forget) everything that he (learn) about Latin and French at school. The languages that he (want) (learn) at that time (be) Spanish and Portuguese. He (to be going) to study those languages in the Department of General Education at New York University. Therefore, he (enrol) that school in 1991.

After my friend (finish) studying at New York University he (decide) (go) to South America for a year. Because he (be, never) there before, he (enjoy) visiting the famous cities of Brazil and Argentina. He liked São Paulo so much that he (consider) staying there much longer. Before that time he (hope, always) to find a place with an ideal climate. Therefore, São Paulo (seem) to be a real paradise (рай). However, he (spend) all his money and (to be forced) to return.

Now my friend Mr. Alien (plan) (visit) France next year. He (leave) for Paris on March 15. Mr. Alien (visit) also Germany on the same trip. He realizes that he must (learn) French and German before he (go) to Europe. At present he (take) a course in French in preparation for the trip. He (think) that French (be) quite easy. Of course he (be, never) in France before, so he (have) little opportunity to hear French. He (work) very hard at his French every day. He (study) German at New York University next semester. I am sure that he (have) no language problem in the other countries when he (get) there. Many people in those countries (understand) English or French.

Упражнение 2. Переведите предложения, обращая внимание на правило согласования времен.

1. We knew that his family lived in Orel. 2. He said that the students of that group were studying in the library. 3. She thought that she might finish her work by two o'clock. 4. I didn't think he could come there in time. 5. She said that her name was Lena. 6. The students were told that they had three lectures every day. 7. The dean said that he was busy. 8. We found that he had studied mathematics at the University. 9. The newspapers reported that the Trade Union Congress had finished its work. 10. Students were informed that they would have industrial training in the third year. 11. The weather-man reported over the radio that it would be cold the following weekend.

Упражнение 3. Поставьте глаголы в скобках согласно правилу согласования времен.

A. 1. He says that he (want) to be an engineer. 2. He thinks that he (see) a new device already. 3. He knows that he (lose) his watch yesterday. 4. He says that he (help) with work next week. 5. He said that he (know) him. 6. He understood that the speaker (be) in London recently. 7. He said that he (think) about it later. 8. He asked what they (want) to do. 9. They asked when we (come) to see him. 10. He asked if I (can) stay with them. 11. The teacher wanted to know whether I (be) good at maths. 12. The professor wanted to know whether I (take) part in our conference the week before. 13. My friend wanted to know whether I (go) to the library next Saturday. 14. He asked which book she (read) at that moment.

B. 1. The engineer was told that he (may) test the device in the afternoon. 2. It was known that the head of our laboratory (be) a graduate of Moscow University. 3. They thought that she (graduate)

from a technical institute. 4. Our professor informed us that he (give) the following lecture on quantum mechanics on Monday. 5. At the meeting it was said that our lecturer (work) at a new programme of laboratory work. 6. The teacher told us that the term «engineering» (have) many Russian equivalents. 7. The chief engineer believed that we (work) at that problem for a month the following summer.

Упражнение 4. Переделайте следующие предложения в косвенную речь, поставив глагол в главном предложении в прошедшем времени. Например:

Tom wants to spend the winter in Texas.

They said that Tom wanted to spend the winter in Texas.

He asked if Tom wanted to spend the winter in Texas.

1. Mary wants to take a course in German. 2. Ann does not work at the college. 3. The laboratories have new TV sets. 4. The teacher will give you further instructions. 5. Where are you coming from? 6. The lecture will begin in five minutes. 7. John has learned grammar for two years. 8. Could I speak to Mr. Smith, please? 9. Does Bob go to the library every day?

Упражнение 5. Переведите на английский язык.

1. Мой друг сказал, что он много работает. 2. Ученый сообщил, что он написал статью о своей работе. 3. Меня спросили, сделал ли я свою работу. 4. Она хотела знать, будет ли он летом в Москве. 5. Мы спросили преподавателя, сколько новых слов в четвертом уроке. 6. Мы не знали, будет ли у него практика летом. 7. Он сказал, что знает два иностранных языка. 8. Он знал, что ее брат живет в Самаре.

Упражнение 6. Определите, чем выражено дополнение в предложениях, переведите.

1. The students of our group saw a new film yesterday. They said it was very interesting. 2. The dean's assistant told us to do all our work in time. 3. Our laboratory has been equipped with modern devices. 4. The students were informed at the meeting that they would have their practical training in St. Petersburg. 5. We asked the dean if he was busy. 6. The new student asked when our lectures would begin. 7. He also asked to show him where the chemistry laboratory was. 8. He wanted to know whether we had already had our industrial training. 9. I did not know then if I should see him again. 10. We didn't know whether it would be possible to use a computer for our work.

Упражнение 7. Обратите внимание на перевод предлога *by* в предложениях.

1. By 3 o'clock I shall be free and go with you to the library.
2. By the end of the second year we shall have finished studying the main engineering subjects.
3. By the beginning of the lecture the laboratory assistant had brought all the necessary diagrams.
4. By the year 2010 cable television will have been used more widely.
5. By the spring of 1945 World War II was over.

Упражнение 8. Найдите русские эквиваленты для словосочетаний.

it is true; compared to; to be of importance; a lot of; to be interested in; like; a step forward; at the right time; direct to; to put into memory.

интересоваться; иметь значение; по сравнению с; ввести в память; шаг вперед; как, подобно; верно (правильно); в нужное время; много; непосредственно на.

СЛОВООБРАЗОВАНИЕ

Упражнение 8. А. Переведите следующие производные слова согласно образцу:

существительное или глагол + -ible/-able = прилагательное

access — доступ → accessible — доступный

to rely — доверять → reliable — надежный,

practice — осуществление (на практике) → practicable — осуществимый

to use — usable, to consider — considerable, to avail — available;

префикс dis- (имеет отрицательное значение)

to appear — появляться → to disappear — исчезать

to like — to dislike, illusion — disillusion, similar — dissimilar, comfort — discomfort, to connect — to disconnect, connection — disconnection, connected — disconnected, to organize — to disorganize, organized — disorganized, organization — disorganization.

В. Образуйте и переведите производные слова согласно образцу:

tele- (на большом расстоянии)

television, telegraph, telegraphy, telemetry

phone, text, scope, printer, communication;

photo- (имеющий отношение к свету или фотографии)

photon, photograph, photography, photographic

copy, finish, meter, electric, sensitive.

Упражнение 9. Прочитайте и переведите интернациональные слова.

television ['telɪvɪzən], action ['ækʃən], territory ['terɪtəri], material [mə'tɪəriəl], million ['mɪljən], communication [kə'mju:nɪ'keɪʃən], central ['sentrəl], programme ['prəʊgræm], transmission [trænz'mɪʃən], telephone ['telɪfəʊn], cable ['keɪbl], signal ['sɪgnl], crystal ['krɪstl], code [kəʊd], visual ['vɪʒjuəl], video, regular ['regjələ], zones ['zəʊnz].

Упражнение 10. Прочитайте и запомните произношение следующих слов:

tiny ['taɪnɪ], fair [fɛə], research [rɪ'sə:tʃ], to spread [spred], instead [ɪn'sted], watch [wɒʃ], provide [prə'vaɪd], artificial [ɑ:trɪ'fɪʃəl], convenient [kən'vi:njənt], nowadays ['naʊədeɪz], wire ['waɪə], launching ['lɔ:nʃɪŋ], to break [breɪk], to produce [prə'dju:s], production [prə'dʌkʃən], to weigh [weɪ], clear [klɪə], major ['meɪdʒə], available [ə'veɪləbl], satellite ['sætələɪt], size [saɪz], tape [teɪp], liquid ['lɪkwɪd], magazine [ˌmæɡə'zi:n].

СЛОВА И СЛОВСОЧЕТАНИЯ ДЛЯ ЗАПОМИНАНИЯ

appear <i>v</i> — появляться	influence <i>n</i> — влияние
artificial <i>a</i> — искусственный	means <i>n</i> — средство
compare <i>v</i> — сравнивать	nowadays <i>adv</i> — сейчас, в настоящее время
contain <i>v</i> — содержать, вмещать	occur <i>v</i> — происходить, возникать
continuous <i>a</i> — непрерывный	rapidly <i>adv</i> — быстро
convenient <i>a</i> — удобный	research <i>n</i> — исследование
direct <i>a</i> — прямой, непосредственный	simultaneously <i>adv</i> — одновременно
during <i>prp</i> — в течение, во время, в продолжение	state <i>v</i> — утверждать
equipment <i>n</i> — оборудование	switch on <i>v</i> — включать
essentially <i>adv</i> — по существу, главным образом	time <i>n</i> — время, times — раз
etc (etcetera) — и т. д.	transmit <i>v</i> — передавать
exist <i>v</i> — существовать	watch <i>v</i> — наблюдать, смотреть
few <i>a</i> — мало, немного	weigh <i>v</i> — весить, взвешивать
a few — несколько	within <i>prp</i> — в пределах, в, через

a lot of — много;

to be able to — мочь, быть в состоянии

Text 4A

Прочитайте текст и найдите абзацы, содержащие информацию о развитии различных видов телевизионных систем в хронологической последовательности. Переведите.

Television

The television set is evidently the most important and popular electronic product of all time. All homes in developed countries have one or more TV sets and in many countries there are considerably more TV sets than telephones.

But in 1939 at the World's Fair in New York a tiny nine-by-twelve inch box was the centre of attention for hundreds of people. They were the first to see a television set in action. Compared to today's TV shows of underwater and outer-space research, those first black-white pictures were not very good. The pictures were only transmitted from one side of the Fair territory to the other. But in 1939 they were of historical importance.

Within a few days the news of television spread throughout the world. A lot of people wanted to have a look¹ at the new invention. Everyone was interested in it. But only few people owned television sets in the next few years. When World War II broke out² electronic factories that began the TV production stopped making them and started making war materials instead. When the war was over, TV sets began coming off factory assembly lines. By 1958 there were millions of them.

In a surprisingly short time people watched fewer films and turned from newspapers and magazines to TV. In its short history television has had great influence on people's life and way of thinking. Rocket-launching, concerts and football and tennis matches can be seen direct as they occur. The boundaries of time and space have disappeared.

At present TV communication is provided with the help of a system of artificial earth satellites so that people living in different parts of the country and all over the world and in different time zones are able to watch the central TV programs at the most convenient hours.

Nowadays many countries also have cable TV, a system using wires for the transmission of television programs (like telephone calls). Cable television first appeared in 1949 as a means of transmitting TV signals to rural and mountain areas far from big cities. Cable television's next big step forward was made by the mid — 1980s. Scientists announced that many technical problems had

been solved and in the future it would be possible via satellite and cable TV to use more channels on a TV set at every home in the world.

Then we saw how a new technical invention, colour television, was rapidly replacing black-and-white television. Recently it was reported that the first pocket-size³ colour television set had been developed. It was stated that a liquid-crystal display⁴ was used similar to those on calculators and watches and that it weighed less than a pound.

A few years ago it became evident that the next major advance for TV would be digital television. In a digital system the usual continuous signal is replaced by a digital code containing detailed information on brightness, colour, etc. A digital TV set hangs on the wall like a picture. Essentially, it is a minicomputer with a visual display. Once a week⁵ you put the programs you like into the memory, and the TV set will automatically switch on the desired channel at the right time. You can watch several programs simultaneously on miniscreens and then produce one of them in full format. Also, the TV set can automatically video-record the programs when you are absent or occupied.

By the end of 1980s television has moved to a new and the most important stage in its development since the appearance of colour television. Technically it is called high-definition television (HDTV)⁶ or Hi-Vision. This is the much higher resolution television⁷ of the 21st century. This revolution was started by Japanese manufacturers when they developed a new video system with a picture resembling a wide-screen film more than traditional television. The new system increases the screen's width-to-height ratio⁸ (16:9). The result is a picture several times sharper than in the existing TV sets. Besides, recent developments in plasma display panel technology⁹ make HDTV commercially practicable. The plasma display makes it possible to produce a large, bright, colour, flat TV screen so thin and light that it can also be hung on a wall like a framed picture. The engineering problem that has existed almost since the first days of television may be solved now.

Notes to the Text

1. to have a look — взглянуть, посмотреть
2. to break out — начаться, разразиться
3. pocket-size — карманный
4. liquid-crystal display — устройство изображения на жидких кристаллах

- 5. once a week — раз в неделю
- 6. high-definition television (HDTV) — телевидение высокой четкости
- 7. high resolution television — телевидение с большим разрешением
- 8. width-to-height ratio — отношение ширины к высоте
- 9. plasma display panel technology — производство плазменных панелей

УПРАЖНЕНИЯ

Упражнение 11. Просмотрите текст 4А и ответьте на вопросы.

1. When did the first TV set appear?
2. Were people interested in the new invention?
3. Why was the TV production stopped in 1940?
4. What is cable television?
5. What is digital television?
6. What is high-definition television?

Упражнение 12. Укажите, какие из следующих утверждений соответствуют содержанию текста 4А.

1. A lot of people owned television sets in the first years after its invention.
2. First television black-and-white pictures were excellent.
3. Only few people owned television sets in the next few years after their appearance.
4. Black-and-white television was rapidly replacing colour television.
5. First television black-and-white pictures were not very good.
6. Only a few years ago colour television was rapidly replacing black-and-white television.
7. When the war was over, TV sets stopped coming off factory assembly lines.
8. After World War II TV sets began coming off factory assembly lines.

Упражнение 13. Найдите в тексте 4А предложения, в которых использовано правило согласования времен, и переведите их.

Упражнение 14. Прочитайте и укажите способы присоединения придаточных дополнительных предложений к главному.

1. It was reported in 1939 that the first TV set was shown at the World Fair in New York.
2. The students wanted to know whether colour television sets were produced at that plant.
3. After the war when the mass production of TV sets began, people realized they wanted to have a TV set at home.
4. Experiments proved that electricity could travel instantly over a long piece of wire.
5. Can you tell me whether satellites are used for telephone communication?
6. It became clear television had a great influence on people's life.

7. Russian newspapers informed that about 2,000 satellites had been launched into the orbit. 8. We did not know whether the development of television had continued during the war. 9. We know he works at the problem of space communication.

Упражнение 15. Прочитайте и найдите предложения, где использовано правило согласования времен.

1. Some years ago India began its Satellite Instructional Television Experiment. This experiment showed (that) satellite television programs had been a success with schoolchildren, their knowledge level had increased considerably. It was found that children could remember and speak about programs which they had seen several weeks back. 2. Many experts could not decide whether so much TV was harmful to the individual's health and mental activity or not. 3. Specialists did not know if it was possible to continue modernizing the electronic equipment of this kind — the costs were too high. 4. There appeared some reports that we had technical means to use much more channels on a TV set and we should be able to see many sports and news programs from all parts of the world soon. 5. At first it was not clear whether new telephone and teletype communication with ships via six satellites was economical and reliable or not. 6. It was announced that the cryogenic cable had been invented in Russia. 7. We read that for the first time electricity had been applied for industrial use in silver workshops in Paris. 8. We know different transmitters are used in a television system — one for the sound channel and the other for the picture channel. 9. We learnt from the lecture that electricity was still considered the main source for new technological developments.

УПРАЖНЕНИЯ ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ

Упражнение 16. Выберите правильный перевод следующих слов:

attention — внимательно, внимательный, внимание;
surprisingly — удивительный, удивление, удивительно;
recorder — записывающее устройство, запись, записывать;
convenient — удобство, удобный, созывать;
numerous — бесчисленный, количество, многочисленный.

Упражнение 17. Назовите основу, от которой образованы следующие слова:

development, conveniently, communication, production, continuous, beginning, transmitter, action, recorder, electronic, si-

multaneously, different, usable, central, calculator, possibility, disconnect.

Упражнение 18. Выпишите сначала синонимы, а затем антонимы.

tiny — small; to disappear — to appear; a lot of — many; different — various; next — following; short — long; to watch — to see; program — show; commonly — usually; less — more; possible — impossible; true — untrue; small — large; nowadays — at present, now; large — tremendous; advance — progress; to start — to begin; major — main; to report — to announce; to occur — to take place; convenient — suitable.

Упражнение 19. Расположите слова в алфавитном порядке.

true, picture, telephone, communication; world, research, assembly, invention; own, beginning, telegraph, central; satellite, first, artificial, convenient; turn, videotape, transmit, size.

Упражнение 20. Назовите в следующих парах первое по алфавиту слово.

concept/concert; complete/compare; invention/invasion; available/availability; commonly/commonless; commune/commit; compulsory/compunction.

Упражнение 21. Напишите исходную форму, по которой нужно искать слово в словаре.

boxes, matches, beginning, tinier, owned, boundaries, possibly, replacing, less.

Упражнение 22. Найдите в словаре подходящее значение для выделенных слов или словосочетаний.

1. The Japanese companies developed the first pocket-size colour **television set**. 2. Man first **set foot** on the Moon in July, 1969. 3. Special **telephone sets** are used at plants in tropical sea climate. 4. A great Russian scientist A.N. Krylov took an active part in the work of the first Atomic Commission **set up** at the Optical Institute. 5. It was Popov who constructed the first **radio set**. 6. One of the global tasks nowadays is to **set up** solar power plants on high orbits. 7. Ships are equipped with **radar sets** helping them to orient at sea.

Упражнение 23. Найдите в словаре и запомните значения выделенных слов.

1. New **directions** of research in robotics were discussed at the last conference. 2. There is no **direct** connection between those

processes. 3. This program is **directed** toward the scientific study of various physico-chemical processes. 4. Our scientists must **direct** their attention to the development of new technologies. 5. Further human progress is **directly** connected with the scientific and technological progress. 6. Our task is to develop technological processes without a **direct** participation of man. 7. The future of mankind depends on the **direction** in which scientific and technological progress will be developing. 8. There is a **direct** communication between spacecrafts and the Earth, and between spacecrafts as well.

Упражнение 24. Поставьте глагол, приведенный в скобках, в соответствующих времени и форме.

The Life of a Student

While I (walk) across the campus (университетский городок) the other day, I (meet) my old friend Bill, whom I (see, not) since May. Naturally, we (stop) (talk) to each other for a few minutes. I asked him how he (do) in his classes that semester. He told me that he (take) a course in English that semester. He said that he (complete) the elementary course two semesters before, and by the next semester he (be) ready (take) the most difficult English course offered at this school. He also said that he (be) interested in getting his degree as soon as possible and he (ask, already) his adviser for permission to take the final examination. «I am glad (hear) that you (make) such good progress», I (say) to Bill. Then I asked him if he (can) tell me the secret of his success. He answered that the secret of his success (be) simple and he (study) at least two hours a day to improve his English.

After that I told Bill I (have) a little difficulty with my course in French at the moment. I said that I (study, not) very hard the last semester, but I (work) harder in the future.

Упражнение 25. Прочитайте текст. Перескажите его содержание, используя косвенную речь.

Albert Einstein liked the film with Charlie Chaplin. Once he wrote a letter to Chaplin:

«Everybody in the world understands your film “Golden Fever” (“Золотая лихорадка”). You will become a great man by all means.»

Chaplin's answer was:

«I like you even more. Nobody in the world understands your “Theory of Relativity” and you have already become a great man.»

Упражнение 26. Дайте недостающие формы глаголов, запомните их.
find, broke, putting, hung, began, seen.

Упражнение 27. Прочитайте и переведите текст без словаря.

Recently it was reported in the press that the USA was trying to build bigger, better and much more expensive TV sets. Experts declared that it was the most important change in television since the invention of colour television. They informed that a new kind of television had images so clear that watching it was like looking through a window.

But it became known that Japanese specialists had started their work on HDTV when nobody else in the world was thinking how to improve TV. The inventors expected that their standard for high-definition television would be used throughout the world. However, the Europeans have announced that they would set their own standard. And now it is not clear whether the Japanese standard will be used or not. Some people consider that a single high-definition TV standard will allow to exchange news and may bring nations together.

CONVERSATION

Exercise 1. Answer the questions.

1. What invention was the center of attention at the World Fair in New York in 1939? (the first black-and-white television set) 2. What stopped the TV production? (World War II) 3. What influence has had television on people's life and way of thinking? (great influence; boundaries of time and space have disappeared) 4. What kinds of TV exist now? (satellite, cable, colour, digital and high-definition television) 5. What is the latest and the most important stage in the development of television since the appearance of colour television? (high-definition television) 6. What is the advantage of high-definition television? (the television of much higher resolution) 7. What technology makes HDTV commercially practicable now? (plasma display panel technology)

Exercise 2. Make a sentence out of the two parts.

1. The first black-and-white
nine-by-twelve inch TV sets

2. In a surprisingly short time

1. has been replaced by colour
television.

2. the development of TV became
digital television in which the usual
signal is replaced by a digital code.

3. At present	3. were of historical importance in 1939.
4. Satellite and cable TV makes it possible	4. television has had great influence on people's life and way of thinking.
5. Recently black-and-white TV	5. is the most important stage in the development of TV since the appearance of colour television.
6. The next major advance in	6. to watch TV programs in different parts of the country and throughout the world.
7. The invention of high-definition television with a picture resembling a wide screen film	7. there are different kinds of television systems: satellite, cable, colour, pocket-size, digital, high-definition television.

Exercise 3. Read and learn.

At the Telephone

Mr. Smith: Can I use your telephone for a long distance call? I couldn't find a pay phone in the building.

Mr. Wilson: Sure.

Mr. S.: My wife is going to meet me in New York tomorrow. I want to tell her what time the train gets in.

Mr. W.: Here you are. New York you can dial the number direct. Dial 2 and then the number.

Mr. S.: There's no answer. I'll call later.

Mr. W.: You can use the telephone any time you want.

Mr. S.: Direct distance dialing is wonderful, isn't it?

Operator: Trunk-service (междугородная), number, please?

Mr. Jones: London Victoria 2884. I say, operator, will you hurry it up for me as I have a train to catch in a few minutes?

O.: Unless your number is engaged, I can put you through almost at once. I am sorry, sir, your number is engaged. (After a few seconds.) I have got your number. Hold the line, please.

Mr. J.: Oh, it's you, Mary?

Mrs. Jones: Is it you, George, dear? How are you? So pleased to hear your voice again! When are you going to come back?

Mr. J.: I can't hear you, dear. Operator, will you try again.
 O.: I think that's better now.
 Mr. J.: Are you there? Is that you, Mary, dear? I say, can you hear me?
 Mrs. J.: Yes, dear, I can.
 Mr. J.: I shall be arriving at Waterloo Station at 5.40 this afternoon. Will you come and meet me?
 Mrs. J.: Certainly, darling.
 Mr. J.: There is something else I want to tell you. Get hold of Smith at the office, will you? Ask him to ring me up tomorrow in the morning.
 O.: Your time is up. If you want to speak on, drop another sixpence, please.
 Mr. J.: All right, dear, so long.

Exercise 4. Speak about:

1. The history of television development.
2. Future development of television.

Use exercise 1 and 2 and the following words and word combinations for your topic: to be interested in; research; it is announced (reported) that; to solve problems; it became clear; compared to (with); to call; have an advantage; to find application in.

Exercise 5. Comment on the following statements:

1. Opponents usually say that the young people are too passive and too lazy (ленивы) because they watch TV so much now.
2. We don't need the telephone, telegraph and television.

Exercise 6. Read and smile.

A Letter to a Sweetheart

A young man was writing a letter to his sweetheart (любимая) who lived just a few miles away in a nearby town. He began to tell her how much he loved her and how wonderful he thought she was. But the more he wrote, the more poetical he became. Finally, he said that in order to be with her he would suffer the greatest hardships (лишения), he would face the greatest dangers (опасность) that anyone could imagine. In fact, to spend only one minute with her, he would climb (подниматься) the highest mountain, he would swim the widest river, he would fight the fiercest (свиный) animals. He signed his name, and then suddenly remembered

that he had forgotten to mention something rather important. So, in a postscript below his name, he added: «By the way, I'll be over to see you on Wednesday night — if it doesn't rain».

A Frenchman in England

A Frenchman was once travelling in England. He could speak English quite well but not perfectly. His vocabulary was not large.

Once, for example, he was eating in a small country inn (гостиница) and he wanted to order some eggs. But he couldn't remember the word for eggs.

Suddenly, through the window, he saw a rooster (петух) walking in the yard. He immediately asked the waiter what the bird was called in English. The waiter told him that it was called a rooster. The Frenchman then asked what the rooster's wife was called. The waiter told him that she was called a hen. The Frenchman then asked what the hen's children were called. The waiter told him that they were called chickens. The Frenchman then asked what the chickens were called before they were born. The waiter told him that they were called eggs. «Fine!», said the Frenchman, «Please bring me two plus a cup of coffee and some toast.»

Text 4B

Прочитайте текст и найдите информацию о том, в каких странах ученые работали над созданием телеграфной связи, какие трудности встретились при этом. Перескажите.

Telegraph

Benjamin Franklin, an American who is famous for his interesting and useful inventions, published his ideas about electricity in 1752. Scientists in many countries became interested in this wonderful form of energy. They wanted to find the answer to a very important question: could the electricity be used to develop a fast, efficient system of long-distance communication? Experiments proved that electricity could travel instantly over a very long piece of wire. But a note that was written on a piece of paper couldn't be put into a wire. How could electricity be used to send a message? A Danish scientist discovered that electricity could move a needle from left to right and that the needle could be pointed at letters on a piece of paper. Then a German government worker made up a code system that could be used with an electric needle. In 1837 two English scientists sent a message by electric telegraph for a distance of more than 1.6 kilometers.

Samuel Morse, an American portrait painter, was experimenting with an electric telegraph too. At first he connected a pencil to an electric wire. When the electricity came through the wire the pencil made wavy lines. Then Morse invented a code that used dots and dashes for the letters of the alphabet. Finally, he discovered that telegraph messages did not have to be written, they could be sent in sound.

On May 24, 1844, the first long-distance message was sent by telegraph for 64 kilometers.

Telegraph companies were formed in many cities. By 1861 telegraph wires stretched from the Atlantic to the Pacific. In Europe too, Samuel Morse's system became popular.

But telegraph wires couldn't be hung over an ocean. Messages to and from Europe had to be sent by ship — a journey of two or three weeks. A new method was needed.

The Atlantic Telegraph Company which was organized in 1856 wanted to try to lay a cable on the floor of the Atlantic Ocean. The 4,000-kilometer cable broke three times. Each time a new cable had to be made. Finally, on July 27, 1866, the first transatlantic message was sent from Newfoundland to Ireland.

Later cables were laid to Central and South America. After 1900 transpacific cables were laid to Asia and Australia. At last news and business information could be sent instantly to almost every country in the world.

Text 4C

Прочитайте текст и ответьте на следующие вопросы:

1. Какие биографические факты из жизни изобретателя телефона приведены в тексте?

2. Какие другие факты, кроме приведенных, вы знаете об изобретателе телефона?

3. Что нового вы узнали из текста? Соотнесите факты, относящиеся к истории развития телефонной связи, со следующими датами: 1877 г. и 1915 г.

Telephone

Alexander Graham Bell never planned to be an inventor, he wanted to be a musician or a teacher of deaf people (глухих). The subjects that he studied at school included music, art, literature, Latin and Greek. They did not include German which all scientists used in their books. Alexander's mother was a painter and a musician. His father was a well-known teacher of deaf people.

When Alexander was only sixteen, he became a teacher in boy's school in Scotland. He liked teaching there, but he still wanted to become a teacher of deaf people as his father.

He read all the books about sound that he could find and started to work on some of his own experiments.

At twenty five Alexander became interested in finding a way to send human voice through an electric wire. The parents of his pupils contributed money for the equipment. He found an assistant, Tom Watson, who worked in an electrical shop. For two years Tom and Alexander were working together to build a machine that people could use to talk to one another over long distances. After two years, the two young men were becoming discouraged (опустились руки). Then, one day, when they were working on a new transmitter Alexander spilled some acid (пролить кислоту) on himself. Tom Watson, who was alone in another room, heard a voice. The voice was coming through a wire to a receiver on the table! The voice was Alexander Bell's! It was saying: «Come here, Mr. Watson. I need you!»

The first telephone line was built in Germany in 1877. By 1915 a telephone line was opened in the United States — 5,440 kilometers from New York to San Francisco.

Now design bureaus all over the world are conducting experiments to develop video-phone or picture phone. A young man in Moscow wants to speak to his friend in Vladivostok. He lifts his telephone receiver, dials a number. After a very short time his friend answers. As he picks up his receiver, his picture appears on the screen. They can speak to each other face to face because they are using a new kind of telephone which may be called «a video-phone». In addition to the usual telephone, the equipment includes a small television screen (14 cm by 13 cm) and, combined with the screen, a television camera. The camera tube will allow the user to switch from a wide view of the room to the face of the person speaking. The focus can be changed to give clear pictures of objects 0.3, 0.9 and 6.0 meters away from the camera. There is also a mirror attachment, which allows the camera to scan documents which may be lying on the table. The camera adjusts itself automatically to different lighting conditions.

Text 4D

Прочитайте и перескажите текст.

Talking via Space

Communication has come a long way from the time when an Indian beat a drum (барабан) in the forest to the time when a scientist receives messages from a satellite. In this space age communication has become a highly developed field. The system of communica-

tion in large countries is unthinkable today without space satellites. Besides large distances, there is a great time difference: the territories of some countries comprise up to 11 zones. Satellites help to minimize all the difficulties that may appear. They rapidly transmit TV and radio programs to different towns, cities, and distant areas.

Space systems and electronic technology have made it possible to set up an automatic system of communication designed for rapid transmission of all kinds of information.

People write letters and send telegrams. But at the same time people living in various cities like to exchange (обмениваться) news on the telephone. Statistics reports that the number of long-distance telephone calls is about 2, 000 million per year. A person in Moscow talking on the phone with Vladivostok must know that this conversation is carried on through a satellite.

Trains and cars can use mobile radio telephones to make calls. Businessmen can use fax machines which provide electronic transmission of documents and messages over telephone lines. Even photographs can be sent and received over telephone wires.

Practically all the population in large countries can watch TV via satellites. The orbital communication systems make it possible for people from different continents to see and hear one another.

The importance of space means of communication is increasing every year. The communication satellites of the international organization «INTERSAT» enable people to keep reliable telephone, telegraph, telex and fax communication in any weather with ships practically in every part of the World Ocean.

ДОПОЛНИТЕЛЬНЫЕ ЗАДАНИЯ

Упражнение 1. А. Прочитайте следующие выражения из текста 4А и постарайтесь догадаться о значении выделенных слов и словосочетаний.

1. TV sets began coming off factory **assembly lines**
2. on people's life and way of **thinking**
3. it weighed less than a **pound**
4. the desired **channel**
5. when you are **occupied**

В. Подберите к каждому выделенному слову или словосочетанию соответствующее ему по значению.

- a. unit of weight
- b. programme
- c. busy with smth.

- d. where parts of large machines are put together in mass production
- e. the way you think

Упражнение 2. Найдите в тексте слова *cell*, *network*, *area*, *set* и выберите правильное значение.

A cellular phone (cellphone) is a lightweight, portable radio transceiver, which can transmit and receive telephone calls anywhere in cellular network area. It is a mobile telephone, which communicates through base stations situated in areas called cells. Cell is a subdivision of communication area in a cellphone network. In the network, the same frequencies can be used for many different telephone calls at the same time. Each cell has its own small electronic base station and set of transmission frequencies. The sizes of the cell vary between 1 km to about 30 km across, depending on the output power of the cellphone transmitter.

1. cell
 - a) a small room for one person
 - b) apparatus for producing electricity by chemical action
 - c) a compartment in a larger structure (e.g., in a honeycomb)
2. network
 - a) a system of lines that cross
 - b) a complex system of interconnected radio and TV devices
 - c) a connected system
3. area
 - a) a zone, region, district
 - b) surface measure
 - c) range of activity
4. set
 - a) a number of smth. of the same kind
 - b) radio, TV, phone apparatus
 - c) direction

Упражнение 3. Подберите к глаголам и словосочетаниям в колонке А глаголы с тем же значением из колонки В.

A	B
1. link up to	a. contain
2. exchange news	b. connect
3. send a signal, message, fax	c. replace
4. show	d. make it difficult and impossible to read
5. take the place of	e. own
6. have, possess	f. communicate
7. make it illegible	g. transmit
8. have	h. indicate

Упражнение 4. Замените выделенное слово или словосочетание другим словом с тем же значением.

1. A Fax system can now **send** texts, graphics and documents to several places **at the same time** in less than a minute. The information may have photographic images as well as words. The latest Fax machines must be **linked up** to a special digital phone line. A few seconds' interference (помехи) on the phone line can make several lines of a document or text **illegible**.

2. Digital systems of information transmission **have taken the place** of analog systems in the last 25 years.

3. Most phones now **have** memories to store frequently used numbers. Some telephone manufacturers make phones with LCDs (liquid-crystal displays) which **show** the duration of calls.

4. Before World War II few people **had** television sets.

5. A lot of people **have** cellphones, answerphones and mobile phones now.

6. It is possible to **exchange news** with people in most parts of the world by telephone.

Упражнение 5. Заполните пропуски глаголами *connect, transmit, communicate* и их производными.

1. A small radio receiver called a radiopager makes it possible for people to ... with each other wherever they are.

2. Data ... services, known as teletext ... text and graphics over a long distance as part of the television video signal.

3. In telecommunication the information can be directed between ... and receivers by cables of various kinds.

4. The lines which ... telephones within a building are the simplest type of ... line.

5. Mobile phone systems normally do not ... directly with other mobile phones. They send messages to the control base station.

6. How long will the ... of the new telephone take?

7. You can now ... your computer to computers all over the world by means of the Internet.

Упражнение 6. А. Назовите 10–15 слов и словосочетаний на тему «Means of communication».

В. Speak about:

Your favourite TV programmes at the moment.

Do you often watch football match live (as it happens) on TV or do you watch recorded **highlights** (parts of the game after it has been played)? Do you enjoy watching **the commercials** (the advertisements in programmes)? Do you watch satellite TV and/or cable TV?

LESSON 5

Определения

Определительные придаточные предложения

Слова *carry* и *mean* и словосочетания с ними

Суффиксы *-ive*, *-ure*

Префикс *super-*

Text 5A. *Is there an End to the Computer Race?*

Text 5B. *Computers Concern You*

Text 5C.

Text 5D. *The Library of Congress*

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

Упражнение 1. Переведите словосочетания, обращая внимание на разные способы выражения определения.

a new invention, to be of great importance, books available in this library, at this time, our professor's lectures, the building of their institute, an institute's library, a television programme, our central TV programme, the first television set, the first pocket-size colour television set, today's shows, a tiny nine-by-twelve inch box, the 1939 World Fair, a reading room, people living in different time zones of the country, modern TV sets appearing now, a written text, a factory built in Siberia, an article to translate, the first to translate those texts.

Упражнение 2. Укажите предложения, где выделенное слово является определением.

1. Complex systems of **radio** transmission networks have been set up throughout the world. 2. Scientists all over the world were quick to realize the importance of **radio** and contributed much to

its further development. 3. The Russian scientist A.S. Popov worked much at the problem of **radio** communication. 4. It is necessary to **radio** the latest news to distant parts of the country. 5. The system of **communication** in any country is unthinkable today without satellites. 6. Electronic technology has made it possible to set up automatic **communication** systems. 7. A new international orbital system provides telephone, telegraph and telex **communication** with ships practically in every part of the World Ocean. 8. It is known that a **photon** is a particle of light. 9. Some specialists expect that a **photon** can greatly increase the operation of a computer. 10. **Photon** computers are quite possible in the not so far future.

Упражнение 3. Найдите определения в предложениях и переведите их.

A. 1. There are twenty-five students in our group, five students got excellent marks for all their exams. 2. Students studying at our institute must know mathematics well. 3. The device made at our laboratory will be used in industry. 4. It is a short and easy text, our students don't need a dictionary to translate it. 5. Scientists working at new computers have a lot of different problems to solve. 6. A citizen of our country was the first to circle the globe. 7. The first television black-and-white pictures produced a sensation in 1939. 8. A tiny nine-by-twelve inch box was displayed at the 1939 World Fair. 9. Now we can see many different radio and TV sets in every house. 10. Computers of different types and sizes have appeared in every country of the world.

B. 1. Materials necessary at present to produce supercomputers are difficult to make. 2. A system capable of transmitting long distance messages was developed at the end of the last century. 3. People present at the World Fair in New York were interested in the new invention. 4. Some general engineering subjects difficult for the first-year students are necessary for studying specialized subjects.

Упражнение 4. Назовите подлежащее придаточного определительного предложения, переведите и укажите, где можно опустить союзное слово.

1. Morse invented a code that used dots and dashes for letters of the alphabet. 2. Al. Bell found an assistant who was a specialist in electrical engineering. 3. They wanted to build a machine which people could use to talk over long distances. 4. A television screen and camera that will be used with a usual telephone are very small. 5. People who come to the Aircraft Fair in Paris see new designs of aircraft from different countries. 6. Bell did not know German

which most writers of scientific and technical papers used at the time. 7. The decimal system that was developed by French scientists was introduced in Russia by D.I. Mendeleev.

Упражнение 5. Измените предложения, где это возможно, согласно образцам и переведите.

A. Например: *The experiments **which Popov made** were discussed at the University meeting. The experiments **Popov made** were discussed at the University meeting.*

1. Newton's great work which was published in 1687 is called «Principia». 2. The Russian Chemical Society which is named after Mendeleev was organised more than a century ago. 3. The subjects that the students study in the first and second years are very important for their future speciality. 4. The invention which Popov made did not interest the government.

B. Например: *The laboratory **in which the students will work** is in a new building. The laboratory **which the students will work in** is in a new building. The laboratory **the students will work in** is in a new building.*

1. The film about which we were told had been made several years before. 2. The magazine in which a very interesting article is published is available in our library. 3. The material of which this instrument is made is a new one. 4. This is a subject about which we don't know much. 5. The cosmonauts about whom we heard so much came to our town. 6. Have you seen the main components which the new device consists of?

Упражнение 6. Найдите бессоюзные определительные придаточные предложения, переведите их.

1. The building our students live in is not far from the institute. 2. Bell was making his experiment in a room next to the room Watson worked in. 3. For a long time Bell couldn't get the results he was looking for. 4. The discovery of Newton's mistake we shall read about was made by a young physicist. 5. When Roentgen made his discovery the room he was experimenting in was dark. 6. The plant this material is produced at is in the Urals. 7. The problem this article deals with is connected with the subject we study. 8. It is difficult to imagine the world we live in without radio, television and telephone.

Упражнение 7. Определите, являются ли выделенные слова существительным или глаголом. Назовите подтверждающие это признаки.

1. this **means** that; this **means**; it **means**; new **means**; this **means** is. 2. this **increase** is; this **increases**; it **increases**; nothing **increases**;

its **increase**. 3. these **results**; this **results** in; both **results**; this **result**; both **result** in; it **results** from.

Упражнение 8. Переведите выделенные словосочетания, обращая внимание на различные значения слова *carry*.

1. During the course of study students **carry out** practical work in well-equipped laboratories. 2. People **are carried** by airplanes, ships, trains and cars equipped with electronic devices. 3. Intensive work and research **are being carried out** on new robots in many countries. 4. A new computer **carries out** a few hundred thousand calculations in a few seconds. 5. Peter, help me **carry** this heavy box, please.

Упражнение 9. Найдите русские эквиваленты для следующих словосочетаний.

to be in general usage; electronically controlled; in other words; of a few square millimetres; commonly; the more ..., the more; operation by operation; according to; advantage over; a thousand times faster.

согласно; размером в несколько мм; с электронным управлением; чем больше ..., тем больше; являться общеупотребительным; операция за операцией; обычно; в 1000 раз быстрее; другими словами; преимущество по сравнению.

СЛОВООБРАЗОВАНИЕ

Упражнение 10. А. Переведите следующие производные слова:

глагол или существительное + -ive = прилагательное

to act — действовать → active — деятельный

intensity- интенсивность → intensive- интенсивный

to conserve — conservative, progress — progressive, effect — effective, mass — massive, to react — reactive;

суффикс существительного -ure

nature — природа; culture — культура

structure, manufacture, future, measure, feature, agriculture;

префикс super- (сверх, супер)

supernatural — сверхестественный; superpower — сверхдержава

supergenius, supercomputer, superman, supermarket, super-sonic, superhot, superconductor.

В. Образуйте и переведите производные слова согласно образцу:

префиксы micro-, mini- (микро-, мини-)

microscope — микроскоп, microscopic — микроскопический

computer, chip, electronics, fiche, film, phone, processor, wave, organism;

minimum — минимум, minimal — минимальный,

minimize — минимизировать, сводить к минимуму

computer, screen, tour, bus, skirt, -sized.

Упражнение 11. Прочитайте и переведите интернациональные слова.

computer, supercomputer [ˈsju:pækəmˈpju:tə], general [ˈdʒenərəl], millions, electron, electronics, electronic instrument, electronically controlled machines [məʃi:nz], airplane, globe [ˈgləʊb], millimeter, center, operation, components [kəmˈpəʊnənts], materials [məˈtɪəriəlz], laboratory [ləˈbɒrətəri], modern, seconds, physical [ˈfɪzɪkəl], limit, specialists [ˈspeʃɪəlists], photons [ˈfəʊtɒnz].

Упражнение 12. Прочитайте и запомните произношение слов.

race [reɪs], usage [ˈju:zɪdʒ], device [dɪˈvaɪs], circle [ˈsə:kl], world [wɜ:ld], circuit [ˈsə:kɪt], undoubtedly [ʌnˈdaʊtɪdli], require [rɪˈkwaɪə], quality [ˈkwɒlɪti], quantity [ˈkwɒntəti], purity [ˈpjʊərɪti], produce [prəˈdju:s], throughout [θruˈaʊt], reliable [rɪˈlaɪəbl], whole [həʊl], perform [pəˈfɔ:m], simultaneously [ˌsɪməˈteɪnjəsli], basic [ˈbeɪsɪk], available [əˈveɪləbl], research [rɪˈsə:tʃ], expect [ɪksˈpekt].

СЛОВА И СЛОВСОЧЕТАНИЯ ДЛЯ ЗАПОМИНАНИЯ

according to *adv* — согласно, соответственно

available *a* — доступный, имеющийся в распоряжении

beam *n* — луч

built-in *p.p.* — встроенный

by means of *prp* — посредством, при помощи

calculation *n* — вычисление

generation *n* — поколение

go on *v* — продолжать (ся)

machine-tool *n* — станок

matter *n* — дело, вопрос

ordinary — обыкновенный

perform *v* — выполнять,

делать, исполнять

quality *n* — качество

reliable *a* — надежный

capable *a* — способный
circuit *n* — схема, цепь
close *a* — близкий, тесный
complete *v* — завершать
control — управлять, контролировать
depend on *v* — зависеть от
fast *a* — быстрый

require *v* — требовать(ся)
speed *n* — скорость
surround *v* — окружать
task *n* — задание, задача
up to *prp* — вплоть до
usage *n* — использование
whereas *conj* — тогда как, в то время как

Текст 5А

Прочитайте текст и прокомментируйте его заголовок. Прав ли автор, дав такой заголовок? Найдите в тексте соответствующие факты. Переведите.

Is there an End to the Computer Race?

Today the word «electronics» is in general usage. Millions of people have electron watches. There are a lot of various radio and TV sets, video cassette recorders and CD players in our houses. In factories and plants we are surrounded with electronically controlled machines and instruments, we are carried by airplanes, ships, trains and cars with built-in electronic devices, and satellites circle the globe. In other words, we are living in an electronic world.

And the center of this world is a tiny silicon plate¹ of a few square millimetres, an integrated circuit², or a chip³, as it is more commonly known. The integrated circuit is undoubtedly one of the most sophisticated⁴ inventions of man, science and technology. It is in the heart of every electronic device and the more cassette recorders, TV sets and computers we need, the more integrated circuits are required.

When we speak about a further development of computers we mean not only quantity, but also high technology⁵ and high speed. As the operation of an integrated circuit depends on microscopic «components», the purity of all materials and the cleanness at the plant they are produced at must be of the highest quality. A continuous search is going on in laboratories throughout the world for more perfect, reliable and high speed electronic circuits.

In the past it took⁶ scientists and researchers a whole lifetime to make a few thousand calculations, whereas for a modern computer this task is a matter of a few seconds. At present computers capable of performing billions of operations a second are required. Supercomputers are different from ordinary computers. The ordinary computer does the computations operation by operation, while the

supercomputer operates like a brain: all operations are being done simultaneously.

In the next few years engineers will complete the work on computers of above 2 billion operations a second. It will take a few more years to produce a 10-billion operations computer. The fifth-generation computers performing 100 billion operations a second will become available in the near future. Is there an end to this race?

According to some researchers, we are close to what can be regarded as a true physical limit. But other specialists think that photons will make the operation a thousand times faster. This means that in the future it will be possible to expect the appearance of photon computers and that computations will be done by means of light. Light has several advantages over electronics: light beams are faster, travel in parallel lines and can pass through one another without interference⁷. Already, the optical equivalent of a transistor has been produced, and intensive research on optical-electronic computers is being carried out in a number of countries around the world. In a few decades a new age of light may replace the still youthful electronic age. The race is going on.

Notes to the Text

1. silicon plate — кремниевая пластина
2. integrated circuit — интегральная схема
3. chip — кристалл
4. sophisticated — сложный
5. high technology — передовая технология
6. it takes ... (one year) — требуется
7. interference — взаимное влияние, помехи

УПРАЖНЕНИЯ

Упражнение 13. Просмотрите текст 5А и ответьте на вопросы.

1. What is this text about?
2. What new things appeared in people's everyday life after World War II?
3. What is at the center of all these things?
4. What applications of computers do you know?
5. Where else (еще) may computers be used?
6. How does an ordinary computer (a supercomputer) operate?
7. What is the speed of a new supercomputer?
8. What is the task of engineers in the field of computer development?
9. What types of computers do you know?
10. What are the prospects in the development of computers?

Упражнение 14. Укажите, какие из следующих утверждений соответствуют содержанию текста 5А.

1. Nowadays an integrated circuit is the main component of everyday device. 2. Supercomputers are in general usage now. 3. The operation of integrated circuits depends on their microscopic component quality. 4. Some researchers think that we are close to a physical limit in increasing computer operation speed. 5. Supercomputers are similar to ordinary computers. 6. By the beginning of the 21st century the electronic age may replace the light age. 7. It is possible to expect the appearance of optical-electronic computers in the future.

Упражнение 15. Найдите в тексте 5А цепочки существительных-определений, состоящих не менее чем из трех компонентов, выделите основное слово и переведите.

Упражнение 16. Найдите в третьем абзаце текста 5А бессоюзное определительное придаточное предложение и переведите его.

Упражнение 17. Укажите, чем выражено определение в предложениях.

A. 1. Yesterday we watched a very late TV programme of a football match. 2. Y.Gagarin made the world's first space flight on April 12, 1961. 3. It was announced that 1000 well-equipped sport clubs could be opened in this country. 4. Our electronics and radio electronics industry have developed from the country's only radio laboratory in Nizny Novgorod. 5. This country has powerful energy systems with the world's largest hydro and thermal power stations and nuclear plants. 6. How can architects solve the problem of living in a region where night lasts for several months and where the temperature may be between 40 °C and 50 °C?

B. 1. The experiments carried out by Bell and Watson didn't give any positive results for a long time. 2. D.K. Chernov laid the foundation of the science dealing with metals. 3. In many countries scientists interested in electricity wanted to find out whether it could be used for a long distance communication. 4. Articles published by Franklin in 1752 dealt with electricity. 5. Communication satellites used by all countries make intercontinental television transmission possible.

C. 1. Nowadays computers capable of performing billions of operations a second are required. 2. People present at the demonstration of Popov's invention were sure of its great future. 3. Wind and solar energies available throughout the earth must be used for useful purposes. 4. Russian engineers have developed the cargo airplane

«Ruslan» capable of carrying load up to 150 tons. 5. Computers available everywhere nowadays make our life easier.

D. 1. Polzunov was the first to construct a steam engine. 2. Mendeleev was the first to make a classification of chemical elements. 3. The thermometer is a device to measure temperature. 4. Faraday was the first to invent a dynamo. 5. A telephone set is a device to reproduce sounds.

E. 1. Materials new computers depend on must be of the best quality. 2. The number of components supercomputers consist of is great. 3. The plants computer components are produced at must be superclean. 4. The laboratory the Curies worked in was very primitive. 5. The space laboratory the Russian cosmonauts live and work in is in the orbit for a long time. 6. Satellites our communication goes through are sent into space regularly. 7. The problem Bell was interested in was not an easy one and it took several years to solve it. 8. The problem this article deals with is connected with the subject we study. 9. The changes and movements of the air we are surrounded with influence our lives. 10. This is an article that deals with some environmental problems we face.

УПРАЖНЕНИЯ ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ

Упражнение 18. Образуйте слова с префиксом *super-* и переведите их.
man, power, genius, hot, hard, natural, conductor.

Упражнение 19. Найдите слова с отрицательным значением.

true, unusual, important, disappearance, incapable, information, undiscovered, capable, untrue, changing, usual, undetected, unimportant, appearance, detected, discovered, intention, possible, include, impossible, disadvantages, imagine, unchanging.

Упражнение 20. Определите, к каким частям речи относятся слова.

superconductivity, superconductive, quality, qualitative, qualitatively, quantity, quantitative, quantitatively, pure, purity, manufacture.

Упражнение 21. Назовите производные от следующих слов, переведите их.
electron, operate, compute, calculate.

Упражнение 22. Расположите слова в алфавитном порядке.

still, start, specialist, speed, speak, second, search, science, sophisticated, surround, supercomputer, ship, simultaneously.

Упражнение 23. Назовите исходную форму слов.

factories, carried, living, more, depends, components, highest, took, qualitatively.

Упражнение 24. Найдите в колонке В эквиваленты словосочетаниям из колонки А.

А	В
1. to make faster	a. many
2. able	b. supercomputer
3. a lot of	c. to improve
4. at present	d. capable
5. to make better	e. nowadays
6. to be different from	f. to increase
7. a computer which does all operations simultaneously	g. to differ
8. it takes	h. it requires

Упражнение 25. Найдите антонимы.

simple, untrue, begin, sophisticated, reliable, efficient, close to, true, complete, low, disadvantage, far from, high, unreliable, inefficient, advantage.

Упражнение 26. Переведите выделенные слова и запомните их.

1. In the past «Engineer» **meant** a designer of engines. 2. The word «a means» **means** «средство». 3. **The meaning of** «telemetry» is «measuring at a distance» and is a combination of Greek and Latin words. 4. **By means of** satellites we can communicate with any country of the world. 5. There were no **means of** direct communication before the telephone was invented. 6. By communication we **mean** various ways to send information. 7. Scientists reported that we had technical **means** to use more channels on a TV set. 8. The importance of space **means of** communication is increasing every year. 9. By what **means** is speech transmitted over a distance? 10. **By means of** telephone people communicate with each other at great distances. 11. The **mean** distance between these two objects is not known yet.

Упражнение 27. Заполните пропуски словами *few* или *a few*.

1. ... people know that the first programmer in the world was Lord Bayron's daughter. 2. In the past astronomers spent all their lives to make ... hundred thousand calculations. 3. A calculator makes these calculations in ... seconds. 4. In the next ... years a

new generation computer will be developed. 5. ... people read that the first electric light illuminated the laboratory of Vasily Petrov, a St. Petersburg physicist, in 1862.

Упражнение 28. Обратите внимание на перевод слова *which*.

1. In our institute the study of theory is linked with practical training, which is very important for future engineers. 2. Students have industrial training at various plants, which allows them not only to watch production processes, but also to take part in production. 3. It is now possible to find a book or an article in this library very quickly, which is extremely important for specialists. 4. Pierre Curie studied the properties of crystals, which led him to the discovery of the piezoelectric phenomenon.

Упражнение 29. Переведите следующие предложения, обращая внимание на неопределенные местоимения.

1. There are some students in the room now. 2. Are there any students in the classroom now? 3. Everybody knows that one can find any book in the Lenin library, 4. There are no students in the classroom now. 5. I was looking for the new reference book on physics everywhere, but couldn't find it. 6. I must have some paper, I can't write anything. 7. This man knows something, but he does not want to tell us. 8. I have seen you somewhere before. 9. No one said anything to us about it at the meeting. 10. In our institute library I always find everything I need. 11. We could park our car nowhere. 12. They found nobody at home. 13. I have been nowhere this summer. I had no vacation. 14. Every faculty at our institute has a computer.

Упражнение 30. Дайте недостающие формы глаголов, запомните их.

won, rung, driven, run, fed, laid, read

Упражнение 31. Прочитайте и переведите без словаря.

Let's look at the progress the computers have made in their development. Besides the great changes in size and speed, we now have machines which change numbers into pictures, words and sounds. The next big change will be when we get computers that will understand human language. But now if you want to programme your own computer, you must learn its language. It does not understand yours. For example you talk with an Englishman. You make one small grammar mistake «have» instead of «has». The man understands what you mean and the talk goes on. But if you make even the smallest mistake in computer language, the talk breaks down and you must go back to the beginning.

CONVERSATION

Exercise 1. Answer the questions.

1. What influences the operation of an integrated circuit? (the quality of microscopic components it consists of) 2. What is the function of a computer? (making a great number of calculations at a very high speed) 3. What will be the speed of the fifth-generation computers? (100 billion operations a second) 4. What can increase the operation speed many times compared to the present computers? (a photon) 5. What physical phenomenon can be used to improve a computer's speed? (light) 6. What are the advantages of light for computation purposes over electronics? (the capability to move faster, in parallel lines and pass one another)

Exercise 2. Make a sentence out of the two parts.

1. Nowadays electronic devices	1. airplanes, ships, trains and cars having built-in electronic circuits and instruments.
2. We are surrounded	2. is being used more widely at home and in office.
3. There are	3. without electronically controlled machine-tools.
4. A personal computer	4. with electronics everywhere in everyday life and at plants and factories.
5. People are carried by	5. scientific research without computers.
6. The modern production is unthinkable	6. are in general usage.
7. It is impossible to imagine	7. electronic watches we wear, telephone, radio, and TV sets we speak, listen to and watch.

Exercise 3. Read and learn.

Computers

- Mary: Have you seen an interesting advertisement (реклама) in the last issue of «The Economist»?
- John: I have not read it yet.
- M.: The School of Engineering offers a new programme in information system. Applications are invited for jobs in this field.

- J.: Professor Smith has told me about it. This programme is interesting. It is designed to meet the needs of persons with a computing background for their work in management and industry.
- M.: Don't you think that our son can lecture on this new programme?
- J.: Why not? He graduated from the Department of Computer Science and for some years was taking part in the research project connected with the problems of supercomputers and their manufacturing.
- M.: As far as I remember his research interests cover software (программное обеспечение) and application.
- J.: And what do they say about the contract?
- M.: It is a three years' contract and it may be extended for further two years. I'll write Mike a letter.
- J.: It's too long. You'd better call him.
-

- A.: How do you like these new electronic games?
- B.: I am crazy (mad) about them. And you?
- A.: Really, I don't know what you see in them.
- B.: Well, I think a real computer game resembles real life as closely as possible, doesn't it?
- A.: May be you are right, but I am not sure.
- B.: Oh, but I find them rather relaxing for a change and try to spend every spare (свободное) minute playing.

Exercise 4. Speak about:

1. The application of electronics in everyday life.
2. New developments in computers.

Use exercise 1, 2 and the following words and word combinations for your topic: to be in general usage, research is going on, throughout the world, further development, high speed electronic circuits of the highest quality, according to some researchers, a photon computer, by means of light, advantage over, in a few decades.

Exercise 5. Comment on the following statement.

Electronic games are very popular today. There are already up to 10,000 different computer games in the world.

Exercise 6. Read and smile.

Andrew Jackson's Poor Health

After his wife died Andrew Jackson, former President of the United States, became increasingly irritable (раздражительный). He also worried (беспокоиться) more and more about his health.

Several members of his family had died after a paralytic stroke (паралич) and Jackson was sure he was going to die in the same way. He therefore lived in daily fear (страх) of getting such a stroke. One day, during a party at his home, he was playing chess with a young woman. Suddenly Jackson's hands dropped to his side, his face became white. Several friends run to him. «At last it has come», Jackson said weakly. «I have had a stroke. My whole right side is completely paralyzed.» «How do you know?» someone asked. «Because», Jackson said, «in the last few minutes I have pinched (ушибнуть) my leg several times and there is absolutely no sensation in it». «Oh, I beg your pardon, sir», said the young woman he played with, «but it was my leg you were pinching.»

Text 5B

Прочитайте текст и найдите информацию об использовании компьютеров в повседневной жизни и работе людей. Выпишите и переведите определенные придаточные предложения.

Computers Concern You

When Ch. Babbage, a professor of mathematics at Cambridge University, invented the first calculating machine in 1812, he could hardly have imagined the situations we find ourselves in today. Almost everything in modern world is done with the help of computers — the complicated descendants (потомки) of his simple machine. Computers are being used more and more extensively in the world today, for the simple reason that they are far more efficient than human beings. They have much better memories and can store (запоминать) great amount of information and they can do calculations in a fraction of the time required by a human mathematician. No man alive can do 500,000 sums in one second, but a modern computer can.

In fact, computers can do many things we do, but faster and better. They can control machines at factories, work out tomorrow's weather and even play chess, write poetry or compose music. Let's look now at some of the ways in which computers concern people in their daily lives and work.

Many people associate computers with the world of science and mathematics, but they are also a great help to scholars in other subjects: in history, literature and so on. It is now possible for a scholar to find a book or an article he needs very quickly, which nowadays when a million or more new books are published each year is quite an advantage. You tell the computer which subject

you are interested in and it produces any microfiche (микро-фише, диамикрокарта) you need in seconds.

There are also systems which are being developed to translate articles from foreign magazines by computer and to make up many lists of information which are needed in a modern library. So, computer can help us to deal with the knowledge explosion in many ways. One can imagine a time when libraries will be run by computers, without human beings at all.

Or, let's take another example. When a man drives a car for long distances he has two problems: to keep the car at a constant speed and watch that he does not run into the car in front of him. Engineers are now experimenting with a system which has a computer control of these two problems. The car's computer keeps the speed constant. At the same time the distance between the car and any other car in front of it is measured by a beam of light transmitted forwards. The beam meets the rear reflectors of the car in front and it is reflected back, which enables to measure the distance. This information is fed to the computer which adjusts (регулировать) its speed control accordingly.

Текст 5С

Прочитайте текст и озаглавьте его. Кратко изложите основное содержание текста по-английски.

Sir Isaac Newton was a supergenius of science who among other things invented calculus (исчисление), stated the laws of gravity and optics. But it turned out (оказываться) Newton also made mistakes. The University of Chicago announced recently that R. Garusto, 23, a physicist, had discovered in one of Newton's calculations an error that had been undetected for three centuries.

The young scientist discovered it while he was studying Newton's masterpiece (шедевр) of physics «Principia» (1687). Newton had derived (выводить) a figure for the Earth's mass based on his new theory that a single force — gravity — governed (управлять) falling bodies on the Earth and the motion of planets around the Sun. The calculation depended on the angle (угол) between two lines from the Earth to the Sun, but because that angle was not exactly known at the time, Newton used slightly different figures in «Principia». It was that mistake that the young scientist found, a discovery that was soon confirmed (подтвердить) by other physicists. The mistake has no influence on Newton's theory, but its discovery was enough to get him a prize from the University of Chicago.

Text 5D

Прочитайте текст и расскажите по-английски, из каких зданий состоит комплекс Библиотеки Конгресса и каким известным деятелям посвящено каждое из них. Найдите предложения со словами *houses* и *numbers*, переведите и запомните их значения.

The Library of Congress

The Library of Congress is the Nation's library in the USA. It serves not only to members and committees of the Congress, but to libraries throughout the USA and the world and to the scholars, researchers and scientists who use it.

Its foundation was laid in 1815 when President Thomas Jefferson offered his personal library accumulated for 50 years and considered one of the best in the United States at that time as the basis for a great national library.

Now the Library of Congress complex on Capital Hill includes three buildings. The Thomas Jefferson Building, which has been built in Italian Renaissance style, is the oldest of them. It was the largest and costliest (роскошный) library building in the world when it was completed in 1897. It is decorated with splendid sculpture, murals (фрески) created by 50 American artists. Its Main Reading Room is 160 feet high.

The Room houses a collection of 45,000 reference books (справочники), a part of the extensive main catalog of more than 23 million cards and desks for 212 readers. The Computer Catalog Center provides public access (доступ) to the Library's automated catalog.

The simply designed John Adams Building faced with white marble (мрамор) was opened in 1939. Sculptures on its large bronze doors represent 12 famous writers.

The white marble James Madison Memorial Building opened in 1980 more than doubled the Library's available Capitol Hill space. The building which is the official memorial to the Nation's fourth President contains the James Madison Memorial Hall, exhibition areas, eight reading rooms, offices and storage areas for collections which number over 50 million items (предметов).

ДОПОЛНИТЕЛЬНЫЕ ЗАДАНИЯ

Упражнение 1. А. Прочитайте следующие словосочетания из текста 5А и постарайтесь догадаться о значении выделенных слов в данном контексте.

1. the **word** «electronics» is in general usage
2. more **perfect** electronic circuits

3. **billions** of operations
4. what can be **regarded** as
5. the still youthful electronic **age**

В. Подберите к каждому выделенному в А слову или словосочетанию соответствующее ему по значению.

- a. excellent, exact, accurate
- b. combination of written symbols forming vocabulary of a language
- c. consider
- d. great or long period of time with special characteristics
- e. one thousand million (GB), 10^9 (US)

Упражнение 2. Прочитайте текст и найдите эквиваленты следующим словам и словосочетаниям:

1. number
2. tiny
3. not likely to change
4. signal to ring a bell at a fixed (certain) time
5. divide into two equal parts
6. watch that is used to time sport events, such as a race, to a fraction (small part) of a second
7. a place between the hand and the arm
8. not fast, slowly
9. smth. that helps smb. to remember, not to forget
10. start or begin a process
11. Hertz (Hz)
12. speed

Digital Watch

In a digital watch the mechanical parts of the traditional mechanical wristwatch have been replaced by a vibrating quartz crystal to keep time. The vibrating quartz crystal is controlled by minute electronic circuits. One of the advantages of quartz is that it is very stable. The artificial quartz crystals used in digital watches are designed to vibrate up to 32,768 cycles per second when the current from a battery is passed through them.

These vibrations produce electric pulses. As the pulses travel through the electronic circuits of the microchip, their rate is gradually halved. The result is a pulse rate of one per second.

Each one-second pulse triggers the microchip to send signals to the liquid crystal display to advance the numerals by one second. The pulses are also used to control different functions. Such a digital watch can show the day and date; it can have an alarm and a reminder and can act as a stopwatch with an accuracy of 1/100th second.

Упражнение 3. Прочитайте следующие определения компьютерных терминов, дайте русские эквиваленты выделенных слов и словосочетаний. Переведите предложения.

1. **Hardware** means the different types of equipment a computer consists of.

2. A computer's hardware comprises a **central processing unit (CPU)** which is the heart and brain of the computer.

3. **Input and output devices** capable of putting information into a computer and getting it out of it are types of peripheral equipment. **Peripherals** are the units connected to the CPU: input devices, output devices and storage devices.

4. The simplest and most common type of input device is a keyboard, containing a typewriter **keyboard**.

5. A **laser printer** is a kind of output device to print information.

6. **Software** means the programs needed to operate computer equipment.

7. These programs are on **disks**, the **hard disks** inside the computer, or **floppy disks**, or on **CD-ROMs**, that is, Compact Disk Read Only Memory, which you can put on or store a large amount of information. A **disk** is a storage device made of flat circular plates with magnetizable surfaces. A **hard disk** is a disk made from a solid magnetic material and used as a storage device. A **floppy disk** (also called diskette) is a disk made of flexible plastic material upon which data are stored on magnetic tracks. **Tracks** are areas marked on the surface of a disk. A **disk drive** is the electronic mechanism that actually reads what is on a disk. In hard disks, the disk and the drive are built into a single unit.

8. A **word processor** is a computer used to write documents, letters and reports, or the software that is used for this purpose.

9. **Databases** are programs, which allow you to store, look at or change a large quantity of information quickly and easily.

10. **Graphics** are pictures and symbols a computer program can produce.

11. An extra copy on a floppy disk is called a **back-up copy**, a copy of data or software, usually kept in case the original disk is damaged or destroyed.

12. A **bug** possible in a computer operation, also a virus is a software problem or error in a program. **Debugging** means correcting program errors or bugs.

13. People send **e-mail** (electronic mail) messages with the help of the **Internet**, a system that lets computers connect by telephone lines.

14. A **laptop** is a portable computer weighing about 2–4 kg.

15. With a device called the **mouse** you can do a number of things by **clicking** on different **icons**.

16. A **mouse** is a small input device, on the top of which there are one or more buttons for communicating with the computer.

17. **Clicking** is a basic mouse action to place a cursor to close a window, etc.

18. An **icon** is a small picture representing an object, process or function.

Упражнение 4. Заполните пропуски, образуя общеизвестные компьютерные термины. Запомните их.

1. data ...	12. mini ...
2. integrated ... or chip	13. ... copy
3. soft ...	14. fifth ... computer
4. ... ROM	15. ... processor
5. hard ...	16. e-...
6. floppy ...	17. ... age
7. ... disk	18. photon ...
8. input, output ...	19. ... writer
9. super ...	20. key ...
10. physical ...	21. laser ...
11. ... network	22. mini ...

Упражнение 5. Заполните таблицу на словообразование.

Verb, Noun	Adjective
create	...
...	possessive
act	...
compete	competitive
attract	...
...	comparative
expense	...
sense	...
mass	...

Упражнение 6. Назовите прилагательные с суффиксом *-ible/-able*, означающие:

- 1) that can be done, can exist, happen;
- 2) that cannot be done, cannot exist, happen;

- 3) that can be used;
- 4) that may be obtained, can be used;
- 5) that may be relied on;
- 6) that cannot be relied on;
- 7) which may be questioned;
- 8) which may not be questioned;
- 9) absolutely essential.

Упражнение 7. Заполните таблицу на словообразование.

Noun	Adjective	Adverb
...	...	questionably
availability	...	—
capability	...	...
...	usable	—
...	...	possibly
reliability	...	...
quality	...	...
quantity	...	...
...	...	intensively
indispensability	...	—

Упражнение 8. А. Назовите 15–20 ключевых слов и выражений на тему «Computer».

В. Speak about:

1. A lot of people are becoming computer **literate** (have experience of working with computers and know how to use them). Are you computer literate? Do you find most computers «**user-friendly**» (easy to use)?

2. The Internet and its influence on our daily life. Can it help people from different countries to learn English?

LESSON 6

Модальные глаголы и их эквиваленты

Глагол *to cause*

Сочетания *no longer, because of, due to, thanks to*

Суффиксы *-ness; -ance/ence; -ist; -ful; -less*

Text 6A. *Made in Space*

Text 6B. *Composite Ceramics*

Text 6C. *Ancient Steel-Making Secret*

Text 6D. *The British Museum*

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

Упражнение 1. Прочитайте диалоги, обращая внимание на употребление модальных глаголов.

A: You can do without lots of things.

B: You can't do without food or water.

A: Oh, yes, you can! You can do without food for weeks and without water for days.

B: Well, you can't do without air or only for a very short time.

A: Can you write without a pen?

B: No, of course, I can't.

A: I must have a new dictionary.

B: Why must you? You don't need a new dictionary. You've got a lot of dictionaries.

A: I want to see Mr. Z.

B: I am sorry. I am afraid he may not be in.

A: But perhaps he may be.
B: No, sir. He may not be back for some time.
A: I can wait.
B: He may not be in until twelve.
A: I can wait until he is in.
B: He may be out all day.

A: May I go to the cinema?
B: No, not today, tomorrow.
A: May not I go today? Zed can't come tomorrow. May I go home with Zed afterwards?
B: Oh, no, you mustn't do that.
A: Why, mustn't I?
B: Because you mustn't be home late.
A: Well, then, may Zed come home with me?
B: Yes, he may do that.
A: May I have the money, please.
B: Oh, very well.

Упражнение 2. Замените модальные глаголы соответствующими эквивалентами.

1. Students must take exams in January. 2. She can speak French well. 3. You may take this book till tomorrow. 4. We must learn new words every week. 5. I live not far from my work. I can go by bus or I can walk. 6. You may come in. 7. We can take this book from the library. 8. She cannot do this work in time. 9. He must go to St. Petersburg for a few days. 10. We can see electrical devices everywhere.

Упражнение 3. Поставьте предложения в вопросительной и отрицательной формах.

1. We were able to read that article in the library. 2. Some students will be permitted to take exams in December. 3. You have to read this book. 4. We shall be able to skate in winter. 5. My friend is to take part in the conference. 6. The students of our group had to go to the plant last week. 7. They were allowed to continue their research.

Упражнение 4. Переведите предложения, обращая внимание на перевод модальных глаголов.

1. Everyone should know a foreign language. 2. To make supercomputers, we need highly developed electronics and new materials. 3. One should do one's work in time. 4. The students ought to know the history of their institute. 5. The development of

new materials does not mean that old materials should lose their significance. 6. Marie Curie needed a laboratory and equipment for her research. 7. Every institute ought to be proud of their famous graduates. 8. One should know that «roentgen» is a unit (единица) of radiation.

Упражнение 5. Замените *would* на *used to*, где возможно, и переведите.

1. He would spend hours in the Tretyakov Gallery. 2. Tsiolkovsky believed that rockets would be used for space travel. 3. Bell and Watson would repeat their experiments many times. 4. It became known that a new car would be shown at the exhibition. 5. Electricity would pass through metals, but wouldn't pass through wood. 6. I asked my friend to help me, but he wouldn't, he said I could do everything without his help. 7. He would work in the library when he was getting ready for his exam.

Упражнение 6. Выберите правильный модальный глагол или его эквивалент.

можно вычислить — (must, can, should) calculate; быть в состоянии выполнить — (have to, be able to, be allowed to) carry out; нельзя предсказать — (can't, needn't, be not able to) predict; должны начаться в 10 — (have to, may, be to) begin at 10; следует знать — (should, may, need) know; не нужно создавать — (may not, needn't, should not) create; необходимо использовать — (must, be allowed, may) use; можно взять эту книгу — (must, can, may) take this book; упорно не желать сделать — (need, wouldn't, must) do.

Упражнение 7. Переведите предложения.

1. Он может читать и писать по-английски. 2. Она должна сделать эту работу в конце месяца. 3. Теперь студенты могут войти в аудиторию. 4. Она может заниматься здесь. 5. Он должен прочитать эту статью. 6. Можно мне взять ваш учебник? 7. Я должен пойти в библиотеку и взять книги. 8. Можно мне поехать с вами? 9. Умеет (может) этот ребенок ходить? 10. Вы должны вернуть книгу завтра.

Упражнение 8. Переведите выделенные словосочетания.

1. **It was found that** proton and neutron have almost the same weight. 2. **It was necessary** to lay cables across the Atlantic Ocean as there were no radio or satellites at that time. 3. **It is difficult** to imagine the world we live in without radio, telephone and televi-

sion. 4. **It is possible** to have a direct telephone talk with Vladivostok with the help of satellite systems. 5. This material has properties which **make it useful** for various space projects. 6. **It should be said that** computers become increasingly important in our life and work. 7. My adviser **considers it necessary** for me to read as much literature as possible before starting my work. 8. **It is difficult** to name all the branches of science and technology which are based on electronics. 9. **It is well-known that** «watt» is a unit named after James Watt, an inventor from Scotland. 10. **It is impossible** to solve many modern complex engineering problems without the help of computers.

Упражнение 9. Укажите, чем выражено отрицание. Переведите.

1. Popov had no support from the government to continue his research. 2. Not long ago chemists developed new materials that could withstand high temperatures. 3. No system of measurement of the past is as simple as the metric system. 4. It is no longer possible to put off the solution of ecological problems. 5. Tsarist Russia gave no money for Tsiolkovsky's research. 6. No one is allowed to smoke in our office. 7. There is no doubt (несомненно) that the development of electronics is one of the greatest achievements of mankind. 8. Half a century is not a long period in the history of civilization. 9. Before Newton no one could explain why the planets moved around the Sun. 10. People no longer think of radio and television as something fantastic.

Упражнение 10. Переведите предложения с составными предлогами *due to, thanks to, because of*.

1. Ships can communicate over long distances due to the radio. 2. Because of the earth's rotation there are days and nights on the earth. 3. Thanks to the radio it is possible to transmit human voice across the globe. 4. Due to the latest achievements in electronics it has become possible to develop supercomputers. 5. Because of their long life solar and atomic batteries are used to supply power to transmitters in spacecrafts. 6. Thanks to the development of radio telescopes radio astronomy has made great achievements. 7. Our century can be called «Space Age» because of the development of a new branch of science and technology — cosmonautics.

Упражнение 11. Переведите предложения, обратив внимание на слово *much* перед прилагательным в сравнительной степени.

1. We don't notice the gravitational pull of a book because the pull of the earth is much greater. 2. The speed of computer opera-

tions will be much greater in the future. 3. Graphite which withstands much higher temperatures is one of the best materials for reactors. 4. When a spaceship is in space, much smaller energy is needed for its movement.

Упражнение 12. Переведите предложения и запомните значения глагола *to cause*.

1. Heating causes different changes in metals. 2. A Danish scientist discovered that electricity caused the needle to move from left to right. 3. Vibration not only causes noise but can also break materials and structures. 4. The space flight of Gagarin caused a sensation throughout the world. 5. Rutherford showed that positive charge of a nucleus was caused by protons. 6. New achievements in mathematics caused the development of new means of computerization.

Упражнение 13. Найдите английские эквиваленты для русских словосочетаний.

в большем масштабе; пилотируемые и непилотируемые космические аппараты; проводить эксперимент; на борту космического корабля; преимущества состояния невесомости; условия невесомости; материалы нового поколения; получить полезные и ценные данные.

carry out experiments; zero gravity conditions; at a larger scale; zero-gravity state advantages; on board a spacecraft; manned and unmanned space vehicles; obtain useful and valuable data; new generation materials.

СЛОВООБРАЗОВАНИЕ

Упражнение 14. А. Образуйте и переведите следующие производные слова согласно образцу:

существительное + -ful = прилагательное

use — польза → useful — полезный

power, skill, success;

существительное + -less = прилагательное

use — польза → useless — бесполезный

change, noise, water, help, end;

прилагательное + -ness = абстрактное существительное

weightless — невесомый → weightlessness — невесомость

useful, dark, hard, weak;

существительное или прилагательное + -ist = существительное
science — наука → scientist — ученый
special, art, motor, biology.

В. Переведите существительные с суффиксами *-ance/-ence* :

resistance — сопротивление
consequence, distance, appearance, difference, absence, presence.

Упражнение 15. Прочитайте и переведите интернациональные слова.

surprise [sə'praɪz], substance ['sʌbstəns], magnetic [mæg'netɪk], laser ['leɪzə], polymer ['pɒlɪmə], plastics ['plæstɪks], experiment [ɪks'perɪmənt], orbital ['ɔ:bɪtl], expert ['eksɜ:t], start [stɑ:t], simulate ['sɪmjələteɪt], principle ['prɪnsɪpl], gravitational [ˌgrævɪ'teɪʃənl], convection [kən'vekʃən], temperature ['temprɪtʃə], zero-gravity ['ziərəʊ'grævɪtɪ], hydromechanical [ˌhaɪdrəʊmɪ'kænikəl], acceleration [æk'selə'reɪʃən], project ['prɒdʒekt].

Упражнение 16. Прочитайте слова.

label ['leɪbl], material [mə'tɪəriəl], alloys ['ælɔɪz], peculiar [prɪ'kju:ljə], numerous ['nju:mərəs], pave [peɪv], vehicle ['vi:ɪkl], inertia [ɪ'nə:ʃjə], process ['prəʊses], Archimedes [ˌɑ:krɪ'mi:di:z], consequently ['kɒnsɪkwəntli], separate ['sepəreɪt], component [kəm'pəʊnənt], quite [kwɑɪt], gases [gæsɪz], cause [kɔ:z], research [rɪ'sə:tʃ], biochemist [ˌbaɪəʊ'kemɪst], biological [ˌbaɪəʊ'lɒɡɪkəl], special ['speʃəl].

СЛОВА И СЛОВСОЧЕТАНИЯ ДЛЯ ЗАПОМИНАНИЯ

aim *v* — стремиться, целить(ся)

alloy *n* — сплав

approach *v* — приближаться, подходить

certain *a* — определенный

condition *n* — условие

create *v* — создавать

consequently *adv* — следовательно

launch *n* — запуск

liquid *n* — жидкость, *a* — жидкий

manned *p* — пилотируемый, с человеком на борту

movement *n* — движение

numerous *a* — многочисленный

obtain *v* — получать

possess *v* — обладать, владеть

data <i>n</i> — данные	thus <i>adv</i> — так, таким образом
density <i>n</i> — плотность	valuable <i>a</i> — ценный
differ from <i>v</i> — отличаться от	prove <i>v</i> — доказывать
difference <i>n</i> — различие, разница	substance <i>n</i> — вещество
estimate <i>n</i> — оценивать	surface <i>n</i> — поверхность
except <i>prp</i> — кроме, за исключением	vehicle <i>n</i> — транспортное средство, космический летательный аппарат
i.e. [that is] — то есть	weight <i>n</i> — вес
include <i>v</i> — включать	

Текст 6А

Прочитайте текст и найдите абзацы, в которых сообщается о результатах и значении проведенных экспериментов по производству материалов в космосе. Переведите

Made in Space

This label «Made in Space» for industrial materials will probably surprise no one in the not so distant future. They may include superconductors, new kinds of alloys, substances with peculiar magnetic properties, supertransparent laser glass¹, polymers, plastics, and so on. Numerous experiments carried out at the Russian orbital space stations have paved the way² to the development of methods and means of industrial production of new materials of better quality on board a spacecraft³. Experts estimate that within a few coming years industrial production of various materials will be started in space.

Conditions on board a space vehicle orbiting Earth greatly differ from those on its surface. However, all of these conditions can be simulated⁴ on Earth, except for one — prolonged weightlessness. Weightlessness can be created on Earth, but only for a few seconds. A space flight is another matter: a satellite orbiting Earth is in a dynamic zero-gravity state, i.e., when gravity is cancelled out⁵ by inertia.

What can weightlessness be used for? Many well-known processes go on differently due to the absence of weight. The Archimedes principle is no longer valid and, consequently, stable-state⁶ liquid mixtures can be obtained, the components of which would immediately separate on Earth because of different density. In case of melts⁷ of metals, glasses or semiconductors, they can be cooled down to the solidification point even in space and then brought back to Earth. Such materials will possess quite unusual qualities.

In space there is no gravitational convection⁸, i.e., movements of gases or liquids caused by difference of temperatures. It is well-known that various defects in semiconductors occur because of convection. Biochemists also have to deal with the worst aspects of convection, for example, in the production of superpure biologically active substances. Convection makes it very difficult on Earth.

Following the launch of the first orbital stations the specialists started experiments aimed at proving the advantages of the zero-gravity state for the production of certain materials. In this country all orbital stations from Salyut 5 onwards were used for that purpose, as well as rockets. Since 1976 over 600 technological experiments have been carried out on board manned and unmanned space vehicles.

The experiments proved that many of the properties of the materials obtained under the zero-gravity condition were much better than those produced on Earth. Besides, it has been established that it is necessary to develop a new science — physics of the weightless state — which forms the theoretical basis for space industry and space materials study. This science has basically been developed. The methods of mathematical modelling of the hydromechanical process under the zero-gravity condition have been created with the help of computers.

Special space vehicles will also be needed for industrial production of new-generation materials. Research has shown that the acceleration rate on board these vehicles must be reduced to the minimum. It was found that space platforms in independent flight carrying the equipment were most suitable for producing materials. These vehicles will have to use their own propulsion systems to approach their base orbital station after a certain period of time. The cosmonauts on board the station can replace the specimens. Many new and very interesting projects are planned for orbital stations. Here is one of them. Convection does not allow to grow large protein crystals on Earth. But it is possible to grow such crystals under the zero-gravity condition and to study their structure. The data obtained during the experiments can be useful for the work of laboratories on Earth in using the methods of gene engineering⁹. Thus, it may be possible to make new materials in space and also to obtain valuable scientific data for new highly efficient technologies on Earth.

Preparatory work for industrial production in space at a larger scale is being carried out in Russia, the USA, Western Europe and

Japan. It should be said that according to the estimates of American experts production of materials in space is to bring 60 billion dollars in the future.

Notes to the Text

1. supertransparent laser glass — сверхпрозрачное лазерное стекло
2. to pave the way — проложить путь
3. on board (a spacecraft) — на борту (космического корабля)
4. to simulate — моделировать, имитировать
5. to cancel out — уничтожать, уравнивать
6. stable-state — устойчивое состояние
7. in case of melts — в случае расплавов
8. gravitational convection — гравитационная конвекция (перенос тепла под действием силы тяжести)
9. gene engineering — генная инженерия

УПРАЖНЕНИЯ

Упражнение 17. Просмотрите текст 6А и ответьте на вопросы.

1. What is this text about? 2. Have you seen the label «Made in Space» anywhere? 3. Why can't certain materials be produced on Earth? 4. Can all the conditions on board a space vehicle be simulated on Earth? 5. When will it be possible to start industrial production of materials in space? What do you think about it? Can we start such production now? 6. Why can we obtain materials of better quality in space? 7. What equipment is needed for producing materials in space? 8. How will this equipment operate?

Упражнение 18. Составьте утверждения, выбрав правильный вариант согласно тексту 6А.

1. Many well-known processes go on differently in space due to
 - a) different density.
 - b) the presence of weight.
 - c) the absence of weight.
2. The components of stable-state liquid mixtures would separate on Earth because of
 - a) high temperature.
 - b) different density.
 - c) different conditions.

3. It is well-known that various defects in semiconductors occur because of

- a) weightlessness.
- b) solidification.
- c) convection.

Упражнение 19. Найдите в тексте 6А модальные глаголы и их эквиваленты. Замените эквиваленты соответствующими модальными глаголами.

Упражнение 20. Выберите соответствующий модальный глагол.

1. Do you live far? (Can, must) we meet here at 7 o'clock? — We certainly (may, can). — I'll see you later this evening, then.
2. Bill, would you help me? Sure, I'd be glad to help you. What (may, can) I do for you?
3. (Can, may) I take your pen? I've broken mine.
4. Do you know when Bob comes back from the University? I am afraid he (can, may) be very late. He has an examination tomorrow. He (can, must) study for the examination.
5. Do you have a stamp (марка)? — No, I'm afraid I don't. You (may, must) go to the post office for this.
6. I'm very much interested in environment problems. I think we (must, may) learn to live in harmony with nature.

Упражнение 21. Укажите предложения с модальными глаголами, выражающими необходимость совершения действия. Переведите.

1. As telegraph wires couldn't be hung over the ocean, cables had to be laid on the floor of the Atlantic Ocean.
2. In the next few years engineers are to develop computers of more than 2 billion operations a second.
3. A new kind of telephone may be called a video-phone.
4. One must know that we shall need a lot of specialists that will be able to work and live in space for a long time.
5. To see distant objects clearly, one should change the focus.
6. Within a few coming years a quantity production of various materials is to begin in space.
7. Some liquid mixture components would immediately separate on Earth because of different density.
8. It should be said that special space vehicles are necessary for industrial production of space materials.
9. Our group will be allowed to use new laboratory equipment next term.
10. One can see that there is no principal difference between iron and copper as conductors.

Упражнение 22. Найдите предложения с эквивалентами модальных глаголов *to have to*, *to be to*.

A. 1. Television has a great number of uses nowadays.
2. Morse discovered that telegraph messages did not have to be written, they

could be sent as a sound. 3. That part of this country has become a highly industrial one. 4. Why couldn't you do it yesterday? — Because I had to go home earlier than usual. 5. This important problem had been solved by the end of 1980. 6. In the past messages to and from Europe had to be sent by ship. 7. Some materials with useful qualities will have to be produced in space. 8. A historian has to study a lot of various facts to be able to reconstruct the far past.

B. 1. Such metals as iron, cobalt, nickel and some alloys are much more magnetic than any other substances. 2. In the next few years Russian engineers are to complete the work on supercomputers. 3. The main aim of this article is to explain methods and means of space industrialization. 4. We are living in an electronic world. 5. A number of TV stations are to be linked up into a network. 6. Experiments for industrial production of materials in space are being carried out in many countries. 7. Weightlessness is created on Earth, but only for a few seconds. 8. The quality of these metal parts is to be very high. 9. It was found that the acceleration rate on board such vehicles was to be reduced to a minimum.

УПРАЖНЕНИЯ ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ

Упражнение 23. Определите, к каким частям речи относятся слова, и переведите их.

requirement, constituent, scientific, distance, agronomist, ancient, density, differ, hardness, structural, various, magnificent, presence, property, culture, conductor, presentation, probably.

Упражнение 24. Напишите глаголы, соответствующие словам.

surprisingly, difference, equipment, mixture, coming, estimation, weightlessness, production, separately, development, movement, disappearance, functional.

Упражнение 25. Образуйте прилагательные от существительных.

magnet, industry, absence, speciality, weight, probability, orbit, dynamics, preparation, supertransparency, independence, gravitation, superpurity, difficulty, variety.

Упражнение 26. Переведите слова, учитывая значение префикса *super-*.

supercritical, superactive, supercooled, superalloy, superhard, superplastic.

Упражнение 27. Дайте для следующих слов:

а) синонимы

to start, movement, nowadays, quality, research, various, a means, manufacture, possess, to occur, consequently, numerous, spacecraft, to use, to substitute, certain;

б) антонимы

distant, to stop, few, to reduce, invaluable, unusual, dependence, minimum.

Упражнение 28. Выберите английский эквивалент русского предложения из предлагаемых вариантов.

1. Он должен идти домой.

He may go home. He must go home. He had to go home.

2. Он должен идти домой в 5 часов.

He must go home at 5 o'clock. He is to go home at 5 o'clock.
He may go home at 5 o'clock.

3. Он может идти домой в 5 часов.

He may go home at 5. He can go home at 5. He must go home at 5.

4. Он должен будет идти домой раньше.

He must go home earlier. He should go home earlier. He will have to go home earlier.

5. Ему следует идти домой.

He should go home. He may go home. He had to go home.

6. Он может очень быстро ходить.

He can walk very quickly. He will be able to walk very quickly.
He could walk very quickly.

7. Ему разрешат идти домой после трех.

He is permitted to go home after 3. He was permitted to go home after 3. He will be permitted to go home after 3.

8. Ему не нужно идти домой сразу.

He is not allowed to go home at once. He could not go home at once. He needn't go home at once.

Упражнение 29. Заполните пропуски словами *because* или *because of*.

1. She must go by bus every morning ... she lives far from the institute. 2. The students cannot translate this text ... it is difficult. 3. The planes could not leave the airport ... the bad weather. 4. Our life has become easier ... the electricity. 5. Critics would say that the young people were too passive ... they watched TV so much.

Упражнение 30. Дайте недостающие формы глаголов, запомните их.

lost, risen, pay, leading, struck, sat.

Упражнение 31. Переведите без словаря.

The first step in any industrialization project, for example, on the Moon should be preparation for plant construction. It is economically desirable to use local materials for this. It is well-known that metals form the most important group of engineering materials. One must know that they possess necessary mechanical and physical properties. They can be easily fabricated into various forms by a variety of techniques. They are hard, tough (пластичный), strong and temperature-resistant, a combination of properties not available in any other materials. The properties of metals can be changed by heat treatment so that the fabrication is much easier since the work pieces can have properties quite different from those needed in the final product.

CONVERSATION

Exercise 1. Answer the questions.

1. What condition on board a space vehicle can't be simulated on Earth? (prolonged weightlessness). 2. What eliminates gravity during a space flight? (inertia). 3. What can be the industrial use of weightlessness? (the production of new materials with unusual properties). 4. What industrial materials can be produced in space? (superconductors, new kinds of alloys, magnetic materials, laser glass, polymers, plastics, etc). 5. What is Russia's contribution to the development of methods and means of industrial material production in space? (over 600 technological experiments carried out at the Russian orbital space stations). 6. What are the results of these experiments? (much better properties of the materials obtained under the zero-gravity condition than those produced on Earth). 7. What is needed for industrial material production in space? (special space platforms).

Exercise 2. Make a sentence out of the two parts.

1. Experts estimate that within a few coming years

1. for industrial production of new-generation materials at a larger scale is being carried out in Russia, the USA, Europe and Japan.

2. Numerous experiments on board

2. very difficult on Earth.

3. They may include	3. i.e. movement of gases or liquids because of difference of temperatures.
4. In space there is no gravitational convection	4. to grow large crystals and to study their structure.
5. Convection makes the production of some materials	5. super and semiconductors, metals, glasses, superpure biologically active substances, etc.
6. But in zero-gravity conditions it is possible	6. the industrial production of various materials is to begin in space.
7. It should be said that research and preparatory work	7. the Russian manned and unmanned space vehicles and space stations proved the advantages of the zero-gravity state for the production of some materials.

Exercise 3. Read and learn.

Tom: Are you going to attend the seminar tonight?

Bill: I should go. Unfortunately, I won't be able to do so.

T.: Why should you go there?

B.: The speaker will talk about composite ceramics. I must know all about this subject. As you know, I'll do some experimental work in this field next June. So I'll have to know about it.

T.: In that case, you ought to cancel (отменить) your other plans and attend the seminar. You shouldn't miss (пропускать) it.

B.: You are right. But I can't go.

T.: Why can't you?

B.: Don't you remember (помнить)? We are to take an exam in French tomorrow. I have to study for the examination.

T. Do you have to study? Is it a necessity?

B.: Well, I suppose the expression «have to study» is too strong. No one is forcing me. But I really ought to study tonight. Shouldn't you do it too?

T.: I don't have to study. I studied last night and I am sure I can pass it. Besides that, I must attend the seminar.

B.: Why must you attend it?

T.: Have you forgotten? I must introduce the speaker to the audience.

B.: Yes, that's right.

T.: Well, I have to go now. I may be late. I'll see you later.

Exercise 4. Speak about:

1. Space industrialization and its importance for mankind.
2. The latest achievements in industrial materials production in space.

Use exercises 1, 2 and the following words and word combinations for your topic : carry out experiments; obtain useful and valuable data; on board a space vehicle; zero-gravity condition; zero-gravity state advantages, materials of better quality; at a larger scale; in case; according to.

Exercise 5. Read and smile.

The teacher was trying to explain the fundamentals of Science to her class. «Sir Isaak Newton was sitting under a tree looking up into it when an apple fell on his head, and from that he could discover the law of gravity. Wasn't that wonderful?»

«Yes, it certainly was», a pupil said, «and if he had been at school at his books, he wouldn't have discovered anything».

A Trick on a President

W.H. Harrison was the ninth President of the United States. Like so many other early American presidents he was born in a small town. As a boy, he was extremely quiet. In fact, he was so quiet that he had the reputation of being very stupid (глупый). The town people therefore often used to play tricks (шутка) on him. For example, they would put a nickel and a dime (монеты в 5 и 10 центов) in front of him and tell him to take whichever one he wanted. He would always choose the nickel and they would laugh at him.

One day, a woman took pity (пожалеть) on him. She said: «William, why do you always choose the nickel instead (вместо) of a dime? Don't you know that a dime, though smaller in size than a nickel, is worth (стоять) much more than a nickel?» «Certainly I know it», William answered. «But if I chose the dime, they wouldn't play the trick on me any more.»

Text 6B

Прочитайте текст и расскажите о новом способе повышения пластичности и износостойкости режущего инструмента из композиционной керамики.

Composite Ceramics

Advanced ceramic materials have such interesting properties that mechanical engineers are becoming more and more interested in their use as structural parts (конструкционные детали).

Ceramic cutting tools have been in use for some time. However, it is only during the last twenty years that there has been rapid development in this field because of the development of new composite ceramics.

Composite materials are materials in which two or more different substances, such as metals, ceramics, glasses, or polymers are combined without chemical reaction. As a result one can produce a material with properties different from those of any of the individual constituents. The constituents of a composite would retain their individual characteristics.

Recently engineers have developed various kinds of composite ceramics which must combine an increased toughness (пластичность) with the same hardness and strength of usual ceramics. A promising recent development is the addition of a tiny quantity of metal to increase toughness and tool life. Thus, at room and high temperatures (1000 °C) the composite ceramics for cutting tools should possess the following properties: high strength, high toughness, high hardness, high thermal shock resistance and high chemical inertness.

Text 6C

Прочитайте текст, выделите интересные для вас факты и перескажите.

Ancient Steel-Making Secret

When two metallurgists at Stanford University were trying to produce a «superplastic» metal they became interested in the secret of Damascus steel, the legendary material used by numerous warriors (воины) of the past, including Crusaders (крестоносцы). Its formula had been lost for generations.

Analyses of a new steel revealed properties almost identical to those they found in Damascus steel, although their own plastic steel had been produced by present-day methods.

The remarkable characteristics of Damascus steel became known to Europe when the Crusaders reached the Middle East in the 11th century. They discovered that swords (меч) of the metal could split (рассечь) a feather (перо) in air and at the same time retain their edge sharp through many battles.

The secrets of Damascus steel were known in many parts of the ancient world, especially in Persia, where some of the finest specimens were produced. For eight centuries the Arab sword makers kept the secret about their techniques and methods. And with the invention of firearms (огнестрельное оружие), the secret was lost and it was never fully rediscovered.

The two metallurgists carried out a lot of researches. When they realized that they might be close to the discovery of a new material, a sword fancier (знаток), at one of their demonstrations, pointed out that Damascus steel, like their own product, was very rich in carbon. This led them to conduct a comparative analysis of their steel and those of the ancient weapons. As a result, it was found that a basic requirement was a high carbon content. The two metallurgists believed it had to be from 1 per cent to 2 per cent, compared to only a part of 1 per cent in ordinary steel. Their research showed how to make steel of even greater hardness than Damascus steel.

Text 6D

Прочитайте текст. Расскажите по-английски, чем примечателен читальный зал Библиотеки Британского музея и какие отделы имеются в Британском музее.

The British Museum

The British Museum consisting of the National Museum of Archaeology and Ethnography and the National Library is the largest and richest of its kind in the world. Built in the middle of the last century it is situated in central London which consists of quiet squares and streets.

The British Museum was founded by Act of Parliament in 1753 to bring together the collection of Sir Robert Cotton, some others and future addition to them.

Anthony Panizzi designed the famous circular Reading Room at the British Museum. The first thing that strikes a visitor on entering the Reading Room is its unusual shape. It is a perfect circle. The superintendent (управляющий) and his assistant sit in the centre of the room and they issue (выдавать) and collect books. Long rows of reading desks radiate to the outer walls, like the spokes (спицы) of the wheel.

Many famous people have used the Reading Room at the British Museum. Of the many distinguished people who have used the Reading Room no one was perhaps more regular and more intent (целеустремленный) than the German philosopher and socialist Karl Marx. Soon after he arrived in England in 1849, Marx became a daily visitor of the Reading Room, where he used to remain from nine in the morning till closing time.

The British Museum has a department of ethnography. Ethnography is concerned with primitive people and their cultures in various stages of development as revealed by their tools, ritual objects and various crafts (ремесло). This collection is so vast that only a

tiny percentage is on show to the general public. Then there is a department of prints and drawings. There are also departments devoted to maps, coins and medals. Visitors interested in chronology can see a large collection of clocks and watches. Those who are interested in philately can find a magnificent collection of postage stamps.

ДОПОЛНИТЕЛЬНЫЕ ЗАДАНИЯ

Упражнение 1. А. Прочитайте следующие выражения из текста 6А и постарайтесь догадаться о значении выделенных слов и словосочетаний.

1. this **label** «Made in Space»
2. in the not so **distant** future
3. with **peculiar** magnetic properties
4. **prolonged** weightlessness
5. The Archimedes principal is no longer **valid**
6. the theoretical **basis** for space industry
7. **on board** these vehicles; **on board** orbital station
8. **preparatory** work for industrial production in space
9. replace the **specimens**

В. Подберите к каждому выделенному в А слову соответствующее ему по значению.

- a. well based, correct, effective
- b. needed for preparing; introductory
- c. continuing for a long time
- d. foundation
- e. in a ship
- f. not so far away in time
- g. special, particular
- h. piece of paper, metal or other material used to describe what smth. is, where it is to go, etc.
- i. one as an example of a class

Упражнение 2. А. Прочитайте текст и постарайтесь догадаться о значении терминов *shape memory alloy*, *suggest*, *remember*, *piston*, *contract*, *expand*, *engine*.

Shape memory alloys (SMA) are in general usage today. What exactly is a SMA? As the name suggests, this alloy can remember its original shape or form. Essentially it is a metal which can be deformed when cold and will return to its first shape when hot.

The particular alloy we are speaking about is nickel titanium. We can see here one application in a conventional piston. When

the piston is cold, the SMA coil or spring contracts and so the piston does not move. Heat causes it to expand and consequently the piston moves up. The advantage is that the device can work without any mechanical power, just from the heat which is supplied by the engine itself.

В. Найдите в приведенном выше тексте 5 пар синонимов и 3 пары антонимов.

Упражнение 3. Замените выделенные словосочетания соответствующими глаголами *expand, remember, contract, suggest, deform*.

The name SMA **causes us to think** that such an alloy can **keep in memory** its original shape. In other words it can **change its shape**. When cold it **gets smaller**. When hot it **gets bigger**.

Упражнение 4. Составьте возможные словосочетания из глаголов в колонке А и существительных из колонки В, переведите их и запомните.

A	B
1. make	a. the basis, foundation
2. meet	b. application, a way
3. obtain/provide	c. an operation
4. lay	d. an advantage over, influence on
5. state	e. data, results, access to
6. find	f. information, a message, signal
7. develop	g. an experiment, a TV program
8. send/transmit/receive	h. a law
9. have	i. a decision, mistake, calculation
10. perform	j. equipment, a device, design, system
11. watch	k. requirements

Упражнение 5. Составьте, переведите и запомните словосочетания с глаголом *to be*.

famous for, of great importance, in general (common) use (usage), of great help, interested in.

Упражнение 6. Заполните таблицы на словообразование.

Noun	Adjective	Opposite Adjective
use	...	...
thought	thoughtful	...
care	...	...
...	...	hopeless

Adjective	Noun	Noun, Adjective	Noun
hard	...	journal	...
tough	toughness	science	...
useful	...	economy	...
...	uselessness	...	metallurgist
hopeful	...	active	...
...	hopelessness	...	humanist
...	carefulness	chemistry	...
careless	...	...	physicist

Упражнение 7. А. Назовите 10–15 ключевых слов и словосочетаний на тему «Advanced materials».

В. Speak about:
 A new alloy or advanced composite material you have recently read or heard about, its properties and possible uses.

REVISION OF LESSONS 4–6

Упражнение 1. Повторите способы выражения определения. Найдите определения и переведите предложения.

A. 1. This is an excellent computer which will give you many years of service. 2. The number of men present was small. 3. Personal laser printers cost less than ordinary laser printer. They also weigh less and require less space. 4. Do you know the total number of colours available on this graphics system? 5. Supercomputers capable of performing billions of operations a second will have to be developed soon. 6. Ten miles is a long distance to walk. 7. Any mechanic could do that job. 8. Digital television has many features that are absent from conventional TV, such as easy connection to computers and telecommunication networks. 9. E-mail is a very fast data communication service. For e-mail to get a message to the other side of the world is a matter of a second or two. 10. The factory has computer controlled production equipment.

B. 1. Tell me about the report you are preparing now. 2. A new radio set Ted has is a Zenith. 3. Ten hours of work a day is the maximum you should do. 4. Do you know about the disco the University is organising? 5. The news we have heard this week is of great importance. 6. You have been given all the information you need. 7. I collected all the information I could find on the Internet about this subject. 8. With the new system you will be able to generate statistics any time you want. 9. Writing letters and reports are the purposes most people use computers for. 10. Composite materials we learnt about are the combination of metals, ceramics, glasses and polymers produced without chemical reactions. 11. Weightlessness the production of new materials depend on cannot be created on the earth for a long period of time. 12. The TV sets people saw at the New York Fair in 1939 were not available for a long time because of World War II. 13. Metals, ceramics, glasses, polymers composite materials consist of have properties different from those of the obtained composite material.

Упражнение 2. Прочитайте и переведите тексты, обращая внимание на проработанную грамматику и лексику 4, 5, 6 уроков.

The Monitor

We interact with computers by entering instructions and data into them. After the information has been processed (обрабаты-

вать), we can see the results (i.e. the output) on the visual display unit (VDU — устройство виртуального отображения) or the monitor. In this interactive process with the computer, the screen plays an important part.

The pictures and the characters (символы) we see on the screen are made up of picture elements which are also called pixels. The total number of pixels the display is divided in (both horizontally and vertically) is known as resolution. When the number of pixels is very large, we obtain a high resolution display and therefore a sharp image. If the number of pixels is small, a low resolution is obtained. Thus, pixel density or resolution affects the quality of the image: a larger number of pixels gives a much clearer image.

The cathode ray tube of the monitor is very similar to that of a TV set. Inside the tube there is an electron beam which scans the screen and turns on or off the pixels that make up the image. The beam appears in the top left corner, and scans the screen from left to right in a continuous sequence, similar to the movement of our eyes when we read, but much faster. This sequence is repeated 50, 60 or 75 times per second, depending on the system.

In a colour monitor, the screen surface is coated (покрывать) with substances called phosphors. Three different phosphor materials are used — one each for red, green and blue. A beam of electrons causes phosphor materials to give coloured light from which the picture is formed. Colour monitors are capable to display many different colours at the same time.

Portable computers use a flat liquid-crystal display (LCD) instead of a picture tube.

Super Phones

Not long ago it became known that cell phone manufacturers were experimenting with several different designs for the handheld devices that would be linked to the advanced wireless networks of the future. If these machines really are to become digital companions, they will have to be versatile, adaptable and fashionable (модный). Companies such as Nokia, Ericsson and Motorola are working on the third-generation «super phone» that will look quite different from existing cell phones. In fact, calling them phones seems absurd (неразумный). They will have built-in colour screens several inches square for presentation of high resolution graphics and video. Some may have a keyboard and a miniature mouse for data input, but most of them will use touch-sensitive

(сенсорный) screens and styluses (перо, пишущий узел) like those employed now by the handheld computers.

In addition to carrying voice communication, the super phone will also be able to play music files that are circulating on the Web in the most popular MP3 format (or in whatever format may replace it).

Упражнение 3. Объясните значение следующих словосочетаний.

Например: *material properties* — *the properties of a material*;
colour monitor — *a monitor that works in colour*;
company's database — *the database which belongs to the company*.

1. light beams
2. pixel number, pixel density
3. eye movements
4. director's computer
5. printing device
6. new generation computer
7. pocket-sized computer
8. handheld phones
9. high resolution display
10. high speed electronic circuits
11. computer controlled production equipment

Упражнение 4. Подберите к словам из колонки А их объяснение из колонки В.

A	B
1. pixel	a. the maximum number of pixels in the horizontal and vertical directions of the screen
2. monitor	b. the results produced by a computer
3. resolution	c. the smallest element of a display surface
4. character	d. read the image as a series of pixels to enter information into the computer's memory
5. computer	e. the picture tube of the display which is made of glass and contains a vacuum
6. CRT	f. a CRT device which displays the computer output
7. image	g. a symbol available on the keyboard
8. scan	h. the machine that stores and processes data
9. output	i. a picture or what is seen on a television or computer screen

Упражнение 5. А. Заполните пропуски словами:

pixel certain Web stylus chip perform CPU mouse

1. A ... is a tiny piece of silicon containing a set of integrated circuits. 2. The ... directs and coordinates the operations taking place within the computer system. 3. The arithmetic logic units ... calculations on the data. 4. The common name for picture elements is 5. On colour systems, each pixel is a ... combination of the three primary colours: red, green, and blue. 6. ... is a system by which one can navigate through the Internet and find news, pictures, virtual museums, electronic magazines — any topic you can imagine. 7. What makes the ... especially useful is that it is a very quick way to move around on a screen. 8. A ... is a pen-like input device used to write directly on the screen to enter data.

В. Speak about:

The next generation mobile phones.

LESSON 7

Причастия

Независимый причастный оборот

Значения слова *since*

Суффиксы *-age*, *-ate*

Префикс *en-*

Text 7A. *Transport for Tomorrow*

Text 7B. *Car of Future*

Text 1C. *Talking Instrument Panels*

Text 7D. *Testing Times*

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

Упражнение 1. Прочитайте, обращая внимание на употребление времен.

«Have you seen a copy of Magna Charta: collection of old English Laws?» «I haven't seen all of it. I have seen parts of it many times. I saw three or four articles from it yesterday. I read them in the translated form. Old English is almost as difficult to read as a foreign language». «Where did you see them?» «I saw them at the Public Library». «I saw you there. Did you see me?» «No, I didn't see you. I didn't see anyone whom I knew except the librarian. I didn't see any of my school friends, I mean». «I have seen you at the library many times, but you don't see anyone. The teacher says she has seen you there too, but you see only the books which you are reading».

Упражнение 2. Заполните пропуски глаголом *to see* в соответствующем времени.

I ... a friend in the library yesterday. I ... him there many times before, but he was so busy that I did not speak to him. When I spoke to him he said that he ... never ... me at the library. He concentrates on his work. He ... only his book. The teacher ... him

there many times, but he doesn't ... even her. He ... many important facts in books, however, and tells the class about them. He ... and read more important documents than all the rest of our class put together.

Упражнение 3. Переведите следующие словосочетания с Participle I и Participle II:

developing industry, developed industry;
changing distances, changed distances;
a controlling device, a controlled device;
an increasing speed, an increased speed;
a transmitting signal, a transmitted signal;
a reducing noise, a reduced noise;
a moving object, a moved object;
heating parts, heated parts.

Упражнение 4. Найдите причастия, переведите предложения.

A. 1. We need highly developed electronics and new materials to make supercomputers. 2. New alloys have appeared during the last decades, among them a magnesium-lithium alloy developed by our scientists. 3. We are carried by airplanes, trains and cars with built-in electronic devices. 4. Computer components produced should be very clean. 5. Many countries have cable TV, a system using wires for transmitting TV programs. 6. The fifth-generation computers performing 100 billion operations a second will become available in the near future. 7. A video phone has a device which allows us to see a room and the face of the person speaking. 8. New technologies reduce the number of workers needed.

B. 1. Driving a car a man tries to keep steady speed and watch the car in front of him. 2. Having stated the laws of gravity, Newton was able to explain the structure of the Universe. 3. Being more efficient than human beings, computers are used more and more extensively. 4. Having graduated from Cambridge, Newton worked there as a tutor. 5. Having been published in 1687, Newton's laws of motion are still the basis for research. 6. Being invented the digital technology solved the old problems of noise in signal transmission. 7. Having published his book about space exploration in 1895, Tsiolkovsky became known all over the world. 8. Built in the middle of the last century, the British Museum is situated in central London.

Упражнение 5. Определите, какую функцию выполняет слово с окончанием *-ed*, и переведите предложения.

1. The first television set produced quite a sensation in 1939. The first television set produced in 1939 was a tiny nine-by-twelve inch box. 2. Newton's great work published in 1687 is called

«Principia». Newton published his great work «Principia» in 1687. 3. The Russian Chemical Society organized more than a century ago is named after Mendeleev. The Russian Chemical Society organized an international conference devoted to the latest achievements in organic chemistry. 4. The energy possessed by the body due to its position is called the potential energy. The new material possessed good properties. 5. The equipment required to carry out laboratory experiments was very complex. The equipment required further improvement. 6. The car model developed a speed of 50 miles an hour. The car model developed by our student design bureau will be shown on TV.

Упражнение 6. Переведите выделенные словосочетания.

1. **When completed** in 1897, Jefferson's building was the largest and costliest library in the world. 2. **Though being** a school teacher of mathematics all his life, Tsiolkovsky concentrated his attention on man's travel into space. 3. **If compared** to today's TV program, the first black-and-white pictures were rather bad. 4. **While being** a teacher of deaf people Bell became interested in sound and its transmission. 5. **Though discovered**, Newton's mistake had no influence on his theory. 6. **While working at** a new transmitter for deaf people Bell invented a telephone. 7. **If heated** to 100 °C, water turns into steam.

Упражнение 7. Найдите подлежащее независимого причастного оборота, переведите предложения.

A. 1. The room being dark, we couldn't see anything. 2. The book being translated into many languages, everybody will be able to read it. 3. Peter having passed his exams, we decided to have a rest in the country. 4. We went for a walk, our dog running in front of us. 5. The testwork having been written, he gave it to the teacher and left the room. 6. They having arrived at the station early, all of us went to the cafe. 7. My friends decided to go to the park, the weather being warm and sunny. 8. Our library buying all the new books, we needn't buy them ourselves. 9. The fuel burnt out, the engine stopped. 10. Many scientists worked in the field of mechanics before Newton, the most outstanding being Galileo.

B. 1. Numerous experiments having been carried out at the orbital stations, it became possible to develop new methods of industrial production of new materials. 2. President Jefferson having offered his personal library, the foundation of the Library of Congress was laid. 3. Anthony Panizzi designed the Reading Room of the British Museum, the Reading Room being a perfect circle. 4. A beam of light being transmitted forwards, it is possible to measure

the distance between the car and the other cars in front of it. 5. The distance having been measured, the computer adjusts the car's speed. 6. Two metallurgists produced a new superplastic metal, the new steel showing properties identical to Damascus steel. 7. The young physicist having discovered Newton's error, other scientists confirmed it. 8. The first TV sets having been shown in New York, the news about it spread throughout the world.

С. 1. With the first steam engine built in the 17-th century, people began to use them in factories. 2. The inventor was demonstrating his new device, with the workers watching its operation attentively. 3. With his numerous experiments being over, Newton was able to write his work very quickly. 4. With the current being switched on, the machine automatically starts operating.

Упражнение 8. Переведите предложения на английский язык.

1. Читая книгу, он обычно делает заметки (make notes). 2. Прочитав текст, мы обсудим его. 3. Отвечая на вопросы, он сделал несколько ошибок. 4. Ответив на вопросы преподавателя, мы начали переводить новый текст. 5. Являясь хорошим проводником электричества, медь широко используется в промышленности. 6. Увидев зеленый свет, мы перешли (cross) улицу. 7. Покупая газету, он потерял деньги. 8. Купив газету, он пошел к метро.

Упражнение 9. Переведите предложения. Запомните значения выделенных слов.

1. The Reading Room of the Library of Congress **houses** a great collection of reference books. 2. The **Houses** of Parliament are situated in the centre of London on the banks of the Thames. 3. The fuselage of a new cargo aircraft can **house** large-size equipment. 4. Solar power can be used as a source of **heat**. 5. When we **heat** water, it turns into steam. 6. **Heat** energy may be of a kinetic form. 7. A new computerized system **monitors** the production processes of this plant. 8. This plant is equipped with video and television **monitors**. 9. Our laboratory is developing an electronic **monitoring** system for cars. 10. In new cars instrument panels will have a means to **display** different objects on the road. 11. Liquid-crystal **display** was used in the first colour television set. 12. A special electronic device **signals** the engine to stop. 13. Now it is possible to send **signals** over long distances.

Упражнение 10. Определите, в каких предложениях *only* — наречие, а в каких — прилагательное.

1. The higher school today considers education not only as a collection of useful facts and theories but as a process which trains

the mind to think, analyze and make decisions. 2. Halley's Comet is the only comet which has been regularly observed for more than 200 years. 3. Many experts now question the idea that environmental problems began only with the industrial revolution in the 19th century. 4. Since their first appearance in 1939 only few people owned television sets. 5. The collection of ethnography in the British Museum is so vast that only a tiny percentage is on show to the general public. 6. When we speak about the further development of computers, we mean not only quantity, but also high technology and high speed.

Упражнение 11. А. Найдите русские эквиваленты для словосочетаний.

one thing is certain, public transport, the time is coming, from home to office, a modern vehicle, in common use, to get into a car, a pack of cigarettes, how far one can drive, various objects ahead, directly above the bumper, get out of a car.

различные объекты впереди, общественный транспорт, современное транспортное средство, приходит время, сесть в машину, пачка сигарет, от дома до работы, одно явно, в повсеместном использовании, выйти из машины, сколько (как далеко) можно проехать, непосредственно над бампером.

В. Переведите словосочетания.

to go out into the street, a usual means of transport, to get information, to get the best economy, a decade ago, to play a part, the size of a pack of cigarettes, the vehicle's carburetor, an electronic instrument panel, the car's position on a road, objects ahead of the vehicle, stationary objects ahead, ten miles an hour.

СЛОВООБРАЗОВАНИЕ

Упражнение 12. Переведите производные слова согласно образцу:

прилагательное существительное глагол } + -age = существительное

short — короткий → *shortage* — нехватка, недостаток

mile — миля → *mileage* — расстояние в милях

to use — использовать → *usage* — использование
 advantage, breakage, blockage;

суффикс глагола -ate

illuminate — освещать; *sophisticate* — усложнять
 regulate, demonstrate, concentrate, separate, indicate;

префикс en- + прилагательное = глагол
rich — богатый → to enrich — обогащать
to enable, to ensure, to enlarge, to enclose.

Упражнение 13. Прочитайте и переведите интернациональные слова.

public ['pʌblɪk], transport, future ['fju:tʃə], pilot ['paɪlət], role ['rəʊl], carburetor [kɑ:bju'retə], control [kən'trəʊl], display, component [kəm'pəʊnənt], model ['mɒdl], characteristics [kærəktə'rɪstɪks], diagonally [daɪ'æɡənəli], automatic [ɔ:təm'ætɪk], automatically, automobile ['ɔ:təməubi:l], motor ['məʊtə], decade ['dekeɪd], gasoline ['gæsəʊli:n], nature ['neɪtʃə.], to project [prə'dʒekt], Sahara [sə'hɑ:rə], ceramic [sɪ'ræmɪk], radar ['reɪdə].

Упражнение 14. Прочитайте и запомните произношение слов.

vehicle ['vi:ɪkl], drive [draɪv], driver, arrive [ə'raɪv], arrival [ə'raɪvəl], guidance ['gaɪdəns], private ['praɪvɪt], motorway, motorcar, lane [leɪn], luxury ['lʌksjəri], exhaust [ɪg'zɔ:st], device [dɪ'vaɪs], adjust [ə'dʒʌst], fuel [fjuəl], calculate ['kælkjuleɪt], average ['ævərɪdʒ], since [sɪns], feature ['fi:tʃə], aerial ['ɛəriəl], directly [dɪ'rektli], danger ['deɪndʒə], observe [əb'zə:v], warn [wɔ:n], buzzer ['bʌzə], Japan [dʒə'pæn], Japanese [dʒæpə'ni:z], angle ['æŋɡl], axis ['æksɪs], data ['deɪtə], impassable [ɪm'pɑ:səbl], valve [vælv], 5 °C [faɪvdrɪ'gri:z'sentɪgreɪd], engine ['endʒɪn].

СЛОВА И СЛОВСОЧЕТАНИЯ ДЛЯ ЗАПОМИНАНИЯ

adjust *v* — регулировать

angle *n* — угол

apply *v* — применять

avoid *v* — избегать

axis *n* — ось

current *a* — современный, текущий

destination *n* — пункт назначения

detect *v* — обнаруживать

guidance *n* — управление, наведение

ignition *n* — зажигание

indicate *v* — указывать, показывать

make *v* — делать, заставлять

mount *v* — монтировать, устанавливать

only *a* — единственный; *adv* — только

directly *adv* — прямо, непосредственно

engine *n* — двигатель

ensure *v* — обеспечивать, гарантировать

equip *v* — оборудовать

exceed *v* — превышать

exhaust *n* — выхлоп

place *v* — помещать

select *v* — выбирать

size *n* — размер

sophisticated *p.p* — сложный

valve *n* — клапан

warn *v* — предупреждать

withstand *v* — выдерживать

in many respects — во многих отношениях

to look like — быть похожим

to turn on/off — включать/выключать

Text 7A

Прочитайте и переведите текст. Ответьте на следующие вопросы:

Какой вид автомобиля наиболее перспективен для общественного транспорта будущего?

Какие примеры применения электроники в автомобиле приводятся в тексте?

Transport for Tomorrow

One thing is certain about the public transport of the future: it must be more efficient than it is today. The time is coming when it will be quicker to fly across the Atlantic to New York than to travel from home to office. The two main problems are: what vehicle shall we use and how can we plan our use of it?

There are already some modern vehicles which are not yet in common use, but which may become a usual means of transport in the future. One of these is the small electric car: we go out into the street, find an empty car, get into it, drive to our destination, get out and leave the car for the next person who comes along. In fact, there may be no need to drive these cars. With an automatic guidance system for cars being developed, it will be possible for us to select our destination just as today we select a telephone number, and our car will move automatically to the address we want.

For long journeys in private cars one can also use an automatic guidance system. Arriving at the motorway, a driver will select the lane¹ he wishes to use, switch over to automatic driving, and then relax — dream, read the newspaper, have a meal, flirt with his passenger — while the car does the work for him. Unbelievable? It is already possible. Just as in many ships and aircraft today we are pi-

lotted automatically for the greater part of the journey, so in the future we can also have this luxury in our own cars.

A decade ago, the only thing electronic on most automobiles was the radio. But at present sophisticated electronics is playing a big part in current automotive research. For example, in every gasoline-powered² car that General Motors Corporation makes there is a small computer continuously monitoring the exhaust. The device, about the size of a pack of cigarettes, adjusts the vehicle carburetor fuel intake³ to get the best fuel economy. Ford cars are equipped with an electronic instrument panel that, among other things⁴, will calculate how far one can drive on the fuel left in the tank. It will also estimate the time of arrival at destination and tell the driver what speed he has averaged⁵ since turning on the ignition.

According to specialists these features made possible by micro-electronics are only the beginning. Radar may control the brakes to avoid collisions, and a display screen may show the car's position on the road. Recently a radar to be mounted on lorries and cars has been designed in the USA. The radar aerial looks like a third headlight placed directly above the bumper. Having summed up the information about the speed and distance of various objects ahead, the computer detects all possible dangers and their nature. A third component in the system is a monitor on the instrument panel. The radar only observes objects ahead of the vehicle. It is automatically turned on when the speed exceeds ten miles an hour. The green light on the panel indicates that the system is on. The yellow light warns of stationary objects ahead, or something moving slower than the car. The red light and buzzer warn that the speed should go down. Another red light and sound signal make the driver apply the brakes.

A Japanese company is designing a car of a new generation. When completed, the new model will have a lot of unusual characteristics. The car's four-wheel control system will ensure movement diagonally and even sideways, like a crab, at right angles to the longitudinal axis. This is especially important when leaving the car in parking places. To help the driver get information while concentrating on the road, the most important data will be projected on the wind screen. A tourist travelling in such a car will not lose his way even in Sahara with its impassable roads: a navigation Earth satellite will indicate the route.

A new ceramic engine has been developed in Japan. Many important parts as pistons, pressure rings⁶, valves and some others

have been made of various ceramic materials, piston rings⁷ made of silicon materials being in many respects better than those of steel. They withstand temperatures up to 1,000 °C. Therefore, the engine does not need a cooling system.

Notes to the Text

1. lane — ряд
2. gasoline-powered — с бензиновым двигателем
3. fuel intake — впрыск топлива
4. among other things — кроме всего прочего
5. what speed he has averaged — какова была его средняя скорость
6. pressure ring — уплотнительное кольцо
7. piston ring — поршневое кольцо

УПРАЖНЕНИЯ

Упражнение 15. Просмотрите текст 7А и ответьте на вопросы.

1. What is the text about? 2. What kind of a car may be in common use in the near future? 3. How will a public electric car operate? 4. How will it operate on a motorway? 5. What electronic devices are there in a modern car? 6. What electronic devices does General Motors Corporation offer for a car? 7. What electronic devices are Ford cars equipped with? 8. Can a radar be used in a car? What will its functions be? 9. What functions will a Japanese car of a new generation have? 10. What materials do the Japanese offer to use for car motors?

Упражнение 16. Укажите, какие из приведенных утверждений соответствуют содержанию текста 7А.

1. An automatic guidance system was developed for the electric car. 2. Small electric cars are in common use. 3. Many ships and aircrafts are piloted automatically for the greater part of the journey. 4. Usually having arrived at a motorway, a driver switches over to automatic control and relaxes. 5. A decade ago there were many electronic things in the cars. 6. There is no future for microelectronics in automobiles. 7. Recently a radar to be mounted on lorries and cars has been designed in the USA. 8. A new ceramic engine has been developed in France.

Упражнение 17. Найдите в тексте 7А причастия в функциях определения и обстоятельства (см. 3, 5 и 6-й абзацы), независимые причастные обороты (см. 2-й и 7-й абзацы).

Упражнение 18. Найдите причастия и переведите предложения.

1. Studying Newton's work «Principia», a young physicist discovered a mistake in the calculations. 2. Having designed a car radar, the engineers started complex tests. 3. While driving a car one should be very attentive. 4. A new electronic instrument will calculate how far one can drive on the fuel left in the tank. 5. The engine tested showed that it needed no further improvement. 6. Scientists are experimenting with a system allowing drivers to see better after dark. 7. The system being tested will increase the safety and fuel efficiency of a car. 8. Having been tested, the computer system was installed at a plant. 9. Soon the night-vision system designed will be available. 10. The synthetic magnet has a lot of valuable qualities that can be changed, if desired. 11. Recently there have appeared battery-powered cars. 12. The radar used was of a completely new design. 13. Having been heated, the substance changed its properties. 14. Being provided with batteries an electric car can develop a speed of 50 miles an hour. 15. When mass produced, electric cars will help solve ecological problems of big cities. 16. A defect undetected caused an accident. 17. Though first developed for military purposes, radar can be used in modern cars.

Упражнение 19. Найдите предложения с независимым причастным оборотом, переведите.

1. The first engines appeared in the 17th century and people began using them to operate factories, irrigate land, supply water to towns, etc. 2. The steam engine having been invented, a self-propelled vehicle was built. 3. The supply of steam in the car lasting only 15 minutes, the vehicle had to stop every 100 yards to make more steam. 4. After the German engineer N. Otto had invented the gasoline engine, the application of this engine in motor cars began in many countries. 5. The cars at that time were very small, the engine being placed under the seat. 6. Motorists had to carry a supply of fuel, because there were no service stations. 7. Brakes having become more efficient, cars achieved greater reliability. 8. Cars with internal combustion engines having appeared, the automobile industry began to develop rapidly. 9. By 1960 the number of cars in the world had reached 60 million, no other industry having ever developed so quickly.

УПРАЖНЕНИЯ ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ

Упражнение 20. Определите, к каким частям речи относятся слова.

dangerous, automotive, longitudinal, automatically, present, nature, motorist, enrol, enrolment, guidance, average, current, ignition, diagonally, calculate, impossible, graduate, village, public, garage, useful, usefulness.

Упражнение 21. Переведите слова, обращая внимание на значение суффикса *-er/-or*.

driver, sensor, starter, monitor, microprocessor, detector, transistor, carburetor, user, transmitter, lecturer, generator.

Упражнение 22. Назовите производные слова от глаголов, переведите.

navigate, generate, stimulate, estimate, innovate, investigate, regulate.

Упражнение 23. Напишите исходную форму, по которой нужно искать следующие слова в словаре:

companies, easier, accordingly, better, creating, biggest, cried.

Упражнение 24. Сгруппируйте из слов пары:

а) синонимов

regulate, modern, want, select, use, current, wish, average, adjust, choose, mean, apply;

б) антонимов

unbelievable, cooling, continuous, passable, heating, believable, discontinuous, impassable.

Упражнение 25. Переведите предложения и запомните различные значения слова *since*.

1. Since 1770 there were many brilliant inventions in the automobile industry. 2. The production of motor cars in Great Britain was stopped since there were severe speed limits. 3. In early days many of the cars broke since transmissions were still unreliable and often went out of operation. 4. Since conventional headlights are not very effective, a new system has to be developed. 5. Since the French engineer Gugnot invented the first self-propelled vehicle in 1770, the automobile industry developed very rapidly. 6. The number of chemical elements known to science has grown considerably since Mendeleev created his Periodic Table in 1871.

Упражнение 26. Переведите предложения и запомните значение слова *too* (слишком) перед прилагательным.

1. The task is too difficult for them. 2. The size of the device is too big now. 3. The difference in temperatures was too great. 4. The old system is too complicated. 5. A sensor mechanism for a car is too large at present.

Упражнение 27. Переведите предложения и запомните значения слов *future* и *further*.

1. In the future it will be possible to use more channels on every TV set via satellite and cable TV. 2. Scientists throughout the world were quick to realize the importance of the radio and contributed much to its further development. 3. The subjects that the students study in the first and the second years are very important for their future speciality. 4. The use of computers in cars is a further step in improving safety on the road. 5. I'll give you further instructions tomorrow.

Упражнение 28. Заполните пропуски словами *only* или *the only*, переведите предложения.

1. The Earth is ... planet having liquid water. 2. It is useful to remember that the industrial revolution began ... at the end of the 18th century. 3. way to achieve good results is to apply one's knowledge to practical work. 4. The revolution in science and technology affects not ... economically developed countries, but also developing countries. 5. Multi-cylinder engines came into use ... after World War II. 6. The motor car has not ... brought mobility to millions of people, but also has polluted the atmosphere. 7. Weightlessness can be created on Earth, but ... for a few seconds. 8. requirement for plastic steel is that it must be rich in carbon. 9. The Library of Congress serves not ... to Members of the Congress, but also to libraries throughout the US and the world.

Упражнение 29. Заполните пропуски соответствующими формами глагола *to have* (*has, have, had, hasn't, haven't, hadn't*).

«I ... a good car for sale. It ... many extra parts. It ... a good speedometer and four new tires. It ... a new spare (запасная) tire too.» «... it its original paint (краска)?» «No, it ... its original paint. It ... new paint on it. It looks new.» «I a good offer for it yesterday, but the man ... very little cash. I want cash (наличные деньги).» «... it a good engine?» «Yes, it ... an excellent engine. It ... any weak places in it. Engines that ... weak places in them are al-

ways in the garage.» «I ... an idea you will sell your car.» «I ... two good offers yesterday. One man ... all cash. But he doesn't look like an honest man. I ... no desire to do business with him.»

Упражнение 30. Замените придаточные предложения причастным оборотом.

1. While Boris was driving home, he saw an accident. 2. After we had talked with Peter, we felt much better. 3. When John arrived at the station, he saw the train leave. 4. After he had left the house, he walked to the nearest metro station. 5. When I looked out of the window, I saw Mary coming. 6. As we finished our part of the work, we were free to go home. 7. As Ann had had no time to write us a letter, she sent a telegram.

Упражнение 31. Дайте недостающие формы глаголов, запомните их.

driven, learning, said, setting, buy, ridden, break.

Упражнение 32. Прочитайте и переведите без словаря.

A new vacuum-controlled constant velocity carburetor developed by an American company offers several advantages over ordinary carburetors, including 25 per cent gasoline economy, improved engine performance and easier starting. The device having only 54 parts compared with some 300 in conventional carburetors has no choke (дроссель). It constantly adjusts the mixture of fuel and air, which cannot be done in usual carburetors. Provided with special mechanism the carburetor helps the engine turn on at once in cold weather. Though developed quite recently, it is already being used by cars and other kinds of public transport. With diesel engine becoming almost standard equipment, the vacuum carburetor will never be used on new cars. It may be said that present-day carburetors are dinosaurs and in 20 years there won't be any more. But there are some countries which are interested in importing the device as a replacement for existing carburetors.

CONVERSATION

Exercise 1. Answer the questions.

1. What are the main problems of public transport? (a new type of vehicle and its much more efficient use) 2. What type of modern vehicle may become a usual means of transport in the future? (a small electric car) 3. What is the possible development in private cars? (the use of an automatic guidance system) 4. What electronic

devices are used in modern cars? (a computer, fuel adjusting devices, an electronic instrument panel for indicating the speed, time, distance covered and fuel left) 5. What is the main function of a radar for a car? (detecting all possible dangers ahead of the vehicle on a road) 6. What unusual feature will a new generation car have? (four-wheel control system ensuring diagonal and side movements) 7. What materials are used in current automotive design? (ceramics)

Exercise 2. Make a sentence out of the two parts.

1. There are already some modern vehicles	1. goes out into the street, finds an empty car, gets into it, drives to his destination, gets out and leaves the car for the next passenger.
2. For example, a small electric car can solve	2. there may be no need to drive these cars.
3. A passenger	3. which may become a usual means of transport in the future.
4. With an automatic guidance system for cars,	4. increasingly wide use of modern microelectronics in cars.
5. It will be possible	5. many problems of public transport.
6. All these innovations will become possible because of	6. an important part in current car design.
7. Computers, electronic instrument panels, radars, adjusting devices, etc. are playing	7. to switch over to automatic driving, as we do in ships and aircrafts today.

Exercise 3. Read and learn.

Bob's New Used Car

John: This is the car that Bob bought from Mr. Adams.

Bill: I didn't even know that he had bought a car. When did he tell you that he had bought it?

J: He told me yesterday that he had bought it two days earlier.

B: Do you know how much he paid for the car?

J: Well, he said he had paid 800 dollars for it.

B.: I wonder why he bought an old car? I didn't think he needed a car.

J.: Well, I suppose he will use it for his new job.

- B.: Do you think the car is in good condition?
- J.: He told me that the car was in perfect condition. The tires are practically new. The new generator works perfectly. Frankly (откровенно говоря), I think that it was a good bargain (выгодная покупка, хорошая сделка).
- B.: I believe you are right.
- J.: I haven't mentioned that the car had been driven only 25,000 miles. Also, the covers (чехлы) which are on the front seats are new. They are made of material that can be washed.
- B.: Now I want to see how well the car really runs.
- J.: O.K. Let's ask Bob when he is going for a ride. Then we can see whether or not the car runs well.
- B.: Do you know if Bob is going to come back here soon?
- J.: Yes, I'm sure he'll be back right away (сразу, немедленно).
- B.: By the way (между прочим), can you tell me where Bob is keeping his car?
- J.: He is using the garage of the people living next door.

Exercise 4. Speak about:

1. Public transport of the future.
2. The application of electronics in modern cars.
3. The latest innovations in car design.

Use exercises 1,2 and the following words and word combinations for your topic: one thing is certain, to be much more efficient, to be in common use, to select a destination, to monitor, the size of a pack of cigarettes, to look like, to warn of objects ahead of the vehicle, to design, to get information, while driving, to make of.

Exercise 5. Comment on the following statement.

It is natural that everybody should want to have a car.

One point of view : It is convenient, saving time, avoiding crowded buses and other city transport, independent, comfortable, useful at weekends, contact with nature, developing the sense of responsibility, improving the level of technological culture.

A contrary point of view : Expensive, traffic jams (пробки в уличном движении), difficulties with repairs and maintenance, pollution, lack of physical exercise, takes more time than it saves, road accidents, waste of energy resources, the unbearable situation in many cities, especially in supercities.

Exercise 6. Read and smile.

On the Bus

It was during the rush-hour (часы пик). As usual, all the seats in the bus were occupied. When a good-looking young lady got in,

an elderly man sitting near the door wanted to rise, but the lady at once pressed him to keep his seat. «Thank you», she said, «I don't mind standing.» «But, madam, permit me ... ». «I insist upon your sitting down,» she stopped him, and putting her hands on his shoulders she almost forced him back into his seat.

The man tried again to stand up and said, «Madam, will you allow me to ... » But once more the lady said, «I don't wish to take your seat, sir!» and forced him back with another push.

With a great effort the man finally pushed her aside. «Madam», he called out, «I don't care whether you take my seat or not. The bus has already taken me two stops beyond my destination, and now I wish to get out.»

A good-looking lady-motorist was speeding through the sleepy village when a policeman stepped out on the road in front of her and forced her to stop. «What have I done?» she asked. «You were travelling forty miles an hour», replied the policeman. «Forty miles an hour!» cried the lady-motorist in surprise, «I left my house only 20 minutes ago».

Text 7B

Прочитайте текст и заполните следующую таблицу:

Car design innovations since 1770	The latest car electronic systems	Their advantages	Their disadvantages
1.			
2.			
⋮			

Используя таблицу, расскажите по-английски о наиболее важных усовершенствованиях в конструкции автомобиля с момента его изобретения. О каких последних достижениях в области конструирования автомобилей вы знаете? Какая информация в тексте наиболее интересна с вашей точки зрения и почему?

Car of Future

Ever since Nicolas Cugnot, a Frenchman, invented the first self-propelled road vehicle in 1770, there has been no shortage of companies willing to make a better automobile. Over years their efforts have given users the gasoline engine (дизель), the electric starter, tubeless tires (бескамерная шина), fuel-injected engines and anti-lock brakes (тормоз с антиблокировочным устрой-

ством), these are only a few innovations. What is next? Here are some examples of what the car designers are working at in the world today.

Engineers are experimenting with a state-of-art (новейший) system that enables drivers to see better after dark. This «night vision» system uses infrared sensors that can detect a human figure at night more than 1,600 feet away. That's five times the distance at which conventional headlights are effective. The sensors pick up infrared rays emitted by any object that gives off heat. An image-processing system scans the information from the sensors, creating different images for different objects. The images are then displayed on a cathode-ray screen built in a car's instrument panel. It is like black-and-white photograph of an object ahead. And the system is passive, which means no lights are needed to illuminate the object in front of the vehicle. But the biggest problem will be reducing costs and the other one is the size of the sensor mechanism which is too big now.

One of the latest applications of sophisticated electronics is the wheel-computerized system that not only monitors air pressure in automobile tires but adjusts it automatically. In addition this system enables a driver to set tire pressure while seated. The system developed consists of three separate modules. The first is the instrument panel display which houses the system's main microprocessor, programming buttons (кнопка включения программы) and warning signals. The second component is the detector drive module (модуль привода) which is essentially four microchips attached, in one unit, to the chassis. Each chip detecting pressure changes that may occur, the transistors within the module signal the third component — a programmable transducer (программируемый преобразователь). The transducer attached to each wheel changes the tire pressure accordingly.

However, some automobile experts think this system is too complicated and costly. The design has to be simple and of low cost.

Text 7C

Прочитайте и перескажите текст.

Talking Instrument Panels

For a few years now some of the most advanced new automobiles have been equipped with instrument panels that can «speak»

providing instrument readings or safety warnings from special electronic circuits.

In a polite female voice, the device will report on engine oil pressure, parking-brake and headlight operation, seat belt connection, totalling 14 different functions. The driver can even program the Voice Warning System to announce the time or to give a low-fuel warning for any preset gas tank level. The heart of the Voice Warning System is a microprocessor-based electronic speech module made by National Semiconductor Corp. (US). The device requires the connection of 18 wires, but it is simple enough to install in a car.

Text 7D

Прочитайте текст. Используя слова и выражения из текста, опишите свое состояние перед экзаменом.

Testing Times

Exam stress doesn't occur most strongly during the actual exams but in the few weeks just before them. The climax is usually the night before when last minute preparations confirm your worst fears (страх). There are, however, some simple ways of dealing with the problem.

First, one must know that the night before is too late to do anything. Much better to go to a dance, for a walk, to the pictures or to play a game rather than increase stress by frantic efforts to plug in gaps (затыкать пробелы) in your knowledge.

The brain is a complex bio-electrical machine which, like a computer, can be overloaded. It does not work continuously. When you study, your brain reaches its maximum efficiency about five minutes you start work, stays at it for about ten minutes and then it is down. Indeed, after thirty minutes your attention wanders (отвлекаться), your memory shuts off, and boredom (скука) sets in.

For this reason, the best way to study is in half-hour sessions with gaps in between of about the same length. It even helps to change subjects and not keep at the same one since it reduces the boredom factor.

Study stress was experienced by Isaac Newton, the greatest mathematical genius, and by Einstein. Newton had a depression after his efforts on gravity.

Einstein had no such difficulty: he would break off and go sailing or play violin — not very well, he said, but it was very comforting.

The lesson here is clear. To avoid exam stress, you have to tell that what you are doing is fun (забава) and the best way to do this is to treat revision as a game. If you stimulate your brain with short, snappy (энергичный) sessions, you will be surprised how quick and sharp you are. A laugh with friends or a walk through the country is really giving your mind the recreation it needs.

ДОПОЛНИТЕЛЬНЫЕ ЗАДАНИЯ

Упражнение 1. А. Прочитайте следующие слова и словосочетания из текста 7А и постарайтесь понять значения выделенных слов.

1. for long **journeys** in cars
2. **arriving** at the **motorway**
3. the fuel left in the **tank**
4. the radar **aerial**
5. the radar only **observes** objects **ahead of**
6. **stationary** objects
7. the red light and **buzzer** warn
8. satellite will indicate the **route**

В. Подберите к выделенному в А слову или словосочетанию соответствующее ему по значению.

- a. container for liquid or gas
- b. electrical device that produces a sound signal
- c. way taken or planned from one place to another
- d. see, watch carefully objects in front of
- e. not moving or changing
- f. reach a wide road for continuously moving fast vehicles
- g. travel to a distant place
- h. antenna

Упражнение 2. А. Прочитайте текст и найдите слова и словосочетания, означающие:

a new idea or product, reduce, basis, joining, position, for each car, whole (complete), very great, large number (quantity), at a very high level (suddenly), put together or fit the parts of, take (send to), every year, the same, a person who takes part in a race for the first place.

Mass Production

Car manufacturer Henry Ford laid the foundation for the revolutionary change in the entire motor vehicle industry.

The key for mass production was not the moving assembly line. It was the complete interchangeability of parts and the simplicity of attaching them to each other. These were the innovations that made the assembly line possible. Taken together, they gave Ford tremendous advantage over his competitors.

Ford's first efforts to assemble his cars, beginning in 1903, were to set up assembly stands on which a whole car was built. Each assembler performed many jobs on one car and had to get the necessary parts for it.

The first step Ford took to make this process more efficient was to deliver the parts to each work station. Now each assembler remained in the same place all day. Later in 1908 Ford decided that each assembler would perform only one task and move around the factory from car to car. In 1913 cars were placed on a moving assembly line. Each assembler performed one task only and remained stationary. This innovation cut cycle time from 2.3 minutes to 1.19 minutes, thus dramatically improving productivity.

Ford's discovery simultaneously reduced the amount of human effort needed to assemble an automobile. What is more, the more vehicles Ford produced, the more the cost per vehicle fell. In the early 1920s Ford produced 2 million identical vehicles a year.

Ford's mass production was adopted in almost every industrial activity in America and Europe.

В. Заполните пропуски, образуя составные слова, общеизвестные словосочетания или термины:

... time
vehicle ...
assembly ...
... effort

the cost ...
... production
... manufacturer
... industry

Упражнение 3. Прочитайте текст и постарайтесь понять значения выделенных слов.

There was a bad **accident** on one of the main **motorways** to Paris this afternoon. A big tourist coach **broke down** on the **inside lane** of the motorway, and the driver could not move it. It was about 5.30 in the afternoon, the middle of the **rush hour**, so it soon created a terrible **traffic jam**. A driver in a BMW doing about 60 mph tried to go round the coach. Unfortunately, another car was **coming in the opposite direction**. The driver **braked hard** and tried to stop, but he could not **avoid** the accident. The BMW

crashed into the front of his car. The driver of the BMW died, the other driver was **badly injured**, and both cars were **badly damaged**.

Упражнение 4. Выберите из двух выделенных слов или словосочетаний правильное.

1. While turning a corner at high speed my car **hit/crashed** a lamp post.

2. The only means of **arrival/access** to the station is through a dark subway.

3. We managed to complete our journey ahead **of/in** front of schedule.

4. The police accused the driver of breaking the speed **limit/restriction**.

5. Sixty extra policemen were to **direct/control** the traffic outside the stadium.

6. When her car broke down, she had to **catch/take** a taxi.

7. There are road works in center streets and long **delays/intervals** are expected.

8. This car is an automatic, so you do not have to **adjust/change** gear all the time.

9. Only a mechanic could **realize/understand** the true **amount/extent** of the damage to the car.

10. Travellers who wish to visit the old city should travel in the two front **buses/coaches**.

11. The driver told his passengers to **fasten/fix** their safety belts.

12. You mustn't **ride/drive** a motorbike without a helmet.

13. The two buses collided (столкнуться), but luckily none was **injured/wounded**.

Упражнение 5. А. Прочитайте текст и постарайтесь понять значения слов *tube*, *poor* и *run*.

Many of the world's major cities were built long before the car appeared and people realized the need to built efficient road systems. Current traffic management problems may be connected with old city planning.

The thing that saves some of these cities is an effective public transport system, usually below ground. London has an old but effective underground train system known as a **tube**, and a comprehensive bus and train system above the ground. Hong Kong has cheap, swift and effective public transport in the form of Mass Transit Railway, buses and ferries.

But there are newly built cities, such as, for example, Dallas, Baltimore and Los Angeles in America. Dallas is a wealthy city in Texas, which has grown up in an era when cars were considered to be essential to move about. It has an excellent road system, as does Baltimore, another new city with wise city leaders who insisted on building good roads. However, the public transport system in both Baltimore and Dallas is extremely **poor**. As a result, travel in these cities is easy except for peak hour, when a twenty minute **run** can take more than an hour in traffic jams. Los Angeles suffers from chronic highway blockages, despite efforts to encourage people to use public transport.

Cities with good road systems can use other methods to reduce the number of vehicles travelling together at peak hour. Flexible time is one good method: offices open and close at different times so people are travelling to and from work at different times. Vehicles carrying more than one person can use special priority lanes, which means they can travel more quickly. There are even systems to make peak hours car use more expensive, with electronic chips recording the presence of a vehicle in a given high traffic area at a given time.

B. Выберите соответствующие тексту А значения слов *ferries*, *poor*.

spacecrafts, airplanes, boats, space vehicles;
needing help, small in quantity, low in quality.

C. Найдите в тексте А слова, означающие:

1. demand	5. easily changed for new needs or conditions
2. rich	6. full, including many kinds of
3. journey in a car	7. having experience, knowledge
4. fast	8. main public road

D. Вставьте антонимы выделенных слов.

1. Public transport in Hong Kong is **cheap**, but in London it is ...

2. Paris has the Metro railway **below ground** and a large bus system ...

3. People should ... and **finish** work at different time to reduce peak hour traffic jams.

4. City administration try to encourage people to use ... transport, not **private** cars in the city center.

5. An electronic device can record the **absence** or ... of any person at the office.

6. The public transport available in Baltimore is very **poor**, while in Sidney it is ...

Е. Найдите в тексте А независимый причастный оборот. Переведите.

Упражнение 6. Заполните пропуски следующими словами:

reduce	transportation	advantage	car	per	traffic	public transport
source	study	average	routes	increase	symbol	atmosphere
number	motor vehicle	reduction	solve			

The private (1) ... has dramatically improved the comfort, speed and individual freedom of movement. The automobile has become a status (2) ... The car brought people much closer to places of work, (3) ... and entertainment.

However, the use of private cars can also be a (4) ... of many most serious problems today. The car is a disadvantage as well as an (5) ... It pollutes the (6) ..., may be involved in dangerous accidents, and by its very numbers blocks roads and chokes (душить) cities. In New York City, 2.5 million cars move in and out of the city each day. In this (7) ..., the average speed is sometimes 8.1 miles (8) ... hour. This speed could easily be reached by riding a horse instead of driving a (9) ... But New Yorkers continue to drive, just as people in London where the (10) ... speed in certain particularly overcrowded (11) ... is only 2 miles per hour. Most people believe that the car is a necessary part of life in today's world. Car owners usually do not consider other methods of public (12) ... such as bus, train or bicycle.

The only way to (13) ... these problems is to reduce the use of private cars. How can we do it? We may (14) ... access to parking spaces in the cities and simultaneously (15) ... the quality and availability of public transport. Cars could not be permitted in certain parts of the city, thus making people walk and use (16) ... The cost of buying and running a car can be increased with a corresponding (17) ... in the price of public transport. The reduced (18) ... of cars on the roads means less pollution.

Упражнение 7. Назовите прилагательные с окончанием *-able/-ible*, означающие:

that can be moved
that can be reached
that can be managed
that can be solved

that can be used or obtained
that can provide comfort
that may be permitted
that can be changed for new needs

Упражнение 8. Заполните таблицу на словообразование.

Verb	Noun	Person	Adjective
compete	...	...	...
...	action	...	...
...	...	transporter	...
...	...	...	productive
assemble	...	...	—
...	manufacture	...	—
found	...	...	—
...	drive	...	—
...	...	—	reducible
...	...	...	indicative

Упражнение 9. А. Назовите 15–20 ключевых слов и словосочетаний на тему «Road transport».

В. Speak about:

1. The current public transport problems in your city or town, its safety, speed and comfort.
2. The role and importance of a private car in your own life.
3. The changes in technology (manual assembly — mass assembly lines — robotics — computerized production).
4. Offer your own ideas on traffic management improvement in your area.

LESSON 8

Герундий

Значения *as* и *by*

Суффикс *-ize (-ise)*

Префикс *over-*

Text 8A. *A New Era for Aircraft*

Text 8B. *The Return of the Dirigibles*

Text 8C. *Off the Ground: How do We Find Where We are Going?*

Text 8D. *New York*

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

Упражнение 1. Найдите в предложениях герундий по его признакам, переведите.

1. On detecting danger on the road the computer signals the driver. 2. Detecting an object in front of a car in the dark is the purpose of the «night vision system». 3. One of the main problems of a driver on the road is keeping the speed constant and watching the cars ahead. 4. A new device for monitoring and adjusting air pressure in tires has recently been developed. 5. Before starting a car one must examine it carefully. 6. Computers are widely used for controlling all kinds of processes. 7. Alexander Bell's being a teacher of deaf people influenced his interest in sound and its transmission. 8. Samuel Morse's hobby was experimenting with electricity. 9. Driving a truck in the city is difficult.

Упражнение 2. Определите формы и функции герундия.

1. One of the best ways of keeping the speed steady is using a computer for this purpose. 2. Newton's having made a mistake in his calculations has no influence on his theory. 3. On being turned

on the radar will warn the driver of stationary or slow-moving objects on the road. 4. Upon being heated the molecules begin moving very rapidly. 5. The white line in the centre of the road is one of the most effective means of controlling traffic. 6. On graduating from the University S.P. Korolev began working in the field of rocket design. 7. The function of a car computer is detecting and summing up the information about the road conditions. 8. Monitoring and adjusting air pressure in tires is one of the new developments of the car designers. 9. It is difficult to solve some of the present-day scientific and technological problems without using supercomputers. 10. On seeing a red light on a panel and on hearing a warning sound the driver should decrease the speed. 11. By picking up infrared rays emitted by objects ahead of the car an image-processing system produces different images of objects. 12. On studying for half an hour before an exam one should switch over to some other activity.

Упражнение 3. Переведите предложения и запомните значения выделенных слов.

A. 1. When the first self-propelled vehicles appeared, **measures** were taken to limit their speed in many countries. 2. His having **measured** the distance will enable him to calculate the intensity of light. 3. The universal system of **measures** and weights was worked out by the French Academy of Science in 1791. 4. The distance from the North Pole to the Equator was **measured**, one-fourth was taken and divided into ten million equal parts. One of these parts was called a «**measure**» or «a meter».

B. 1. One of the earliest ideas to propel a vehicle **using** mechanical power was suggested by Isaac Newton. 2. Having **used** a steam-driven engine a French engineer built a three-wheeled vehicle for two passengers. 3. At the end of the 19th century the **use** of cars was still very limited. 4. Constant efforts are made to **use** standard components for the cars. 5. The **use** of multi-cylinder engines greatly increased the speed of cars. 6. N. Otto having **used** the gasoline engine, motor cars got the standard shape and appearance.

C. 1. Many **times** Alexander Bell wanted to stop his experiments being unable to get any results. 2. Since ancient **times** people dreamt of flying. 3. Four **times** five is equal to twenty. 4. There is much more lithium on the earth than zinc, 130 **times** more than cadmium. 5. The magnesium-lithium alloy is 1.5 **times** lighter than aluminium and 4.5 **times** lighter than iron.

Упражнение 4. Переведите предложения и запомните различные значения *as*.

1. People no longer think of the radio and television as something fantastic. 2. It was necessary to lay cables across the Atlantic Ocean as there was no radio or satellites at that time. 3. Rocket launching, concerts, football and tennis matches can be seen on TV as they occur. 4. As the operation of integrated circuits depends on microscopic components, the purity of all materials at the plant must be very high. 5. One can see that there is no principal difference between iron and copper as conductors. 6. President T. Jefferson offered his personal library as the basis for the national library. 7. It is difficult for the first-year students to study at the institute as they do not know yet how to organize their work and time. 8. No system of the past was as simple as the metric system. 9. Such metals as iron, cobalt, and nickel are much more magnetic than any other known substances. 10. Cryogenic fuels such as liquid hydrogen are used to cool the aircraft surface. 11. Metallurgists are trying to make composite materials as strong and light as possible. 12. Measures must be taken to keep Moscow air as clean as possible. 13. Engineers are working at the problem of making computers as small as possible.

Упражнение 5. Переведите предложения, учитывая различные значения предлога *by*.

1. It should be said that according to estimates the production of materials in space is to bring 60 billion dollars by 2030. 2. The best way to study before the exam is by changing one's activity every 30 minutes. 3. The first self-propelled vehicle in Russia was made by Kulibin in the 18-th century. 4. Driving a new Japanese car a driver will find his way even in Sahara by switching over to a navigation Earth satellite. 5. By 1960 the number of cars in the world has reached 60 million. 6. A driver may avoid collisions on the road by using a radar system. 7. Newton's great work «Principia» was published by Halley, the famous astronomer, who paid his own money for it. 8. The cosmonauts were told to increase their daily exercises by 30 minutes.

Упражнение 6. А. Найдите русские эквиваленты для словосочетаний.

a new form of supersonic transport, prospective model, elongated fuselage, without horizontal stabilizer, cover the distance, less than two hours, overall length, overall aircraft weight, at high velocities, lower atmosphere, the skin is heated, the only way out,

one of the ways, combined engines, combined with, as economical as possible.

единственный выход, комбинированные двигатели, менее двух часов, без горизонтального стабилизатора, нижние слои атмосферы, один из путей, удлиненный фюзеляж, общий вес самолета, обшивка нагревается, на больших скоростях, общая длина, как можно более экономично, перспективная модель, новый вид сверхзвукового транспорта, в сочетании с, покрывать расстояние.

В. Переведите словосочетания.

today's aircraft, ordinary aircraft, ordinary aircraft windows, passenger liner, future superliners of such a class, reliable hypersonic plane, look like a rocket, five times above the speed of sound, diameter of the fuselage, the front of the cabin, the skin is heated to a very high temperature, highly economical engines, new generation model.

СЛОВООБРАЗОВАНИЕ

Упражнение 7. Образуйте и переведите производные слова согласно образцу:

прилагательное или существительное + ize/ise = глагол
special — специальный → specialize — специализировать(ся)
computer, ideal, crystal, central;

префикс over- (сверх-; пере-)
to heat — нагревать → to overheat — перегревать
production, active, grow, estimate.

Упражнение 8. Прочитайте и переведите интернациональные слова.

aviation, airplane, project, passenger, liner, model ['mɒdl], fuselage ['fju:zɪlə:ʒ], horizontal stabilizer ['steɪbɪlaɪzə], rocket, distance, meter ['mi:tə], diameter [daɪ'æmɪtə], cabin, technological, problem, thermodynamics ['θə:məʊdaɪ'næmɪks], aerodynamics ['æərəʊdaɪ'næmɪks], per cent, efficiency [ɪ'fɪʃənsɪ], extreme [ɪks'tri:m], temperature ['temprɪʃə], cryogenic ['kraɪədʒenɪk].

Упражнение 9. Прочитайте и запомните произношение слов.

supersonic ['sju:pə'sɒnɪk], hypersonic ['haɪpə'sɒnɪk], Paris ['pærɪs], Tokyo ['təʊkjəʊ], plane [pleɪn], hours ['aʊəz], reliable [rɪ'laɪəbl], combined [kəm'baɪnd], engine ['endʒɪn], heat-insulat-

ing [hi:t 'insjuleɪtɪŋ], extreme [ɪks'tri:m], generate ['dʒenəreɪt], generation, in general, require [rɪ'kwaɪə], fuel [fjuəl], liquid ['lɪkwɪd], hydrogen ['haɪdrɪdʒən], surface ['sə:fɪs], vaporize ['veɪpəraɪz], inject [ɪn'dʒekt], combustion [kəm'blʌstʃən], chamber ['tʃeɪmbə], percentage [pə'sentɪdʒ].

СЛОВА И СЛОВСОЧЕТАНИЯ ДЛЯ ЗАПОМИНАНИЯ

amount *n* — количество
announce *v* — объявлять, заявлять
combine *v* — сочетать(ся), комбинировать(ся), объединять(ся)
combined with — в сочетании с
combustion *n* — горение
complicated *p.p.* — сложный
conventional *a* — обычный, стандартный
currently *adv* — в настоящее время
disadvantage *n* — недостаток
measure *n* — мера
noise *n* — шум
overall *a* — полный, общий
overcome *v* — преодолевать
resistance *n* — сопротивление
stress *n* — напряжение

efficiency *n* — производительность, КПД, эффективность
e.g. (for example) — например
expect *v* — ожидать, предполагать
extreme *a* — крайний, чрезвычайный
friction *n* — трение
fuel *n* — топливо
heat *v* — нагревать(ся)
inject *v* — впрыскивать, вводить
mainly *adv* — главным образом
structure *n* — конструкция, структура
substitute *v* — заменять, подставлять
vaporize *v* — испарять(ся)
velocity *n* — скорость

apart from — помимо, кроме

way out — выход

Text 8A

Прочитайте текст по абзацам и озаглавьте их. Назовите основные проблемы, рассмотренные в каждом абзаце. Скажите, какие абзацы можно объединить под одним заглавием. Переведите текст.

A New Era for Aircraft

Aviation experts expect that today's aircraft will begin to be replaced with some new form of supersonic transport in a few years' time. A 21st century hypersonic aircraft may open a new age of aircraft design.

The designers of this country displayed the project of such a supersonic passenger liner among the prospective models at one of the latest Aerospace Salon held on the old Le Bourget airfield¹ in Paris. An elongated fuselage with a sharp nose and without a horizontal stabilizer makes it look more like a rocket. The speed matches the looks². This plane will fly at a speed five to six times above the speed of sound, e.g., it will cover the distance between Tokyo and Moscow in less than two hours. The diameter of the fuselage will be 4 meters and the overall length 100 meters, with the cabin accommodating 300 passengers. The future superplanes of such a class will have no windows, but the passengers can enjoy³ watching the panorama of the Earth on the TV monitor at the front of the cabin. They will fly so fast that ordinary aircraft windows would make the structure too weak to withstand the stresses at such a speed. At high velocities the air resistance in the lower atmosphere is so great that the skin is heated to very high temperature. The only way out is to fly higher. Therefore, airliners' routes will mainly lie in the stratosphere.

In general, to build a reliable hypersonic plane one has to overcome a whole set of technological and scientific difficulties. Apart from creating highly economical combined engines and heat-insulating materials⁴, designers have to make such an amount of thermodynamic computations that can't be performed without using supercomputers. One of the ways to make planes as economical as possible is lightening the aircraft by substituting new composite materials for conventional metal alloys. Accounting for⁵ less than 5 per cent of the overall aircraft weight now, the percentage of composite material parts will exceed 25 per cent in new generation models. An extensive use of new materials combined with better aerodynamics and engines will allow increasing fuel efficiency by one-third⁶.

Because of the extreme temperatures generated by the atmosphere friction, a hypersonic craft will also require complicated cooling measures. One possibility is using cryogenic fuels, such as liquid hydrogen, as both coolants⁷ and propellants. The fuel flowing through the aircraft's skin would cool the surfaces as it vaporizes before being injected into combustion chamber.

In addition, specialists in many countries are currently working on new propeller engines considered much more economical and less noisy than jets. The only disadvantage is that propeller planes fly slower than jet planes. However, it has recently been announced that specialists succeeded in⁸ solving this problem. As a result a ventilator engine with a propeller of ten fibre-glass blades has been built, each being five meters long. It will be mounted in the experimental passenger plane.

Notes to the Text

1. Le Bourget airfield — аэропорт Ле Бурже
2. the looks — внешний вид
3. can enjoy — с удовольствием (*здесь*)
4. heat-insulating materials — теплоизолирующие материалы
5. accounting for — составляя
6. by one-third — на одну треть
7. coolant — охлаждающая жидкость
8. succeeded in — удалось

УПРАЖНЕНИЯ

Упражнение 10. Просмотрите текст 8А и ответьте на вопросы.

1. What is this text about? 2. What aircraft was displayed in Paris? 3. What are the characteristics of the new liner? 4. What are the difficulties in building a hypersonic plane?

Упражнение 11. Укажите, какие утверждения соответствуют содержанию текста 8А. Исправьте неправильные утверждения.

1. Today's aircraft will be replaced with a new form of supersonic transport in a few years' time. 2. The new hypersonic aircraft that looks like a rocket will cover the distance between Tokyo and Moscow in less than two hours. 3. The future superliner of this class will have large windows that will allow passengers to watch the panorama of the Earth. 4. Airliner's routes will mainly lie in the stratosphere because the air resistance in the lower atmosphere is too great. 5. Designers can easily make all the necessary thermodynamic calculations to build a reliable hypersonic plane. 6. It is possible to lighten the aircraft by substituting conventional metal alloys for new composite materials. 7. Cryogenic fuels are used as both coolants and propellants. 8. The great advantage of propeller planes is that they fly faster than jet planes.

Упражнение 12. Найдите в тексте 8А герундий (см. 3, 4 и 5-й абзацы).

Упражнение 13. Найдите герундий в функции обстоятельства, переведите предложения.

1. Flying from Los Angeles to Tokyo on board a new supersonic craft will take two hours. 2. On examining the car before starting on a long journey a driver can be sure that he will get to his destination without accidents. 3. By summing up the information about the speed and distance of various objects on the road, the computer de-

fects all possible dangers. 4. A superliner of a new kind will be capable of flying at five times above the speed of the sound. 5. The only way of overcoming the great air resistance at high velocities is flying higher. 6. At low speeds the engine can use turbines for compressing the air before mixing it with fuel in the combustion chamber. 7. In the future, in switching over to the new Earth satellite a driver can be sure of coming safely to his destination. 8. Cryogenic fuels will vaporize before being injected into combustion chamber. 9. In flowing over the aircraft's surface the fuel cools its skin. 10. On reaching its cruising speed the supersonic liner will fly at 100,000 feet above the Earth. 11. By using supercomputers it is possible to avoid making mistakes in extremely complicated thermodynamic computations. 12. A new carburetor offers easier starting in cold weather. 13. By using the automatic guidance system a driver will be able to make long journeys without concentrating on the road conditions. 14. It is impossible to solve economic problems without using the achievements of the scientific and technological progress.

Упражнение 14. Найдите герундий в парах предложений, переведите их.

1. Overcoming these difficulties is not so easy as it may seem. Overcoming these difficulties the designers can increase the fuel efficiency. 2. Setting a problem the scientist makes the first step to its solution. Setting a problem is the first step to its solution. 3. Covering the distance between Tokyo and Moscow in less than two hours this superliner develops a speed five times above the speed of sound. Covering the distance between Tokyo and Moscow on board a superliner requires about two hours. 4. Putting the discovery into practice the engineers will solve a complicated technological task. Putting the discovery into practice sometimes requires more effort than making it.

УПРАЖНЕНИЯ ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ

Упражнение 15. Образуйте прилагательные от глаголов или существительных по образцу:

move — двинуть, двигаться → movable — подвижный

comfort, change, compare, control, program, measure.

Упражнение 16. Определите, к какой части речи относятся слова.

reliable, elongate, percentage, stabilizer, stabilize, prospective, carrier, brilliant, relativity, intelligent, intelligence, assistance, fu-

selage, mainly, encircle, departure, statement, hypersonic, liner, horizontal, powerful.

Упражнение 17. Найдите русскому слову соответствующее английское.

конструктор — design, designer, to design

стабилизировать — stabilizer, stability, stabilize

самый последний — latest, late, later

эффективный — efficient, efficiency, efficiently

характеристика, работа — perform, performing, performance

надежно — reliable, reliability, reliably

немыслимый — thinking, thinkable, unthinkable

невесомость — weightlessness, weightless, weight

Упражнение 18. Определите, синонимами или антонимами являются приведенные пары слов.

advantage — disadvantage; to remain — to stay; reliable — unreliable; fast — slow; apart from — besides, in addition; capable — incapable; to begin — to start; liquid — solid; to cool — to heat; possible — impossible; weak — strong; to build — to break; aircraft — plane; engine — motor.

Упражнение 19. Переведите выделенные слова и словосочетания, запомните их.

1. At higher schools specialization **generally** begins in the third year. 2. Nowadays we **generally** have computers at every plant. 3. This doesn't improve the speed of transport vehicles **in general** and that of an automobile **in particular**. 4. The **general** principles of the design of new transport machines **in general** and diesel locomotives **in particular** can be found in the new magazine. 5. The fifth-**generation** computers performing 100 billion operations a second will become available in the near future. 6. Because of the extreme temperatures **generated** by atmospheric friction a craft will require protection. 7. The **generation** of electric power increases every year.

Упражнение 20. Определите, какой частью речи является в предложении выделенное слово. Переведите.

1. Television has a great number of **uses** nowadays. 2. This car **uses** a new sensor mechanism. 3. A. Bell wanted to build a mechanism that people could **use** to talk to one another over long distances. 4. The new material can be applied in manufacturing components much smaller than those **in use** today. 5. The Library of Congress serves not only Members of the Congress, but re-

searchers and scientists who **use** it. 6. In Russian universities there is no charge for the use of reading rooms, laboratories and libraries. 7. **Measures** to keep Moscow's air clean are important components of our ecological programme. 8. A thermometer is a device that **measures** temperature. 9. Computers can do many things, they can **control** machines in factories, cars on roads, play chess and so on. 10. Computers **control** nearly everything we do in the modern world. 11. Today dirigibles are equipped with electronic **controls**.

Упражнение 21. Выберите правильный глагол из приведенных в скобках.

1. The car has ... (brought, brought about) mobility to millions of people, but at the same time polluted the atmosphere. 2. The scientific and technological achievements ... (brought, brought about) great changes in people's life and work. 3. A lot of people came to ... (look at, look for) a new invention, the television set, at the World Fair in New York. 4. It was necessary ... (to look at, to look for) a more reliable method of calculation. 5. The airplane «Ruslan» can ... (carry, carry out) up to 150 tons. 6. Research is being ... (carried, carried out) for developing new composite materials to lighten aircraft structure.

Упражнение 22. Заполните пропуски предлогами *by, with, for, at, in*.

The steam was invented ... James Watt, who worked ... many years before he could make the instruments ... which he perfected his machine. ... first he worked ... primitive tools so he could not make his engine well-regulated. The old machine was kept going ... a boy who stood by it and let ... the air ... means of which the steam was condensed at every revolution. ... this machine, though it was imperfect, some work was done and it had been used ... a large mine-owner (шахтовладелец) to pump out the water. The first efficient steam-engine was made ... a Birmingham firm and it was soon used...nearly every manufacturer. The revolution in industry made ... this machine was extremely great.

Упражнение 23. Дайте недостающие формы глаголов, запомните их.

held, flown, overcome, withstanding, lain, flow, burnt.

Упражнение 24. Прочитайте и переведите без словаря.

«Even the birds aren't flying today» is an old saying used to indicate that the weather for flying is extremely bad. And for man nothing has a greater effect on flying than the weather. And because of its changing so quickly and without warning an extensive

network of weather stations has been set up for helping the pilots get all the information about weather. Before flying pilots may get current weather information on changing conditions along their route or at their destination. The weather reporting system helps overcoming many difficulties in flying. In winter, e.g., icing can cause the reduction of lift efficiency of airplane by changing the flow of air. Pilot's being informed about the weather allows him to avoid weather problems. The weather being too bad, pilots just stay on the ground like any wise (опытный) bird.

CONVERSATION

Exercise 1. Answer the questions.

1. What kind of aircraft may begin a new age in aviation? (a hypersonic passenger liner) 2. What is the shape of the new liner? (an elongated fuselage with a sharp nose) 3. What distance can the new liner cover in less than two hours? (the distance between Tokyo and Moscow) 4. What are the main problems of building a reliable hypersonic liner? (developing an economical engine and new heat insulating materials combined with better aerodynamics) 5. What is one of the ways to make a hypersonic liner as economical as possible? (using new composite materials) 6. What will be used for cooling a hypersonic craft? (cryogenic fuels) 7. What combined engine was developed? (a ventilator propeller engine)

Exercise 2. Make a sentence out of the two parts.

1. It is expected that a new hypersonic aircraft	1. will be 4 meters, overall length 100 meters and its cabin will carry 300 passengers.
2. The project of such an aircraft was displayed at	2. a speed five to six times above the speed of sound.
3. There is no horizontal stabilizer	3. like a rocket.
4. Therefore it looks more	4. since conventional aircraft windows are too weak to withstand high stresses at supersonic speed.
5. The superliner will mainly fly in the stratosphere at	5. the Aerospace Salon in Paris.
6. The diameter of the fuselage	6. will replace today's aircrafts soon.
7. The passenger superliners of such a class will have no windows	7. in the design of a new superliner.

Exercise 3. Read and learn.

Departure

Ann: Well, good-bye, then! I hope you will have a pleasant journey.
Bob: I hope so too. The weather isn't too bad, anyway.
A.: No, it looks good. Just write me a few lines when you arrive, will you?
B.: I will, indeed. And many thanks for your hospitality.
A.: It was nice having you with us. When will you come again?
B.: It is hard to say. It depends on a number of things.
A.: Give my love to your mother.
B.: I will. Thanks. Bye.

Bob: I think, the people of today are the most intelligent (умный) people who have ever lived.
Mary: Before answering this question I want you to listen to the following words: «Flying machines are possible. A man may sit in the middle of the machine and turn some device. This device makes the artificial wings beat the air in the manner of a flying bird.»
B.: Why have you said this? There is nothing new or interesting.
M.: But they were written six hundred years ago.
B.: Oh, really, who made this statement?
M.: Roger Bacon, an English scientist. Of course, his sentences have been made easier, but these were his words and thoughts. Have you heard about him?
B.: Certainly, I have heard about him. But I have thought he was a monk (монах) and was in prison for many years.
M.: You are quite right. Besides, he made a deep study of physics. And this was the reason (причина) for his being in prison. He made men think about new things.
B.: Oh, Mary, I've always said you are the most clever (умный) girl I've ever met. Do you agree with me, Peter?
Peter: Oh, sure. And I remember Bacon's statement about cars that can go very rapidly by their own power and great ships on rivers and oceans guided by one man.

Exercise 4. Speak about:

1. The characteristics of a new hypersonic passenger liner.
2. The main difficulties of its construction.

Use exercises 1, 2 and the following words and word combinations for your topic:

The text gives the information on... It is interesting to note that... Speaking about... Further description of ... is given. It is pointed out that... As far as I know... In conclusion I'd like to say that...

aviation designers, to display, to cover the distance, overall, to heat to a very high temperature, new generation aircraft, to overcome difficulties in, a great amount of, without using, extensive use of new materials, exceed, to solve a problem.

Exercise 5. Comment on the following statement.

Air transport has many advantages and many disadvantages.

One point of view : It is fast, comfortable, safe, it is particularly good and efficient for long distances, it is independent of roads, it is good for the health because it is not tiring (утомительно), it is the most modern means of transport and it is the best way of travelling.

A contrary point of view : It is not safe, it is not reliable, it depends on the weather, it is not always good for the health, it always takes a long time to get from and to the airport, it is expensive, it is always connected with nervous strain (напряжение, стресс)

Exercise 6. Read and smile.

A teacher was explaining fractions to the class of girls and boys. After having written several examples on the blackboard, he asked a boy whether he would prefer (предпочитать) one-fifth or one-eighth of a lemon.

«I'd prefer one-eighth, sir.»

Then the teacher began explaining again that though the fraction one-eighth looked larger than the fraction one-fifth, it was really the smaller of the two.

«I know that, sir. I don't like lemons.»

Einstein for a Day

Albert Einstein, one of the world's most brilliant and respected scientists, is best known for formulating the theory of relativity which played a critical part in the development of atomic energy. What may not be widely known is that Einstein had a fine sense of humor.

There is an amusing story about Einstein's visiting universities in a car driven by a chauffeur, giving lectures on relativity. One day the chauffeur said: «Mr. Einstein, I've heard you give this lecture about 30 times. I know it by heart, and I am sure I could give it myself.» «Well, I'll give you a chance», said Einstein. «They won't recognise me at the school. When we get there, I'll put on your cap and you introduce yourself as me and give the lecture.»

The chauffeur gave Einstein's lecture without making a single mistake. On finishing, he started to leave, but one of the professors stopped him to ask a complex question. The chauffeur thought fast.

«That problem is so trivial», he said, «I'm surprised that you have to ask me. In fact, to show you how simple it is, I'm going to ask my chauffeur to come up here and answer your question.»

Text 8B

Прочитайте текст. Ответьте на следующие вопросы:

Почему вернулись вновь к использованию дирижабля?

Чем отличаются современные дирижабли от первых конструкций?

Каково их практическое применение?

Какие сведения из текста вам знакомы?

Что нового вы узнали, прочитав этот текст?

The Return of the Dirigibles

When it comes to technology, people are not inclined to return to the past. Yet, some exceptions do exist. Such is the attitude at present towards dirigibles. Having abandoned the skies more than 40 years ago, they have suddenly begun to reappear. Designers have once again sat down to design this kind of transportation. Their use can still be limited, but there is no doubt that dirigibles are coming back.

Why is dirigible attractive? What do you do with it? As its cruising speed is about 60 miles per hour, it is too slow to be used as a passenger carrier. But it is cheaper to operate than a helicopter, comfortable and capable of flying for several days. The craft's large size and staying power (dirigibles have remained in skies for as long as a week) make it ideally suited for exploration.

Their use in countries that have large territories and are rich in forests and are planning to explore and exploit new regions is most promising. They may be used to make a geological survey and to make maps, to look for off-shore oil and minerals, to take tourists to roadless, but beautiful places, to deliver heavy loads to remote regions and bring the products back. They have a potential use as a flying platform. In general, their possibilities are endless. They do not need expensive runways required by cargo planes.

Besides, the technological possibilities of manufacturing these crafts have changed. In 1920 and 1930s the dirigibles were manned by a big crew. Today being equipped with electronic control they can be operated by three pilots.

The modern dirigibles have one more important advantage over older models — that of complete safety in flight, for, instead of hydrogen, they are filled with helium which does not burn. The craft is 200 feet long and is made of superstrong materials.

In the future it may be possible to build a dirigible with a metal hull that could carry hundreds of passengers and transport cargo around the world. In fact, it is probably as a cargo vehicle that the dirigible will have the best chance to find its use.

Text 8C

Прочитайте текст. Расскажите по-английски о трех способах навигации и применяемых для этого устройствах.

Off the Ground: How do We Find Where We are Going?

Scientists who are concerned with such a problem generally agree that birds have some kind of so-called «second sense» that allows them to fly over land and water without getting lost. Indeed, birds are always able to find their destinations and make a return fly without any trouble at all.

But people need help in finding their destination when piloting their own airplanes. This, of course, is called navigation.

Navigation is the art of finding your way from where you start to your destination. Whether used by the seamen, explorer or the pilot, navigation falls into three basic categories: dead reckoning (счисление пути) which is the basis for all navigation, celestial navigation which is flying by the aid of the sun and other stars, and radio and radar navigation.

Several different kinds of aeronautical maps provide all the details which might be needed by the pilot. And hundreds of radio navigation stations are located at different places around the world to help guide the pilot. All the pilot needs to do is to tune to these radio transmitters and he will get the directional signals he needs. Distance measuring equipment now used in many airplanes tells the pilot exactly how far he is from a radio station and at what speed he is travelling over the ground.

When certain types of weather prevent the pilot from seeing the ground, additional radio transmitters let him make his approach to an airport by simply watching his flight instruments and his radio receiver indicators. These receivers help the pilot descend on the runway, thus landing at an airport even though he cannot see the ground.

At the world's larger air terminals airplanes are provided with radar guidance as another means of guiding the pilot to the destination. With the help of an electronic transponder (ретранслятор) in each airplane which shows it on the radar screen, radar controllers guide hundreds of airplanes to landing.

Because of the great improvement in electronic and radio navigation equipment, flying to where you are going is done as efficiently as the birds do it and much more scientifically.

Text 8D

Прочитайте текст. Расскажите по-английски о Нью-Йорке, культурном, финансовом и промышленном центре США.

New York

Situated at the mouth of the deep Hudson River, New York has always been the gate of the USA. But it is more than just a door: it is also a window through which the life of the whole nation may be observed. New York is a city of striking social contrasts. It is a place where most of the millionaires live and at the same time a greater proportion of New Yorkers live at a lower level than the average for the US. In 1626 Dutch colonists set up here the first settlement, named New Amsterdam. They bought Manhattan Island from Indians for 24 dollars and a barrel of rum. The Americans say that it was the best business deal ever made in New York. In 1664 the colony was captured by British fleet under Duke of York and renamed New York.

Now New York includes five boroughs: Manhattan, the Bronx, Queens, Brooklyn and Richmond.

Manhattan is the smallest of the five city boroughs in size and it is not the largest in population although the majority spend a considerable part of the day in this center of business life. Here are Broadway, Wall Street and the Stock Exchange. This is the heart and source of American policy.

Harlem is also in Manhattan. Thick walls separate this «Black Bottom» with 450,000 coloured people from the white population.

In the bay stands the bronze Statue of Liberty given to the United States by France as a present in 1886. Its torch is 60 meters high and can be seen at night for many miles. A new American Museum of Immigration is open at the base of the Statue.

The Bronx is a more residential rather than industrial part of the city. The well-known Zoo and Botanic Gardens are in the Bronx.

Queens is both a residential and industrial area. New York's two biggest airports are both there.

The Brooklyn Navy Yard is the largest naval shipbuilding center in the world. Brooklyn has more people than any other part of the city — about 3,000,000. It is mostly a district of middle-class people.

Richmond is the borough of piers and warehouses. Its population is only 200,000.

What makes New York? First of all, it is a great seaport, the greatest in the USA. The sea encircles many of the city areas. It is also a great financial center, where «money-making» is the main law of life. It is the symbol of big business and its Wall Street has become a nickname for big monopolies all over the world. New York is the leading textile center of the country and its clothes industry. It has a considerable printing industry and many book-shops. It is also undoubtedly one of the centres of social and spiritual life of America. There are a lot of Art Galleries, among them rich Henry Frick collections, and many impressive art museums (Metropolitan Museum, Modern Art Museum, American Art Museum and others). For a long time New York specialized in giving visitors a good time at its theatres, restaurants, night clubs, sporting arenas, and therefore has a large hotel industry. It is the main publishing, advertising and radio center with Columbia and New York universities and various city colleges.

Among the inhabitants of New York one can meet people of almost all nations. The population of New York numbers about 16 million. The citizens speak seventy-five different languages.

ДОПОЛНИТЕЛЬНЫЕ ЗАДАНИЯ

Упражнение 1. Прочитайте текст, найдите герундий и причастие настоящего времени, переведите.

In most capital cities built long before the time of the private car there is rarely enough space for moving traffic, and certainly not enough for parking vehicles. Buses move slowly because of the great volume of traffic, thus encouraging more people to give up (отказаться) using public transport. Banning traffic from some areas may help, but such a solution may not actually make less the number of cars coming into the city. The new city cannot survive (выжить) without building a series of ring roads. During the working hours of the day, there is the constant noise of traffic, but at night the center is almost empty.

The most environmentally-friendly way of solving traffic problems is to use more widely public transportation. Buses require fewer parking lots, make less noise and use less road space per passenger than private cars. They consume less fuel, causing less air pollution.

Some environmentalists dream of turning parking lots into parks and replacing cars with bicycles. In some countries there are extensive networks of bicycle paths, which make cycling a safe and enjoyable form of transportation.

Упражнение 2. А. Прочитайте словосочетания и выберите для выделенных слов соответствующие тексту 8А значения.

1. with the cabin **accommodating**
 - a. grant
 - b. have, provide a room or place for
 - c. change
2. the **skin** is heated
 - a. outer covering of human body
 - b. outer covering of a fruit
 - c. outer layer or surface
3. **lightening** the aircraft
 - a. make light or bright
 - b. reduce the weight of
 - c. make visible
4. the fuel **flowing** through
 - a. move along or over
 - b. come from
 - c. be the result of
5. fibre-glass **blades**
 - a. cutting part of a knife
 - b. a part of a tool for playing baseball
 - c. flat wide part of a propeller

В. Найдите в тексте 8А слово с тем же значением, что и *fuel* (см. 4-й абзац).

Упражнение 3. А. Прочитайте текст и постарайтесь понять значения выделенных слов.

Virtual Laboratory **Expands** NASA Research

NASA has successfully concluded tests on a computer-generated virtual laboratory that will allow researchers, located anywhere in the world, to study potentially dangerous aircraft and spacecraft situations without risking human life.

The lab can enable research organizations to **collaborate** long-distance without having to be physically present at the world's largest flight simulator at Ames Research Center, California. It could also be used by universities, research laboratories and industry to develop a wide variety of products beyond the aerospace field. Fu-

ture uses of the laboratory being considered include designing new spacecrafts and training astronauts.

The simulator is able to move airplane and spaceship **cockpits** in all directions, including 60 feet vertically and 40 feet horizontally. There are five interchangeable **cockpits** that are used to simulate the Space Shuttle, helicopters, airplanes and other aerospace vehicles.

The simulator creates a convincing environment for a pilot and is controlled by computers programmed to represent each aircraft proposed.

Computers calculate correct aircraft **response** when a pilot changes simulator cockpit controls. In real time, responses by the simulator include cockpit motion, images in the windshield, sounds and control readouts. Simulations are monitored from the control lab at ARC. The virtual laboratory and the «world» it creates exist partly in computer memory and other physical **gear**.

Recently, astronauts made simulated Space Shuttle landings using a huge motion simulator at ARC while NASA engineers in Houston monitored the sessions using the three-dimensional «world» that includes video screens, computer video, two-way video conferencing, remote data access and a pilot’s out-the-window **scene**.

В. Выберите для выделенных в тексте А слов правильные значения.

a. reaction	d. work in partnership
b. view	e. compartment for the pilot
c. make larger	f. apparatus, mechanism

С. Замените в предложении выделенный глагол другим глаголом с тем же значением.

1. A new system **enables** researchers to carry out complicated tests.
2. Engineers **have completed** their research in the aerospace field.
3. A huge simulator **provides** the condition of real operations in flight.
4. Virtual lab helps us **learn** how to better use cockpit controls.
5. A pilot **can** move aeroplane in all directions.

Д. Заполните пропуски, образуя составные слова, общеизвестные словосочетания и термины. Запомните их.

remote ...	space
long ...	aerospace

... shuttle
 air ...
 ... memory
 out-the-window ...
 ... world
 research ...

... screen
 ... conference
 human ...
 ... access
 wind ...
 ... time

Е. Заполните таблицу на словообразование.

Verb	Noun	Person	Adjective
... direct	organization ...		
...	...	collaborator	—
...	...	...	local
... represent	simulation ...		— ...

Ф. Образуйте от выделенных слов существительное, прилагательное или наречие и заполните пропуски.

physics

1. It is ... impossible to be in two places at once.
2. ... is an expert dealing with matter and energy.
3. Mechanical laws and Newtonian ... are very important for creating virtual systems.
4. The equivalent of clip art for virtual reality designers might be ... systems.

possibility

5. What will make the virtual reality design system of tomorrow ...?
6. Is there any ... of your taking part in virtual reality conference this year?
7. If we throw an object, it flies across the room, ... hitting another object and causing a complex chain of events as objects crash into each other.

success

8. Virtual reality can have great ... in many ways, especially in experimenting.
9. Recent ... tests of the world's largest simulator enable scientists to do research in education, management and industry.
10. Astronauts have ... simulated Space Shuttle landings.

potential

11. Virtual lab helps researchers simulate ... complicated flight situations.

12. Our country has great ... raw resources.

13. It has not realized its full ... yet.

Упражнение 4. Составьте возможные словосочетания глаголов из колонки А и существительных из колонки В.

A

1. simulate
2. complete
3. collaborate
4. withstand
5. succeed in
6. cover
7. make
8. overcome
9. deliver
10. carry
11. fly
12. open
13. find
14. guide

B

- a. solving a problem
- b. the distance
- c. passengers
- d. a pilot, an airplane
- e. the conditions of flight
- f. loads to remote regions
- g. at a speed
- h. a new era, age
- i. stresses, high temperatures
- j. landings, calculations
- k. problems, difficulties
- l. long-distance
- m. destination, use, application
- n. research, tests, study

Упражнение 5. А. Назовите 15–20 ключевых слов и словосочетаний на тему: «Aircraft of today, its safety, reliability, speed and comfort».

В. Speak about:

Virtual reality and its application in aerospace field.

LESSON 9

Условные придаточные предложения

Значения слова *provide*

Суффиксы *-th*, *-en*

Префиксы *sub-*, *under-*, *non-*

Text 9A. *Descending to New Ocean Depths*

Text 9B.

Text 9C. *Lifeboats*

Text 9D. *Greenwich*

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

Упражнение 1. А. Определите тип условного придаточного предложения, переведите.

1. If we look around, we can see that electricity is serving us in one way or another. 2. If I were free, I should help you with pleasure. 3. If we had tested this material, we should have used it in our work. 4. If ordinary gases are greatly compressed, they become liquids. 5. If supercomputers had not been used for thermodynamic calculations, designers would have spent all their lives on computations. 6. If you think that a computer never makes mistakes, you are wrong. 7. If extreme temperatures generated by atmospheric friction were not so high, a hypersonic craft would not require complicated cooling measures. 8. If we had been told about the lecture on reliability in spacecraft production, we should have come by all means. 9. Superconductivity can be obtained in some materials if the temperature is very low and close to absolute zero.

В. Поставьте глагол в скобках в соответствующую форму.

1. If you (to know) English well, you will be able to read books in the original. 2. If I get this book, I (to be) very happy. 3. You (to become) much stronger if you did your morning exercises regu-

larly. 4. If she went to work in France, she (to learn) French very quickly. 5. If he (to see) her, he would have spoken to her. 6. I (to help) them if I had been at home. 7. You (to write) the testwork well if you have learnt grammar. 8. If she (to ask) me yesterday, I should have told her about it. 9. If we had not been present at the lecture, we (not to understand) the new approach to the solution of the problem.

С. Закончите предложения.

1. I would work much better if 2. Life would be much simpler if 3. Use every opportunity to practice English if 4. I would have started to study English earlier, if 5. I would have had more opportunities, if

Упражнение 2. А. Измените предложения согласно образцам:

If I were free, I should help you. Were I free, I should help you.

If he had known about the lecture, he would have come. Had he known about the lecture, he would have come.

1. If it were possible, we should begin this work at once. 2. If he had had all the necessary books, he would have made his report in time. 3. If the books had been available in our library, we could have done this work much earlier. 4. If there were no computers, space flights would be impossible. 5. If drivers were more attentive while driving, there would be less accidents on the road.

В. Переведите бессоюзные условные придаточные предложения.

1. Had he used new materials, the device would have been more reliable. 2. Were electric motors used, cars would not pollute the air, would be practically noiseless and very easy to control. 3. Had they applied the new method, the result would have been much better. 4. Were the design of cars improved, the fuel consumption would be greatly reduced. 5. Had a less explosive gas been used in dirigibles at the beginning of the century, they would have been in operation since that time. 6. Were it possible to learn how birds find their way, people would use the principle to develop a navigation system for aviation.

Упражнение 3. Переведите предложения и запомните значения глагола *to provide* и союза *provided*.

1. The experiments conducted provided very good results. 2. Russian technological achievements that provided the launching of rockets are known all over the world. 3. A tire pressure display pro-

vides information for front and back pairs of tires. 4. Provided new composite materials are used, it will be possible to reduce overall aircraft weight. 5. Provided with a new vacuum-controlled carburetor this car model has several important advantages. 6. Superliners could develop a higher speed provided some special cooling measures were used. 7. An aircraft pilot can get all the information he needs provided he contacts a radio navigation station. 8. The work done provided us with new data. 9. Having measured the distance between two points, it is possible to calculate the time during which a car can cover it provided we know the car's average speed. 10. Our laboratory has been provided with the latest equipment.

Упражнение 4. А. Дайте степени сравнения для прилагательных.

great, easy, good, far, many, difficult, possible.

В. Поставьте *much* перед прилагательным в сравнительной степени (гораздо, намного), переведите.

late, simple, important, valuable, quick, reliable, useful, complex.

С. Переведите словосочетания.

гораздо (намного) раньше, гораздо (намного) длиннее, намного (гораздо) труднее, намного эффективнее, намного легче.

Упражнение 5. А. Найдите русские эквиваленты для словосочетаний.

as old as seagoing, a round container, the Swiss National Fair, as primitive as marine life, so-called, to take people deep into the lake, underwater tasks, around the ocean floor, wrist of the manipulator, to lift 120 pounds, marine life, the world's deepest vehicle, underwater helicopter.

швейцарская национальная ярмарка; подводные работы; опускать людей на большую глубину озера; по морскому дну; подводный вертолет; запястье манипулятора; морской животный и растительный мир; самый глубоководный в мире аппарат; такая же примитивная, как и морская среда (жизнь); так же стары, как мореплавание; так называемый; круглый контейнер; поднимать 120 фунтов.

В. Переведите словосочетания.

round glass container, marine life people watch around them, centuries before, to take people deeper than before, difficult underwater tasks, mounted on a metal platform, it looks like an underwa-

ter helicopter, move like a sport car, video cameras provide vision, to lift up to 120 pounds, work for up to nine hours.

СЛОВООБРАЗОВАНИЕ

Упражнение 6. Переведите следующие производные слова согласно образцу:

прилагательное + th = существительное,

deep — глубокий → depth — глубина

length, width, strength;

прилагательное + en = глагол

light — легкий → to lighten — облежить

deepen, brighten, lessen;

префиксы sub- (суб-, под-, до-), under- (под-, ниже, недо-)

submerge — погружать(ся) → submersible — подводный, погружаемый

estimate — оценивать → underestimate — недооценивать

subsystem, subsonic, subcommittee, subdivision, subsurface, submarine, undersea, underground, undercooling, underproduction, underdeveloped;

префикс non- (не-)

non-conductor — непроводник; non-military — невоенный

non-effective, non-essential, non-standard, non-metal, non-stop.

Упражнение 7. Прочитайте и переведите интернациональные слова.

ocean [ˈəʊʃən], container, apparatus [ˌæpəˈreɪtəs], machine [məˈʃiːn], spherical [ˈsferɪkəl], plastic, metal platform, helicopter [ˈhelɪkɒptə], manoeuvre [məˈnuːvə], sport, mechanical [mɪˈkænɪkəl], manipulator [məˈnɪpjuleɪtə], system, miniature [ˈmɪnjətʃə], microphone [ˈmaɪkrəfəʊn], to lift, minerals, battery, stereo [ˈstɪəriəʊ], construct, cultivate, videocamera, titanium [taɪˈteɪnjəm].

Упражнение 8. Прочитайте и запомните произношение слов.

descend [dɪˈsend], legend [ˈledʒənd], submerge [səbˈmɜːdʒ], submersible [səbˈmɜːsɪbl], da Vinci [ˈvɪntʃɪ], national [ˈnæʃənəl], Geneva [dʒɪˈniːvə], Japanese [ˌdʒæpəˈniːz], technician [tekˈnɪʃən], extreme [ɪksˈtriːm], precision [priˈsɪʒən], essentially [ɪˈsenʃəli],

cycloid ['saɪklɔɪd], particular [pə'tɪkjulə], wrist [rɪst], provide [prə'vaɪd], sample ['sɑ:mpl], image ['ɪmɪdʒ], scale [skeɪl], join [dʒɔɪn], politician [ˌpɒlɪ'tɪʃən].

СЛОВА И СЛОВСОЧЕТАНИЯ ДЛЯ ЗАПОМИНАНИЯ

accurate *a* — точный
almost *adv* — почти
advanced *p.p.* — новейший, передовой
collect *v* — собирать
construct *v* — строить, сооружать
crew *n* — экипаж
depth *n* — глубина
descend *v* — спускаться, опускаться
due to *prp* — благодаря, из-за
explore *v* — исследовать
find out *v* — выяснить, узнать
image *n* — изображение
instead of *adv* — вместо
join *v* — соединять, объединять
lift *v* — поднимать(ся)
mankind *n* — человечество
operate *v* — работать, действовать

particular *a* — данный, особенный, отдельный
penetrate *v* — проникать
precision *n* — точность
promise *v* — обещать
provided *cj* — при условии что; в том случае, если
realize *v* — осуществлять, реализовывать
resist *v* — сопротивляться, выдерживать
sample *n* — образец
submerge *v* — погружаться, опускаться вглубь
test *v* — проверять, подвергать испытанию
transparent *a* — прозрачный
try *v* — пытаться, пробовать

battery-operated *p.p.* — работающий на батареях

Text 9A

Прочитайте и переведите текст. Ответьте на следующие вопросы:
В каких странах ведутся работы по созданию погружаемых аппаратов?
Каковы особенности погружаемых аппаратов нового типа?

Descending to New Ocean Depths

We know little about the ocean yet. The dream of exploring under the waves is almost as old as seagoing. Legend says that Alexander the Great submerged himself in a round glass container, and Leonardo da Vinci designed a submersible vehicle in his notebooks centuries before Jules Verne wrote «Twenty Thousand Leagues Un-

der the Sea». If their dreams had been realized and such a craft had been constructed, mankind would have known about the secrets of Ocean much earlier. However, already during the Swiss National Fair in 1964 a submersible vehicle took thousands of people deep into Lake Geneva.

Not long ago, the crafts that penetrated the ocean depths were almost as primitive as the marine life they watched around them. However, non-military deep sea ships, so-called submersibles, were progressing rapidly. Russian, French, Japanese and American scientists are developing crafts that can submerge deeper, stay longer and find out more than earlier apparatuses.

Soon, one of the most advanced crafts, a one passenger submerging ship, will be tested. It may be able to take explorers and technicians deeper than ever before (up to 3,300 feet) and perform difficult underwater tasks with extreme precision.

This new submersible is essentially a spherical transparent plastic hull¹ mounted on a metal platform. It looks like an underwater helicopter and can manoeuvre itself in its water environment with some of the versatility² of a helicopter due to the use of a cycloid rotor³ instead of conventional marine-propeller screws⁴. It is expected that this apparatus will move around the ocean like a sports car.

However, the breakthrough⁵ that will make this particular craft quite different from other manned submersibles is a mechanical hand called the sensory manipulator system⁶. Miniature video cameras on the «wrist» of the manipulator provide it with vision and microphones enable the submersible to «hear». This manipulator system is designed to lift up to 120 pounds and will also be able to perform such accurate scientific work as collecting samples of ocean-floor minerals and marine life. When demonstrated, it lifted crystal glasses, drew pictures and wrote with a pen.

Some scientists are trying to develop the world's deepest manned submersible. When completed, it will be capable of submerging to the depths of 21,000 feet. Its crew will be in a pressure-resistant titanium-alloy cabin. This craft will be driven by a battery-operated electric motor and will work for up to nine hours. It will record images with colour television and stereo cameras and will collect samples by manipulating two robotic arms.

If such crafts are constructed on a large scale, we shall be able not only to spend our holidays enjoying the underwater life, but also grow and cultivate sea plants, fish and pearls. It will be possible provided scientists, designers and politicians from all over the world join their efforts and solve the most important problems in this field.

Notes to the Text

1. transparent plastic hull — прозрачный пластмассовый корпус
2. versatility — свобода передвижения
3. cycloid rotor — несущий винт циклоидного типа
4. marine-propeller screw — судовой гребной винт
5. breakthrough — радикальное решение
6. sensory manipulator system — сенсорная система манипулятора

УПРАЖНЕНИЯ

Упражнение 9. Просмотрите текст 9А и ответьте на вопросы.

1. What is the text about?
2. What is a submersible?
3. Who was the first to think of a submersible vehicle?
4. What writer wrote about a submersible?
5. What special systems will be used on a new submersible?
6. What are the characteristics of the manipulator system?
7. What kind of submersible is being designed at present?
8. What do you think of the future of such vehicles?
9. What is the name of the famous French scientist, an explorer of the ocean?
10. Have you seen his film? Have you read his books?

Упражнение 10. Укажите, какие утверждения соответствуют содержанию текста 9А. Исправьте неправильные.

1. We know very little about the ocean yet.
2. The dream of exploring the underwater life is very old.
3. It was Jules Verne who was the first to write about a submersible vehicle.
4. Only Japanese scientists are developing deep water submersible crafts.
5. A new submersible craft looks and moves like an underwater helicopter.
6. A new submersible is provided with a manipulator that is designed to lift 120 tons.
7. When demonstrated, it lifted crystal glass and drew pictures.
8. When completed, the world's deepest manned submersible will be capable of submerging to the depth of 21,000 feet.
9. This craft will be driven by a battery-operated electric motor.

Упражнение 11. Найдите в тексте 9А условные придаточные предложения; сделайте, где возможно, их бессоюзными.

Упражнение 12. Найдите условные придаточные предложения, выражающие нереальные действия. Переведите.

1. If a scientific research is closely linked with practice, the results are always good.
2. If you looked at the equipment of 1946,

you would notice the difference with that available at present. 3. If there is a pressure change in the tires, a transmitter signals to adjust the pressure. 4. If we were to make a journey in a plane to the nearest star, we should have to travel for several thousand centuries. 5. Were traffic controlled by computers, cars could travel with safety and speed. 6. Had submersibles been developed since the time of Alexander the Great, mankind would have used natural resources from the ocean floor and cultivated plants and fish there. 7. Had all submersibles had autonomous principle of operation, they would have become much more useful. 8. If fire-arms had not been invented, the secret of Damascus steel would not have been lost. 9. If we could make a non-stop flight around the sun in an airplane at a speed about 300 km per hour, it would require 565 days to encircle it at the equator. 10. If the satellite speed is less than necessary, it will go down from the orbit and enter the atmosphere.

Упражнение 13. Переведите предложения, обращая внимание на различные значения слов *provide, if (whether)*.

1. Specialists reported that a miniature video camera provided the latest submersible with vision. 2. The speed of a satellite would be less provided it moved at a greater distance from the Earth. 3. Drivers don't know yet whether radars will be mounted on the next car models. 4. If the weather is too bad for flying, passenger airplanes don't leave airports. 5. It was very important to find out if electricity could be used for long distance communication. 6. During the entire flight, the pilot is provided with all the necessary information about weather conditions. 7. Modern submersibles can remain at the depth of 20,000 feet for eight hours or, if needed, as long as two or three days. 8. A new system for motor cars can be provided with infrared sensors that can detect a human figure at night. 9. If underwater tourism continued to develop at the present rate, the number of passengers could grow up to millions in only a few years.

Упражнение 14. Переведите предложения с союзом *unless* и запомните особенности его перевода.

1. Isaac Newton stated that a body would continue moving unless some force was applied to stop it. 2. Space flights would be impossible unless special materials for space vehicles were produced. 3. We should have no radio, telephone, television or computers unless there were electricity. 4. The earth temperature would increase indefinitely unless heat were radiated. 5. Unless the temperature rises, the speed of the molecules will not increase. 6. It would have

been impossible to send satellites into orbit unless Newton's laws of motion had been studied. 7. With heat generated by friction of the air on aircraft surface, the temperature inside the cabin would increase to almost 1,000 °C unless it were cooled by mechanical means.

УПРАЖНЕНИЯ ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ

Упражнение 15. Образуйте от следующих слов:

а) глаголы

usage, subdivision, indication, complication, difference, large, systematisation, appearance, changeable, measurable;

б) существительные

noiseless, powerful, deep, dangerous, perform, realise, lighten.

Упражнение 16. Образуйте производные от следующих слов:

manipulate, compress, move.

Упражнение 17. Найдите русскому слову соответствующее английское.

исследовать — exploration, explorer, to explore;

точно — exactness, exactly, exact, exaction;

погруженный — submergence, submerge, submerged, submersion;

направлять — navigate, navigable, navigation;

стойкий — resistance, to resist, resistant, resistor;

ширина — wide, width, widely, widen.

Упражнение 18. Найдите:

а) синонимы

to finish, to submerge, to work, craft, to build, to descend, vehicle, to operate, rapid, fast, to construct, to complete;

б) антонимы

to lift, difficult, to complete, after, to descend, before, easy, to start.

Упражнение 19. Определите, какой частью речи являются выделенные слова; переведите предложения.

1. In a new apparatus rotors mounted on the fuselage provide **lift** acting as wings when the craft is moving at high velocity. 2. The aerostatic apparatuses of the latest design can vary its **lift** force. 3. The man can't **lift** this weight, it can be **lifted** only automatically. 4. When weight is **lifted** to a given level, it possesses potential

energy due to its position. 5. Russia possesses the world's heaviest helicopters MI-26 which **lift** and transport cargoes up to 20 tons.

Упражнение 20. Переведите предложения, обращая внимание на значения слов *before* и *after* в функции предлога и союза.

1. There was no means of direct communication before the telephone was invented. 2. After World War 1 dirigibles gradually lost their significance as a means of transportation. 3. Before Newton no one could explain why the planets moved around the sun. 4. After a French engineer invented the first self-propelled road vehicle in 1770, many car designers wanted to make a better automobile. 5. Before each flight pilots must ask for the information about the weather expected during the planned route. 6. The «night vision» system enables drivers to see better after dark. 7. Before the industrial production of materials in space can be started, it is necessary to create special space stations. 8. Soon after Karl Marx's arrival in England he became a daily visitor of the Reading Room of the British Museum.

Упражнение 21. Выберите соответствующий глагол из приведенных в скобках.

1. A young physicist can (get, get up) a prize for his work. 2. Designers tested a new engine to (find, find out) whether the ceramics it was made of could withstand temperatures up to 1,000 °C. 3. It is difficult to (get, get up) early in winter. 4. Many specialists are working at the problem of developing a new kind of telephone which we (call, call for) «video phone». 5. The projects in Siberia (call, call for) the most effective means of transporting various cargoes over long distances. 6. Specialists wanted to (find, find out) whether telephone communication was reliable or not. 7. Further development (call, call for) new specialists who are able to generate new technical ideas. 8. New generation materials which we (call, call for) composite materials will allow to lighten the aircraft. 9. To translate this text, we must (find, find out) some words in a dictionary.

Упражнение 22. Укажите предложения, где выделенное слово имеет следующее значение:

— действуя

1. They should know in what direction this force is **acting**. 2. **Acting** upon the body the force changes. 3. They should find the force, **acting** upon the body.

— имеет дело, рассматривает

1. Thermodynamics is the branch of physics **dealing** with the transformation of heat into work. 2. The experience of France **dealing** with environmental problems is very important. 3. Now Russia is **dealing** very seriously with the problem of Baikal protection.

— используя

1. **Using** thermomagnetic alloys in the turbine rotor allows to develop a lot of various sensors. 2. By **using** thermomagnetic alloys it is possible to develop a lot of various sensors. 3. Many American companies began **using** submersibles for tourism.

— совершенствование

1. Construction specialists are working at **improving** the design of metro escalators. 2. While **improving** the design of metro escalators specialists developed a two speed escalator. 3. Our design bureau has developed spiral escalators **improving** the construction of public buildings.

— превышающий

1. A car **exceeding** its speed, the indicators show it on the display. 2. **Exceeding** the speed limit the driver should be very attentive. 3. There are relatively few cargoes **exceeding** 400 tons.

Упражнение 23. А. Прочитайте текст без словаря.

Three Stonecutters

Three stonecutters (каменотес) were working hard. A man who was passing by watched them for a few minutes and then, turning to the first stonecutter, he asked: «What are you doing, my friend?» «I am working like a slave (паб). Look at my hands. Did you think I was playing?», he replied. The passer-by then looked at the second workman. «And what are you doing?», he asked. The stone-cutter answered quickly, «I am earning seven dollars and fifty cents a day. I hope to receive at least nine dollars a day in a very near future.» The visitor studied the face of the third stonecutter. Once more, he asked, «And what are you doing, my friend?» The stonecutter's face lighted up as he replied, «I am helping to erect a magnificent building. Look at the colour in this piece of marble. I was just thinking how beautiful it will be when it is thoroughly polished. This building will last for hundreds of years and its beauty will inspire everyone who sees it.»

В. Составьте предложения в соответствии с содержанием текста А.

1. The first stonecutter was the unhappiest of the three because	1. he saw beauty and joy in his work.
2. The second one was happier than the first stonecutter because	2. he thought that all work was hard and dull.
3. The third stonecutter was the happiest of the three because	3. he thought that honest work brings advancement.

Упражнение 24. Дайте недостающие формы глаголов, запомните их.

drawn, grew, feeling, wake up, drank, cutting, sink.

Упражнение 25. Прочитайте и переведите текст без словаря.

Deep Trouble

An experimental undersea telephone cable in the Canary Islands had to be lifted from the ocean floor three times because of breakage. Each time sharks' (акула) teeth were found in the damaged cable. Though the cable contains optical fibres transmitting signals in the form of light, it carries a very small amount of electrical wires. It is known that electricity attracts sharks. Therefore, ordinary electric power cables are usually provided with some kind of protection to stop their being attacked by sharks. However, it was not expected that it was necessary to mount this expensive protection on the new cable. But provided the designers had used this conventional protection on the new cable, the sharks would not have approached it.

CONVERSATION

Exercise 1. Answer the questions.

1. What apparatuses are used for exploring the ocean depths at present? (non-military submersibles) 2. What countries are developing such submersibles? (Russia, the USA, France and Japan) 3. What kind of submersible is being designed? (an advanced manned submersible) 4. What is the depth it is capable to submerge to? (21,000 feet) 5. What motor is used in it? (a battery-operated electric motor) 6. What devices are provided for collecting samples from the ocean floor? (robotic manipulators) 7. What is the practical application of the submersible? (cultivating sea plants, fish and pearls)

Exercise 2. Make a sentence out of the two parts.

1. A new one-passenger submersible is designed for performing	1. an underwater helicopter.
2. This submersible is a spherical transparent plastic apparatus	2. to the depth of 3,300 feet.
3. It looks like	3. this apparatus will move like a sports car.
4. It can move in water environment	4. its sensory manipulator with miniature video cameras and microphones.
5. While exploring the ocean floor	5. accurate scientific explorations.
6. The apparatus is capable to descend	6. due to the use of rotor instead of conventional propeller.
7. A special feature of this manned submersible is	7. mounted on a metal platform.

Exercise 3. Read and learn.

Hiking in the Mountains

Mike: My steps become lighter because I hear the music of running water. Let's stand and look at the stream.

Jane: Why only look? I'm thirsty (хочу пить) and nothing tastes so good as cool mountain water.

M.: But passing the same water through the pores of the skin does the body fifteen times as much good as it does when you drink it. Put your hands and arms into the deepest place and keep them for a while and you'll feel so wonderful.

J.: I can't stop drinking. Look at the clear, smooth surface of the stream. Water is beautiful.

M.: And perhaps, the most beautiful thing about it is its use. It helps all living things in one way or another.

J.: I know that my own body is eighty-five per cent water.

M.: Yes, and this water keeps you going in spite of the weather.

J.: How does it do this?

M.: By circulation it keeps your body at the same temperature all the time.

J.: I've read that water has the most interesting properties of all liquids. It is the slowest to cool and the slowest to heat.

M.: In winter the water in your body keeps you warm by circulating evenly to all parts. In the heat of summer it passes off through the million of pores of your skin. This keeps you cool and takes away toxic material at the same time.

- J.: I think the great supply of water in the body is one of the nature's great provisions.
- M.: Sure, especially taking into consideration (принимать во внимание) that the human being can live only within the narrow range (диапазон) in body temperature of a very few degrees Fahrenheit. Have you had enough water?
- J.: Yes, I have. Usually I drink at least six glassfuls of water daily.

Exercise 4. Speak about:

1. An advanced manned submersible.
2. Practical applications of manned submersibles.

Use exercises 1, 2 and the following words and word combinations for your topic: to realize a dream, underwater exploration, to penetrate, a submersible vehicle, to descend to a depth up to, to perform tasks, collecting samples of minerals and marine life, to work for nine hours, to join efforts.

Exercise 5. Comment on the following statement.

Scientists cannot afford (позволить себе) to be interested in things not connected with their subject.

One point of view : There is no alternative to narrow (узкий) specialization, everybody has a limited amount of time, it is unrealistic to expect a scientist to be interested in other fields than his own, a person who is interested in many things is sure to become a dilettante.

A contrary point of view : It is impossible to understand a particular science in complete isolation, the scientist should not be treated as a machine for solving specialized problems, a narrow specialist may tend to become a narrow -minded person, really great scientists have always had wide interests.

What do you think about it? Why?

Exercise 6. A. Read and say what you think about tea and what it does for you.

Tea

The English know how to make tea and what it does for you. Seven cups of it wake you up in the morning; nine cups will put you to sleep at night.

If you are hot, tea will cool you off, and if you are cold, it will warm you up.

If you take it in the middle of the morning, it will stimulate you for further work; if you drink it in the afternoon, it will relax you for further thought. Then, of course, you drink lots of it in off hours (свободное время).

The test of good tea is simple. If a spoon stands in it, then it is strong enough.

B. Use the following phrases.

1. If you ask me, tea...
2. If you want my opinion, tea...
3. I entirely / quite agree with the idea that...
4. That's exactly my opinion / that's exactly what I feel...
5. I don't like tea because...

Exercise 7. Read and smile.

A Fable from Aesop ['i:sɒp]

While sitting together one time, a group of animals was discussing the popularity of the elephant. They all agreed that the elephant was the most popular animal in the forest, but none of them could give a satisfactory explanation of this fact. Yet they all had certain comments to offer.

The giraffe [dʒɪ'rɑ:f] said, «If the elephant had a long neck like mine, then it would be easy to understand his popularity. He would be the tallest animal in the forest».

The peacock (павлин) said, «If he possessed my beautiful tail, it would be easy to understand. He would be the most beautiful creature in the forest».

The rabbit said, «If he could run as fast as I, it would be easy to understand. He would be the fastest animal in the forest».

The bear said, «If he was as strong as I, it would be easy to understand. He would be the strongest animal in the forest».

Suddenly the elephant himself appeared. He was larger and stronger than any of the other animals, and he was also superior in many ways. But he was always quiet and modest about his many accomplishments. This, after all, was the real explanation for his popularity.

An American lady got into a smoking carriage (вагон) where an Englishman was smoking a pipe.

She began doing everything to show him she objected to his smoking. At last, seeing that the man paid no attention, she said, «If you were a gentleman, you would stop smoking when a lady got into the carriage».

«If you were a lady», replied the Englishman, «you would not get into a smoking carriage».

«If you were my husband», said the American lady angrily, «I would give you poison (яд)».

«Well,» said the Englishman at last, «if I were your husband, I would take it».

Text 9B

Прочитайте текст и озаглавьте его. Ответьте на следующие вопросы:

Какую новую информацию вы нашли в тексте?

За счет чего можно устранить недостатки в существующих погружаемых аппаратах?

Now most submersibles are connected with a support ship on the surface. This connection is an armoured cable measuring an inch or two in diameter and weighing up to 10 tons and it transmits power and navigational commands to the submersible, as well as sends sensor data and television images back to the support ship. Cables allow submersibles to transmit data at a great speed, but they limit the range of territory studied and have many disadvantages in operation.

Autonomous underwater submersibles can move freely. Controlled by on-board microprocessors or by acoustic signals transmitted by a ship on the surface, battery-operated submersibles can cover much greater areas. They can operate under ice and in very deep water. Such three-ton unmanned crafts can submerge to the depth of almost 20,000 feet and stay there for up to seven hours. High quality images of the ocean bottom can be transmitted to the support ship in three to four seconds (because of the slow speed — about 5,000 feet per second through water — acoustic data transmission is much less quick than signals sent via cable which travel at the speed of light).

But even these most advanced submersibles have definite disadvantages: batteries are heavy, data transmission is slow and computer programs are primitive. Future submersibles may overcome those difficulties. Some may be propelled by nuclear power or by fuel cells (топливные элементы) that use oxygen from the sea water. Many of them will rely on signal-compression techniques to speed up acoustic data links. Computerized systems will enable some submersibles to repair damaged telephone cables or oil platforms. If research work in this field continues to expand at its present rate, the number of radically different kind of more efficient crafts will appear very soon.

Text 9C

Прочитайте текст. Назовите особенности современного спасательного средства на воде и принцип его действия.

Lifeboats

Even though we now have ships of a kind unknown in earlier centuries, we are still very far from mastering the sea. The Greek

sailor who was shipwrecked (терпеть кораблекрушение) on his way home from Troy and the sailor of tomorrow whose nuclear-powered cargo ship might be on fire both face the same dangers. They may drown (тонуть), and so they need to keep afloat. They may die, and so they need to keep themselves covered and dry. Rescuers (спасатель) may never find them, and so they need to send signals.

The Greek sailor at the time of the Trojan war had only a small chance of survival (спасение). The sailor of tomorrow has a greater chance, especially if the ship has one of the new rescue crafts on board.

One such lifeboat looks more like a flying saucer (тарелка) than a boat. Sailors on board a ship which is in trouble can get into the capsule, close the water-tight doors and operate the controls which drop the capsule automatically into the sea. Made of glass fibre (стекловолокно) the capsule will float on the sea and will not be dragged down by the sinking ship. It will protect the men inside from explosions, fire and extreme cold. It has a thirty-kilowatt diesel engine and so can carry survivors to the coast. To help rescue ship and aircraft to find it, the upper part of the capsule is covered with a special orange paint which can be detected by radar. Each capsule is large enough for twenty eight men.

Text 9D

Прочитайте текст. Расскажите по-английски, что вы узнали об истории Гринвича и его сегодняшнем дне.

Greenwich

Greenwich is on the river Thames, five miles from the middle of London, and its story is 2,000 years old. The first English people — the Saxons — were fishermen there and they gave Greenwich its name — «the green village».

You can still walk along the old Roman road in Greenwich park. But the river was the true road to the outside world for the Romans and for English kings and queens who later lived in Greenwich.

The King Henry VIII loved this place. He knew that England must be strong at sea. So two big shipyards were started at Greenwich and for 350 years the ships made there were the best in the world.

Many ships were lost at sea — their sailors did not know how to tell exactly where they were.

In the 17th century astronomer Flamstead tried to find the answer. He worked in an Observatory on the high ground in Greenwich park. The walls of its big light-sided (непрочной) room shook

when the weather was bad. But from it, with a telescope made by himself, Flamstead could look all round the sky. And he did look night after night for twenty years. Carrying on Flamstead's work a hundred years later, an astronomer called Harrison finally made a clock which told the time at sea and helped sailors to know where they were. You can see Harrison's clock, still working in Greenwich museum of the sea. Because of Flamstead's work every country in the world now tells its time by Greenwich time.

Every year a million people come to Greenwich to see its museums and palaces and its two famous ships: one old, one new. Both the big CUTTY SARK and the little GYPSY MOTH sailed through dangerous waters before they came safely back to their Greenwich home. At the end of the 1800's the CUTTY SARK was the fastest ship of its size. Carrying more than a million kilos of tea, she travelled the 25,000 kilometers from China to England in only hundred days.

Next to the CUTTY SARK is the GYPSY MOTH — only 16.5 metres long, but full of newest equipment. Her captain Sir F. Chichester wanted his ship to sail as far and as fast as the CUTTY SARK. When he sailed round the world by himself in GYPSY MOTH in 1966 — the first man ever to do this — he took a flag from the CUTTY SARK with him.

ДОПОЛНИТЕЛЬНЫЕ ЗАДАНИЯ

Упражнение 1. Найдите в тексте 9А:

- а) ключевые слова со значением *deep sea ship*; переведите их;
- б) словосочетания с *under* и близкие по значению выражения, переведите их;
- в) слово *marine* и словосочетания с ним; поясните их и приведите примеры.

Упражнение 2. А. Прочитайте текст. Постарайтесь догадаться о значении термина *scuba divers*.

A computer for scuba divers will provide in one device information about time, depth and air supply. It is to be used together with special divers' tables. A display will provide visual information and audible warnings about critical conditions.

If a diver wants to know an accurate depth he is down, he must set water type he is in. If he is in the sea, he will set «sea water», otherwise he will set «fresh water». The device shows the diver's current depth in meters and the level of power left in the batteries. It will indicate if the level is low, medium or high.

If a diver wants to know how long he has been down, he can see this from the display. If a diver needs to spend some minutes at a certain depth for decompression, he will start his stop watch, and will wait until the time has elapsed (passed). If a diver wants to know the amount of air left in the tank, he can see this from the contents display.

A warning signal tells him when he must start his ascent. Before he descends, the diver sets the time to ascend. If he began his ascent before the display started flashing, he would be within safe limits. If he did not ascend then, he would expose himself to decompression sickness. If he started his ascent and went up too quickly, he would see a warning light «Too fast». Then he should slow down his ascent.

В. Объясните на английском языке значения следующих слов и словосочетаний: *scuba diving, stop watch, display flashing, air tank content, expose oneself to decompression sickness*. Переведите их.

С. Найдите в тексте дополнительное придаточное предложение с союзом *if*.

Д. Заполните пропуски антонимами выделенных слов.

- 1. Tables give information about **safe** and ... diving limit,
- 2. Time information is the time from **the beginning** of the diver's descent to the ... of his ...
- 3. If a diver is in the sea, he will set «**sea water**», otherwise he will set ...
- 4. Battery level information indicates if the level is **low** or ...
- 5. Before a diver starts to **descend**, he should set the time when he must ...

Е. Заполните таблицу на словообразование.

Verb	Noun	Adjective
...	submergence	...
...	...	exploratory
popularize	...	...
...	creature	...
—	...	sick
...	performance	—
...	...	connective
...	exposure	—
...	...	definite

Упражнение 3. Составьте возможные словосочетания глаголов из колонки А и существительных из колонки В.

А	В
1. realize	a. data, images
2. master / penetrate	b. areas
3. join	c. at a rate of
4. submerge	d. the sea and ocean depths
5. descend / ascend	e. a dream
6. be	f. efforts
7. cover	g. within safe limits
8. transmit	h. to the depth of

Упражнение 4. Заполните пропуски, образуя составные слова, общеизвестные словосочетания и термины. Запомните их.

1. battery-...	7. ocean-... minerals
2. ... warning	8. ... arms
3. visual ...	9. support ...
4. ... diving	10. life ... system
5. stop ...	11. one ...
6. ... plants	12. ... camera

Упражнение 5. А. Назовите 15–20 ключевых слов и словосочетаний на тему: «New developments in manned submersibles».

В. Speak about:

Modern scuba diving.

REVISION OF LESSONS 7-9

Упражнение 1. Повторите причастия I, II, герундий и условные придаточные предложения. Переведите.

1. Bob is very good at solving mathematical equations. 2. She has never done any computing. 3. We saw an old man lying on the road. 4. Being a disabled, he could not drive a car. 5. The train being late, they decided to return home. 6. His favourite pastime is playing computer games. 7. Realizing the danger, they stopped. 8. The house rebuilt recently is very beautiful. 9. Look at the displayed objects! Look at the objects being displayed! 10. Graphic artists like adding colour and depth to their drawings and designs. 11. Having completed the job, the man left early. 12. The task having been accomplished, the pilot returned to the base. 13. Having been rebuilt recently, the house is very attractive now. 14. Scientists are interested in developing new programming languages. 15. What do you think of the methods being used in these experiments? 16. Our engineers will discuss the methods used and the results obtained. 17. Given certain conditions such work can be done by anybody. 18. The speed of a microprocessor is very important in processing information. 19. A fax machine is used for sending and receiving copies of original documents via a phone line. 20. Joystick is an input device especially helpful when playing computer games. 21. Distance measuring equipment now being used in all airplanes, pilots know exactly their position and speed. 22. Provided electronic and radio navigation equipment had not been improved so radically in recent years, aircraft flying would not have been so reliable and efficient. 23. Manhattan, one of the New York boroughs, is not large in size and population, people coming there only for work, to the theaters, museums and clubs. 24. If you got tired while getting ready for your exam, you should break off for half an hour. 25. We learnt of the engineers' having invented a wheel-computerized system that monitors and adjusts air-pressure in tyres. 26. Most submersibles do not move very far from the support ship, the connecting cables limiting their range. 27. Unless the internal combustion engine had been invented, the automobile industry would not have begun to develop so rapidly all over the world. 28. When completed, the new dirigible will be the largest and the most powerful one. 29. Hundreds of radio navigation stations being located at different places around the world, pilots are at constant link with them. 30. The principles of ecology are as real as those of aerodynamics. If an aircraft is to fly, it has to satisfy certain criteria of thrust and lift. Similarly, if an economy is to keep up progress, it must satisfy the basic principles of ecology. If it does not, it will decline (приходить в упадок).

Упражнение 2. Прочитайте и переведите текст, обращая внимание на грамматику уроков 7–9.

How It Works

Fuel warning light. Many cars have a fuel warning light. The level of fuel (petrol) in the tank being very low, this light switches on and the driver can see that he needs more petrol. How does this fuel warning light work?

The level of the fuel falling, the float moves downwards. When this happens, the arm also moves downwards and makes the lever touch an electrical contact, thus switching on the fuel light in the car.

Seeing the fuel warning light, the driver puts more petrol into the tank. This makes the fuel level rise and pushes the float upwards. When risen, the float makes the arm move upwards and this causes the level to move upwards also. The fuel warning light then switches off.

A car cooling system. Most car engines are cooled by water. The water flows around the engine and then passes through the radiator. It then passes through the water pump and around the engine again.

Thus, there are several stages in this cycle:

1. Water flows around the engine. The engine is cooled and water is heated.

2. When heated, the hot water enters the radiator through the top hose (шланг).

3. Flowing down through the radiator, the hot water is cooled by air. The air is drawn through the radiator by a fan (вентилятор). This fan is turned by a belt, which is driven by the engine. The cool water leaves the radiator through the bottom hose. The water is pumped around the engine again.

Finding a fault in a car. If your car doesn't start in the morning, you should check three things first: the battery, the fuel level and the spark plugs (свеча зажигания). It is easy to repair these faults. If the battery is flat, you should recharge it. If this doesn't work, you should replace it. If the petrol tank is empty, fill it up. If the spark plugs are dirty, clean them, and if the gap in a spark plug is too narrow or too wide, adjust it to the correct width.

If your car still doesn't start, the petrol pump may be broken, or the fuel pipe may be blocked. If the pump is broken, it must be repaired or replaced. If the fuel pipe is blocked, take it off and unblock it.

If there is a loud click when you turn the key, the starter motor may be jammed (заклинивать). If it is, you can try to release it by pushing the car forwards and backwards (in 2nd gear). If the car still doesn't start, the starter motor should be repaired or replaced.

Упражнение 3. Заполните пропуски следующими словами:

flat	be repaired	click	recharge	faults	battery	clean	tank	empty
replace	fuel	wide	spark plugs	cooling	backwards	narrow	forwards	

1. In a car the flat battery, the empty fuel tank and the dirty spark plugs are the ... that can be easily eliminated. 2. If your car doesn't start, check the ... and the fuel 3. If the battery is flat, try to ... or ... it. 4. If the ... tank is ... , fill it with petrol. 5. If the ... are dirty, ... them. 6. Adjust the gap in a spark plug if it is too ... or too 7. If the petrol pump is broken, it must 8. If the tyres are ... , you should pump them up. 9. If you hear a loud ... , while turning the key, the starter motor may be jammed. 10. If it is jammed, try to move the car ... or 11. If the engine becomes too hot, there is a fault in the ... system.

Упражнение 4. А. Прочитайте текст.

Automotive Engines

Speaking about automotive engines one should say that the two most common types of engine for land vehicles are the petrol engine and the diesel engine.

Since petrol engines are usually lighter and smaller than diesel engines, they are cheaper. Therefore, most cars and motorbikes use petrol engines. Petrol engines are also less noisy than diesel engines. They usually go faster. On the other hand, diesel engines use less fuel and last longer than petrol engines, and this is why larger vehicles such as trucks and trains use them. They are also safer than petrol engines, because there is less danger of fire.

There are two main types of petrol engine — 4-stroke and 2-stroke. All cars and larger motor-cycles use 4-stroke engines. But most smaller motorbikes use 2-stroke engines. These are lighter and smaller than 4-stroke engines, and are therefore cheaper.

В. Ответьте на вопросы.

1. Which is the lightest of the three engines (2-stroke, 4-stroke or diesel)? 2. Which is the least expensive? 3. Which is the noisiest? 4. Which is the largest? 5. Which is the safest? Why? 6. Which has the lowest fuel consumption?

С. Speak about:

The main systems of a car.

LESSON 10

Инфинитив, формы и функции

Конструкция *there + сказуемое*

Глаголы *to cause, to make, to force*

Text 10A. *Laser*

Text 10B. *Optical Technology*

Text 10C. *An Encyclopedia on a Tiny Crystal*

Text 10D. *Science and International Cooperation*

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

Упражнение 1. Определите функции инфинитива в предложениях, переведите.

1. To develop a new submersible craft with a manipulator is not an easy task. 2. To develop the supercomputer, highly developed electronics and new materials were required. 3. One of the best ways to keep the car speed steady is to use a computer. 4. Experiments helped Mendeleev to discover the properties of new chemical elements. 5. Francis Chichester was the first to sail round the world by himself. 6. Some materials with new useful properties may be produced in space. 7. A special electronic device signals the engine to stop. 8. Radar may control the brakes to avoid collisions with other cars. 9. High temperature alloys make it possible for jet engines to be operating under severe conditions for a long period of time. 10. Recently a radar to be mounted on cars has been developed. 11. In a new Japanese car the information to be received by the driver will come through a navigation earth satellite. 12. To help helicopters and aircraft find the capsule, its upper part is covered with special paint which can be detected by radar. 13. To detect objects at a distance such as ships, aircrafts, buildings, mountains, etc. is of great importance for navigation both at sea and in air. 14. The radar detects the stationary objects ahead of the

car to warn the driver about them and slow down the speed. 15. We had fresh water to drink. 16. They returned to listen about our accident and help. 17. He asked permission to leave.

Упражнение 2. Переведите согласно образцам:

There are many ways ... — Существует много способов ...

There has appeared a new kind of vehicle. — Появился новый вид аппарата.

There is no doubt ... — Нет сомнения ...

1. There are unique conditions in space for producing materials with special qualities. 2. There exist different designs of submersible crafts in several countries. 3. There remains one more test to be carried out before using the device. 4. There has recently appeared a new way of communication through satellite networks. 5. There is no doubt that soon we shall see the appearance of a new kind of superliners and space crafts. 6. We have read that there exists an international organization that makes it possible to keep telephone and telegraph communication via satellite with ships in any part of the World Ocean. 7. There is no doubt that mankind will be able to explore the solar system by using nuclear rockets. But there still remain a lot of problems to be solved.

Упражнение 3. Переведите предложения и запомните значения глаголов *to cause, to make, to force*.

1. Weather changes are often caused by cyclones and anticyclones. 2. Work with deaf people made Al. Bell look for a way to help them and he began to study the theory of sound. 3. In internal combustion engines the pressure of gases forces the piston to go down. 4. The fact that Sofia Kovalevskaya couldn't continue her studies in Russia made her leave for Germany. 5. Heating causes the motion of molecules in a substance, the hotter it becomes, the quicker the molecules move. 6. Morse's interest in electricity made him start experimenting with it. 7. Sometimes bad weather forces the aircrafts to land. 8. In ordinary air it is possible to make electrons jump through space by means of pressure of high voltage. 9. The manager made Mary copy the report again. 10. They made him wait for an hour.

Упражнение 4. Переведите предложения, учитывая особенности сочетания прилагательного с наречием *enough*.

1. Materials used for superliner structures must be strong enough to withstand the air resistance at high speeds. 2. The «night vision» system is to be small enough to be used in automobiles.

3. The film must be interesting enough since everyone has already seen it. 4. New materials for hypersonic craft should be light enough because the weight of the aircraft structure is of the greatest importance. 5. Infrared rays emitted by any object on the road are to be intensive enough for sensors to pick them up. 6. The Voice Warning system for cars requires the connection of 18 wires, but it is simple enough to be installed in a car.

Упражнение 5. А. Найдите русские эквиваленты для словосочетаний.

before the turn of the century, fantastic story, sword of heat, mysterious sword of heat, has come to reality, the name stands for, light amplification, stimulated emission, mankind's oldest dream, to make lead run like water, technological tool, thermonuclear fuel, to have no time to disintegrate, experiments in heating, required temperature, dozens of times greater, in just a fraction of a second.

технологическое средство, заставить свинец литься как вода, название означает, старейшая мечта человечества, усиление света, в конце прошлого века, индуцированная эмиссия (излучение), огненный меч, таинственный огненный меч, воплотилось в реальность, фантастическая история, эксперименты по нагреву, требуемая температура, термоядерное топливо, нет времени для распада, в десятки раз больше, всего за долю секунды.

В. Переведите словосочетания.

a very pure colour, to vaporize the hardest materials, to vaporize any substance on the earth, to combine two technological discoveries, limitless source of energy, practically limitless source of energy, thermonuclear fuel, thermonuclear reaction, controlled thermonuclear reaction, current estimates, a billionth of a second, to work hard.

Упражнение 6. Прочитайте и переведите интернациональные слова.

fantastic [fæn'tæstɪk], Martians ['mɑ:ʃjənz], to stimulate ['stimjuleɪt], laser ['leɪzə], colour ['kʌlə], thermonuclear reaction, controlled thermonuclear reaction, energy, plasma ['plæzmə], dozens ['dʌznz], practice ['præktɪs], practical ['præktɪkəl], potential [pəu'tenʃəl], intensive, intensity, principle, to vibrate [vaɪ'breɪt], fraction, project ['prɒdʒekt], transmission, solar transmission, realise ['rɪəlaɪz], effect [ɪ'fekt], Encyclopaedia [en,saɪkləu'pi:dʒə].

Упражнение 7. Прочитайте и запомните произношение слов.

world [wə:ld], turn [tə:n], earth [ə:θ], invade [ɪn'veɪd], sword [sɔ:d], heat [hi:t], beam [bi:m], pure [pjʊə], mankind [mæn'kaɪnd], enough [ɪ'nʌf], vaporize ['veɪpəraɪz], lead [led], focused ['fəʊkəst], treatment ['tri:tmənt], vary ['vɛəri], varied ['vɛərɪd], suggest [sə'dʒest], magic ['mædʒɪk], problem ['prɒbləm], combine [kəm'baɪn], source [sɔ:s], contribute [kən'trɪbjʊ:t], duration [dʒuə'reɪʃən], pulse [pʌls], though [ðəʊ], encounter [ɪn'kaʊntə], encode [ɪn'kəʊd], surface ['sə:fɪs], therefore ['ðɛəfɔ:], doubt [daʊt], entire [ɪn'taɪə], weapon ['wepən].

СЛОВА И СЛОВСОЧЕТАНИЯ ДЛЯ ЗАПОМИНАНИЯ

amplification *n* — усиление
as well *adv* — также
approximately *adv* — почти, приблизительно
capacity *n* — мощность, нагрузка, производительность
conduct *v* — вести, проводить
cost *n* — стоимость
duration *n* — продолжительность
enough *adv* — достаточно, довольно
entire *a* — полный, целый
fulfilment *n* — выполнение, осуществление, исполнение
single *a* — один, одиночный
suggest *v* — предлагать, советовать
tool *n* — инструмент, орудие, средство

heat *v* — нагревать; *n* — тепло, теплота
heating *n* — нагрев
heat-resistant *a* — теплостойкий
indeed *adv* — действительно, на самом деле
installation *n* — установка, сборка
involved *p.II* — связанный, рассматриваемый, имеющий место
rapidly *adv* — быстро
represent *v* — представлять, олицетворять
stimulate *v* — возбуждать, индуцировать
treatment *n* — обработка
vary *v* — менять, изменять(ся)
weapon *n* — оружие

to meet the demands, the requirements — удовлетворять требованиям

in order to — для того чтобы

power plant — силовая установка, электростанция

Text 10A

Прочитайте текст и найдите абзацы, где говорится о применении лазеров. Переведите.

Laser

In the «War of Worlds» written before the turn of the last century H. Wells told a fantastic story of how Martians almost invaded our Earth. Their weapon was a mysterious «sword of heat». Today Wells' sword of heat has come to reality in the laser. The name stands for light amplification by stimulated emission of radiation.

Laser, one of the most sophisticated inventions of man, produces an intensive beam of light of a very pure single colour. It represents the fulfilment of one of the mankind's oldest dreams of technology to provide¹ a light beam intensive enough to vaporize the hardest and most heat-resistant materials. It can indeed make lead run like water, or, when focused, it can vaporize any substance on the earth. There is no material unamenable² to laser treatment and laser will become one of the main technological tools quite soon.

The applications of laser in industry and science are so many and so varied as to suggest magic³. Scientists in many countries are working at a very interesting problem: combining the two big technological discoveries of the second half of the 20th century — laser and thermonuclear reaction — to produce a practically limitless source of energy. Physicists of this country have developed large laser installations to conduct physical experiments in heating thermonuclear fuel with laser beams. There also exists an idea to use laser for solving the problem of controlled thermonuclear reaction. The laser beam must heat the fuel to the required temperature so quickly that the plasma does not have time to disintegrate. According to current estimates, the duration of the pulse has to be approximately a billionth of a second. The light capacity of this pulse would be dozens of times greater than the capacity of all the world's power plants. To meet such demands in practice, scientists and engineers must work hard as it is clear that a lot of difficulties are to be encountered on route⁴.

The laser's most important potential may be its use in communications. The intensity of a laser can be rapidly changed to encode very complex signals. In principle, one laser beam, vibrating a billion times faster than ordinary radio waves, could carry the radio, TV and telephone messages of the world simultaneously. In just a

fraction of a second, for example, one laser beam could transmit the entire text of the Encyclopaedia Britannica.

Besides, there are projects to use lasers for long distance communication and for transmission of energy to space stations, to the surface of the Moon or to planets in the Solar system. Projects have also been suggested to place lasers aboard Earth satellites nearer to the Sun in order to transform the solar radiation into laser beams, with this transformed energy subsequently transmitted to the Earth or to other space bodies. These projects have not yet been put into effect⁵, because of the great technological difficulties to be overcome and, therefore, the great cost involved. But there is no doubt that in time⁶ these projects will be realized and the laser beam will begin operating in outer space as well.

Notes to the Text

1. to provide — получать
2. unamenable — неподдающийся
3. as to suggest magic — можно принять за чудо
4. on route — на пути
5. put into effect — осуществлять
6. in time — со временем

УПРАЖНЕНИЯ

Упражнение 8. Просмотрите текст 10А и ответьте на вопросы.

What is this text about? 2. What does the word «laser» mean? 3. What is the laser, is it a device or some phenomenon? 4. Who was the first to write about lasers? 5. What writer from this country wrote a book about a laser? 6. What can a laser do? 7. Where can it be used? 8. What other uses do you know?

Упражнение 9. Укажите, какие утверждения соответствуют содержанию текста 10А. Исправьте неправильные утверждения.

1. Laser means «light amplification by stimulated emission of radiation». 2. Laser produces an intensive beam of light. 3. In the next few years laser will become one of the main technological tools. 4. Martians almost invaded the Earth before the turn of the last century. 5. Laser and thermonuclear reaction can produce a limited source of energy. 6. The laser beam heats the fuel so quickly that the plasma disintegrates. 7. There are projects to transform lu-

nar radiation into beams. 8. The laser beam will begin operating in outer space.

Упражнение 10. Найдите в тексте 10А инфинитивы в функции части сказуемого и обстоятельства цели (см. 3-й и 5-й абзацы).

Упражнение 11. Найдите предложения с инфинитивом в функции определения и дополнения, переведите.

1. To design, construct and operate a laser system is a great technological achievement. 2. To protect the water resources, forests and atmosphere, several laws were passed in Russia in the 1970s. 3. A very interesting problem is to produce a practically limitless source of energy. 4. There are projects to use lasers for long distance communication. 5. Automation makes it possible to obtain and develop new sources of energy. 6. To combine laser and thermonuclear reaction is a very interesting problem for the scientists in many countries. 7. To conduct physical experiments with laser beams, Russian physicists have developed large laser installations. 8. Some Western experts consider that it is practically impossible to protect big cities from pollution. 9. Lasers to be placed on Earth satellites will transform solar radiation into laser beams. 10. A special design bureau in St. Petersburg was the first in the world to develop production of superlong escalators. 11. To put some projects with lasers in operation, great technological difficulties must be overcome. 12. One of the ways to make planes as economical as possible is to lighten the aircraft by using new composite materials. 13. Signals to be measured must be strong enough.

Упражнение 12. Определите, чем выражено определение, переведите.

1. The new system developed increased the safety and efficiency of a car. 2. The laser's most important potential use may be its long distance communication applications. 3. Provided the problems of using laser for controlled thermonuclear reaction were solved, the capacity of the pulse received would be much greater than that of all the world's power plants. 4. All a pilot needs to do is to tune to radio transmitters and he will get direction signals he needs. 5. One of the problems scientists are working at is to transmit energy to space stations by using lasers. 6. Laser provides a light beam intensive enough to vaporize the hardest and most heat-resistant materials. 7. A hypersonic aircraft will require complicated cooling measures because of the extreme temperatures involved. 8. A new electronic device to be installed in the car's panel will cal-

culate how far one can drive on the fuel left. 9. The hardest materials a laser beam is aimed at vaporize within a fraction of a second. 10. Aircraft designers are interested in all kinds of new materials that are strong enough to be used for high-speed airliners. 11. Noise and vibration are also the problems to be faced by designers of hypersonic crafts. 12. Besides, there is one more problem to be studied — that of surface cooling. 13. The ordinary aircraft windows would make the future superliner structure too weak to withstand great stresses developed. 14. Every student of Cambridge is to go to his tutor once a week to discuss with him the work done.

УПРАЖНЕНИЯ ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ

Упражнение 13. Определите части речи по суффиксам и префиксам.

encode, capacity, disintegrate, emission, widen, intensive, incredible, defence, stranger, reality, strengthen, fulfilment, indestructible, amplification, substance, entirely, vaporize.

Упражнение 14. Назовите производные от следующих слов, переведите.

limit, transmit, approximate, success, science, relate.

Упражнение 15. Найдите русскому слову соответствующее английское.

устанавливать — installment, installation, install;
различие, разница — differ, difference, different;
распадаться — disintegrator, disintegration, disintegrate;
применимый — application, applicable, apply;
укреплять — strong, strength, strengthen;
эффективно — efficient, efficiency, efficiently;
усилитель — amplification, amplifier, amplify.

Упражнение 16. Найдите:

а) синонимы

rapidly, sophisticated, to conduct, demand, almost, quickly, to carry out, approximately, opportunity, requirement, also, use, to fulfill, complex, as well, to realize, application, possibility;

б) антонимы

further, integrate, cooling, outside, powerless, uncontrolled, limited, disintegrate, nearer, capable, limitless, controlled, incapable, powerful, heating, inside.

Упражнение 17. Переведите предложения, обращая внимание на многозначность слов *make* и *light*.

What makes a soap bubble (мыльный пузырь) rise and fall. If a soap bubble does not break at once, it will begin to fall. Why? To explain this, we must remember a balloon which is filled with hot air. It rises for some time and then it falls again. A balloon rises because the hot air inside it is lighter than the air round it, and as it is lighter, it must rise. When the air inside a balloon cools, the weight of the balloon itself makes it fall. A soap bubble is really a little balloon filled with hot air. This air is much lighter than the air outside. It can carry the weight of the water which makes the skin of the soap bubble. But this cannot last for a long time, because the skin of the soap bubble is very thin. The bubble becomes as cool as the air around it and it begins to fall. It is interesting to know that the early experiments with balloons were based on soap bubbles.

Упражнение 18. Переведите.

There is a large garage on Seventh Street that provides work for eleven men. There is one man who meets the customers. There are two other men who take care of batteries. There is another man who washes cars. There are three other men who sell gas and oil. There is another man who repairs timers. There are two men who work with engines and there is one man who sells tires. There is no better place for automobile service.

Упражнение 19. Заполните пропуски соответствующей формой глагола *to be*.

I ... now in the garage on Seventh Street. There ... three cars here. One ... a Ford. There ... a man in it. He ... buying a tire. One car ... a Buick. There ... five people in it. There ... a third car. A man and his wife ... in it. Their battery ... dead. The two battery men ... looking at it. «I ... sure you will have to rent a battery», one man says. «We ... a long way from home», the man in the car answers. «We not here often. We must buy a battery. There ... nothing else to do».

Упражнение 20. Дайте недостающие формы глаголов, запомните их.

chosen, fed, costing, put, overcome, coming, made.

Упражнение 21. Прочитайте и переведите без словаря.

To understand why light from the laser is so concentrated, you must know that light travels in waves. Ordinary white light is made up of many wavelengths travelling in every direction. Laser light is essentially of one wavelength, with all the waves moving in one direction. Because the laser wavelengths intensify each other, they can remain in an unbelievably straight beam for a long distance. Almost any substance can be forced to «lase» if you work hard enough with it. Gas lasers give off continuous beams of light. Tiny semiconductor lasers may be especially useful in computers for transmitting signals to replace the use of cables. Many lasers can give off invisible radiation, either infrared or ultraviolet.

CONVERSATION

Exercise 1. Answer the questions.

1. What is a laser? (a device producing an intensive beam of light) 2. What is its principle of operation? (light amplification by stimulated emission of radiation) 3. What light is produced by a laser? (light of pure single colour) 4. What can be done by means of a laser? (vaporizing the hardest materials) 5. What materials can be treated with a laser? (practically any material and any substance) 6. What is the most promising use of lasers? (the use in all kinds of communication) 7. What prevents putting into effect the projects to use lasers more widely in space? (great technological difficulties and great cost involved)

Exercise 2. Make a sentence out of the two parts.

1. A laser can find	1. must heat the fuel to the required temperature very quickly.
2. It is very interesting to combine	2. very wide application.
3. There is an idea	3. hard to overcome numerous technological difficulties.
4. In this case a laser beam	4. is not an easy task.
5. The light capacity in a laser installation should be dozens of times greater	5. to use a laser for solving the problem of controlled thermonuclear reaction.
6. To develop such a laser system in practice	6. laser and thermonuclear reaction to produce a limitless source of energy.
7. Scientists and engineers must work	7. than the capacity of all the world's power plants.

Exercise 3. A. Read and learn.

I Want to Read Faster

- Mary: I've read a detective story. It wasn't very good so I wasted (тратить, терять время) much time.
- Jane: Oh, it takes me now not more than an hour to read a novel.
- M.: Really?
- J.: Two months ago it would have taken me about two days. It is a pity you didn't join me when I was taking speed-reading course.
- M.: Two things hold me back. Doubts that any system could radically and permanently increase my speed. And money for the courses.
- J.: But I thought that if I could double my speed, the sum wouldn't be so much.
- M.: Sure, you are right. By the way, some authorities say it isn't reading. Though a lot of unread newspapers, books and magazines about the house might fall on me. My present work day reading is 200 words per minute, it is very slow. How are those speed reading courses?
- J.: Great, today 50,000 students a year take these courses.
- M.: How long does this course last?
- J.: Eight weeks, a 2,5 hour session a week plus an hour a day drill.
- M.: What is your speed now?
- J.: The final test showed that my speed was 1520 w.p.m. The book was the same we have used for our entrance exam.
- M.: But you can lose the technique.
- J.: It is another question. The only wide survey (опрос) of ex-students — 1800 of them — showed that after a year one third of the people weren't using the method at all. Another third said they use it sometimes and that probably they have kept speed. But the rest of the students said they were reading faster than a year later.

B. Answer the following questions:

1. Are you a fast or a slow reader?
2. In what situations can fast reading be useful in your opinion?
3. Would you like to improve your reading speed? Why?
4. Can all books be read quickly? Why (not)?

Exercise 4. Comment on the following statement.

Every student ought to be able to read very fast.

One point of view : Reading requires thought; one needs time for thinking, reading ought to be a kind of dialogue with the author — this requires time; quality is more important than quantity.

A contrary point of view : Fast reading does not mean careless reading, nothing is left out, thinking can be very fast, fast reading is reading for meaning, it saves time (экономить) also for thinking, it is very important for a person to get a great deal of information in as little time as possible.

Exercise 5. Conduct a scientific meeting on: «Laser and its applications».

Use texts 10A, 10B, and 10C as a basis for the preparation of an oral talk (устное сообщение), short abstracts (краткие тезисы), summary (реферат) of the presentation and for the discussion of the theme (тема).

Useful Words and Phrases of Scientific Communication at a scientific meeting, conference, round-table discussion, symposium, colloquium, seminar, session, congress, etc.

Stages of a meeting	Phrases
<i>Chairman</i>	
Opening a meeting	I declare the meeting open. Right, can we start? Ladies and Gentlemen, are we ready to begin? OK then, perhaps we could make a start?
Introducing a speaker	I have a great pleasure to introduce Dr. (Prof.) Baker, an expert in ... Our first speaker, Dr Baker, will speak on...
Interrupting a speaker	May I draw your attention to the fact that this point will be discussed later?
Opening a discussion	And now I'd like to open the discussion on the presentation given by Dr Baker. Are there any questions to Dr Baker?
Ending a discussion	May I propose that we stop there?
Thanking	I'm sure I'm speaking for everyone when I say how grateful we are to Dr Baker for his informative (excellent) presentation, (talk, speech, lecture). I'd like to thank everybody here.
Ending a meeting	I declare the meeting closed.
<i>Speaker</i>	
Introducing the report	Mr. Chairman, Ladies and Gentlemen, it is a great honour to address this meeting (conference); I'd like to talk in my report about ... First of all (in the first place) I'd like to name the main points of my paper.

While reporting	Now, let us turn to the point ... The second point is ... Moving to point three ...And finally ... So much about ... I'd like to attract your attention to ... Allow me to call your attention to ... I should like to note (emphasize) ... If you look at this diagram ... Have a look at ... If you remember, I mentioned ... As I've already mentioned ... Do you see what I mean ... Do you follow me... As far as I know ... Sorry, I got lost ...
Ending the report	In conclusion I'd like to stress the importance ... Thank you for your attention.
<i>Audience</i>	
Introducing oneself	My name is John Smith. I am from Massachusetts Institute of Technology. I'm very impressed with Dr. B's complete (interesting) presentation. I'd like to give you my view on this subject ...
Questions	My question is as follows ... I have a question to ask ... One question is, the second question is ... I'd like to ask a question in this connection... There is a practical question which ... I'd like to ask a question concerning ... May I address a question to Dr. B.? Is it possible to describe simply, how...
Agreement with the speaker	I think you are entirely right speaking about... I'd like to express agreement with the speaker
Disagreement	But I am not sure you are right. I am very sorry to have to say that I don't agree with Dr. B. Unfortunately, I cannot agree with your final statement. I wish I could agree with you but... We are not yet certain....

Making remarks	This is an interesting work but it has a lack... It is surprising... It is unbelievable... I'm not surprised that it is possible... I find it hard to believe... I'd like to make a comment of general nature... I'd like to make two more remarks... I have a few points to make... I have just a small point, but it may make things much clearer a bit. Excuse me, but I'd just like to point out...
Making contribution to the discussion	I'd like to add in connection with... In addition, I'd like to mention... Let me put some more questions...

Exercise 6. Read and smile.**A Story Too Terrible To Tell**

Three men came to New York for the first time. They took a room in a hotel. In the evening they went sight-seeing and did not come back till nearly three in the morning. The room they had taken was on the 43rd floor. «I am sorry, gentlemen», said the porter, «but the elevator does not work, there is something wrong with it. You will have to walk up to your room». This was too bad, but the men agreed to tell stories on the way up in order to kill the time.

By the time the first one had told his story, they had climbed up to the 11th floor. The next story kept them amused till they had reached the 31st floor. At last it was time for the third man to tell his story, but he refused. He said the story he had in mind was too terrible, he simply couldn't tell it. They continued climbing and all the time the two asked him to begin. At last they stopped and refused to go on unless he told them his terrible story. «The story I have to tell you is a short one», he said at last, «we have left the key to our room downstairs with the porter».

Text 10B

Прочитайте текст и найдите информацию о преимуществах применения оптических волокон в технике связи; о том, что послужило основой разработки систем оптической связи, а также о практическом применении оптической технологии. Соотнесите отмеченные в тексте факты со следующими датами: 1960, 1970, 1982 гг. Изложите эту информацию по-английски.

Optical Technology

One of the most interesting developments in telecommunication is the rapid progress of optical communication where optical

fibers are replacing conventional telephone wires and cables. Just as digital technologies greatly improved the telephone system, optical communication promises a considerable increase in capacity, quality, performance and reliability of the global telecommunication network. New technologies such as optical fibers will increase the speed of telecommunication and provide new, specialized information service. Voice, computer data, even video images, will be increasingly integrated into a single digital communication network capable of processing and transmitting virtually any kind of information.

It is a result of combining two technologies: the laser, first demonstrated in 1960, and the fabrication 10 years later of ultra-thin silicon fibres which can serve as lightwave conductors. With the further development of very efficient lasers plus continually improved techniques to produce thin silica fibres of incredible transparency, optical systems can transmit pulses of light as far as 135 kilometers without the need for amplification or regeneration.

At present high-capacity optical transmission systems are being installed between many major US cities at a rapid rate. The system most widely used now operates at 147 megabits (thousand bits) per second and accommodates 6,000 circuits over a single pair of glass fibres (one for each direction of transmission). This system will soon be improved to operate at 1.7 gigabits (thousand million bits) per second and handle 24,000 telephone channels simultaneously.

A revolution in information storage is underway with optical disk technology.

The first digital optical disks were produced in 1982 as compact disks for music. They were further developed as a storage medium for computers. The disks are made of plastics coated with aluminium. The information is recorded by using a powerful laser to imprint bubbles on the surface of the disk. A less powerful laser reads back the pictures, sound or information. An optical disk is almost indestructible and can store about 1000 times more information than a plastic disk of the same size.

One CD-ROM disk (650 MB) can replace 300,000 pages of text (about 500 floppies), which represents a lot of savings in databases.

The future of optical storage is called DVD (digital versatile disk). A DVD-ROM can hold up to 17 GB, about 25 times an ordinary CD-ROM. For this reason, it can store a large amount of multimedia software and complete full-screen Hollywood movies in different languages. However, DVD-ROMs are «read-only» devices. To avoid this limitation, companies also produce DVD rewritable drives.

Besides, it is reported that an optical equivalent of a transistor has been produced and intensive research on optical electronic computers is underway at a number of US companies as well as in countries around the world.

It is found that optical technology is cost-effective and versatile. It finds new applications every day — from connecting communication equipment or computers within the same building or room to long-distance transcontinental, transoceanic and space communications.

Text 10C

Прочитайте текст и расскажите о практическом применении лазеров.

An Encyclopedia on a Tiny Crystal

Scientists have discovered that a laser beam can be effectively used to record alphanumeric data and sound on crystals. According to Russian researchers a method for recording information on crystals by means of a laser has already been developed, but advanced technologies are needed to make it commercially applicable.

At present researchers are looking for the most suitable chemical compounds to be used as data storages and trying to determine optimum recording conditions. Theoretically, the entire «Great Soviet Encyclopedia» can be recorded on a single tiny crystal.

As far back as 1845, Michael Faraday discovered that a light beam reverses its polarization as it passes through a magnetized crystal. Scientists of our day have used this phenomenon to identify crystalline materials capable of storing information. Lasers have been successfully employed to record information on and read it off.

No ideal data storage crystal has yet been found, but it is obvious now that the future of computer engineering lies in lasers and optoelectronics.

Text 10D

Прочитайте текст и найдите примеры все возрастающей тенденции к более тесному международному сотрудничеству. Почему такое сотрудничество необходимо? Назовите страны-участницы такого сотрудничества. Запомните произношение названий стран.

Science and International Cooperation

One of the most striking features of modern science is the increasing tendency towards closer cooperation between scientists and scientific organizations (institutions) all over the world. In

fact, it is becoming more and more evident that many of the problems that affect the world today cannot be solved without joining scientific efforts and material resources on a world-wide scale. The exploration of space, world finance, global environment protection problems and the development of new sources of power are the examples of areas of scientific research which are so costly and complicated that it is difficult for a single country to solve them efficiently and in a short period of time. The renewal of international scientific cooperation was demonstrated in the sharing of data which were obtained by Russian, Japanese and European space probes in 1986 on Halley's comet.

Many countries were successfully cooperating on a programme called Intercosmos in launching a large number of vertical geophysical rockets and satellites. Space exploration programmes were being conducted between Russia and Austria, India, France, Sweden and other countries. Joint manned flights by Russian and foreign cosmonauts included citizens from numerous countries. Many international crews have worked on orbit and carried out a lot of scientific experiments.

Russian and the U.S. engineers are now working side by side on the International Space Station, the largest peacetime engineering project in history.

Launched from opposite sides of the world, the first International Space Station components Zarya and Unity have begun a new era of exploration as 16 nations joined their scientific and technological resources in the first truly international space program to improve life on Earth. Even before its launch, the International Space Station has opened new spheres of research on Earth by overcoming barriers of language, culture and technological differences worldwide.

Indeed, it represents unprecedented (беспрецедентный, беспримерный) global cooperation and trust. There is no doubt that it is the first step towards a unified «planetary civilization» that will explore space as citizens of Earth, not of individual nations.

ДОПОЛНИТЕЛЬНЫЕ ЗАДАНИЯ

Упражнение 1. А. Прочитайте словосочетания из текста 10А и постарайтесь понять значения выделенных слов.

1. time to **disintegrate**
2. the **duration** of the pulse
3. to be **encountered**
4. in **just** a fraction of a second

В. Подберите к каждому выделенному в А слову соответствующее ему по значению.

- a. to meet unexpectedly
- b. only, merely
- c. break up into small parts
- d. time during which smth lasts or exists

Упражнение 2. А. Прочитайте текст и постарайтесь понять значение словосочетания *off-the-shelf item*. Дайте определение или объяснение этому термину.

Laser Propulsion

Another approach is to absorb laser light in a plasma «flame» sustained by laser light focused in the center of a flowing stream of propellant gas. Thrust levels as high as 10,000 N with a specific impulse (удельный импульс) of 1,000 sec appear achievable using hydrogen as the propellant gas. Laser power as low as 1 MW would be useful for low Earth orbit launching without relay optics. 10–100 MW lasers can launch small payloads from the ground. With up to 100 launches a day, a 20 MW launcher weighing 20 kg could place several hundred tons in orbit per year. Low-gigawatt lasers could launch multi-ton spacecraft with the same ease that present multi-gigawatt chemical rockets do. Laser rockets will have much better payload fraction since the heavy power plant is left on the ground and the higher specific impulse results in lower propellant fraction. Although gigawatt lasers are not off-the-shelf items, there is no doubt they could be built if the need were strong enough.

В. Выберите соответствующие контексту А значения выделенных слов.

approach

- a. coming near to
- b. approximation, a way to solve a problem
- c. way, path, road

sustain

- a. enable to keep up, maintain
- b. suffer, undergo
- c. keep from falling

relay

- a. supply of fresh horses to take the place of tired ones
- b. device which receives signals and transmits them with greater strength, thus increasing the distance over which they are carried
- c. place from which radio programs are broadcast after being received from another station

payload

- a. passengers and cargo, but not fuel
- b. bomb in a missile
- c. crew and instruments of a spaceship

item

- a. each single thing, part or object in a list
- b. detail or paragraph (of news)
- c. number of a program

off-the-shelf

- a. commercially available
- b. ready to use
- c. possible or likely

Упражнение 3. Заполните пропуски словами.

A.

capacity	as well	laser	information	light	existing	advantage	space
doubt	amplified	cost	conventional				

Optical fibres are made of glass and use (1) ... (usually from a (2) ...) to transmit messages. There is no (3) ... optical fibre systems have enormous (4) ... over (5) ... transmission systems. They have a much higher (6) ... than copper wires, can carry much more (7) ... and have a potentially lower material (8) ... Besides, optical fibres occupy far less (9) ... The quality of transmission is high (10) ... The signal does not need to be (11) ... as often as with (12) ... cables. Optical fibres do not suffer from interference.

B.

heat	treatment	distance	melt	identify	beams	vaporize	displays
light	communication						

Nowadays, lasers are used to (1) ... targets in military uses. In engineering, powerful laser (2) ... can be focused on a small area. They can (3) ..., (4) ..., or (5) ... material in a very precise way. Lasers are ideal for (6) ... in space. Laser light can travel long (7) ... without losing signal strength. In medicine, laser beams can be used for the (8) ... of damaged tissue (ткань) in a fraction of a second without causing harm (вреда) to healthy tissue. In the arts, lasers can provide fantastic displays of (9) ... Pop concerts are often accompanied by laser (10) ...

Упражнение 4. Составьте возможные словосочетания глаголов из колонки А и существительных из колонки В.

A	B
1. come to	a. information, data, sound
2. overcome / encounter	b. into orbit
3. record / store / carry	c. a project
4. realize	d. reality
5. place	e. difficulties, differences

Упражнение 5. Заполните таблицу на словообразование.

Verb	Noun	Adjective
identify	...	...
...	...	vaporous
amplify	...	—
...	idealization	...
...	...	strong
...	variety	...
...	...	limitless
—	precision	...
treat	...	—

Упражнение 6. А. Назовите 15–20 ключевых слов и словосочетаний на тему: «Laser applications».

В. Speak about:
Laser as a means of propulsion.

LESSON 11

Сложное подлежащее и сложное дополнение
Значение слов *either*, *neither* и их сочетаний

Text 11A. *Superconductivity*

Text 11B.

Text 11C. *New Hope for Energy*

Text 11D. *Massachusetts Institute of Technology*

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

Упражнение 1. Переведите предложения со сложным дополнением.

1. We know Morse to have been a painter by profession. 2. Scientists expect lasers to solve the problem of controlled thermonuclear reaction. 3. M. Faraday supposed a beam of light to reverse its polarization as it passed through a magnetized crystal. 4. Designers expect dirigibles to be used for exploration of new territories. 5. Japanese designers believe a new ceramic engine to replace the conventional one. 6 Engineers suppose a new «night vision» system to enable drivers to see better after dark. 7. Scientists believe new laser devices to be widely used in medicine. 8. We know the first digital optical disks to have been produced as disks for music. 9. They believed him to be capable.

Упражнение 2. Найдите инфинитив в предложениях, переведите.

A. 1. Hundreds of radio navigation stations watch the airplanes find their destination and land safely. 2. Twice a year people see birds fly south and north, but we don't know how they find their way. 3. At the Paris Exhibition people watched the cargo airplane «Ruslan» carry a great amount of cargo. 4. When you stand near a working engine you feel it vibrate. 5. Making experiments with electric telegraph Morse noticed a pencil make a wavy line when

connected to an electric wire. 6. Nowadays people watch on television cosmonauts work in space, «Lunokhod» move on the surface of the Moon and Olympic games take place on the other side of the globe.

B. 1. A force applied to a body causes it to move in a straight line. 2. The unsatisfactory results of Bell's experiments forced him to change the method of testing. 3. The excellent properties of Damascus steel made metallurgists of the whole world look for the lost secret of the steel. 4. Very high temperatures often cause certain materials to break. 5. Bad weather conditions make pilots switch over to automatic control.

Упражнение 3. Обратите внимание на инфинитивный оборот, состоящий из предлога *for*, дополнения и инфинитива.

1. It was the only thing for us to do. 2. The students were waiting for the lecturer to describe the properties of a new composite material. 3. It is for you to decide which of the two methods to use. 4. It is necessary for the students to know the properties of various alloys. 5. A system of satellites is provided for people to watch the central TV program.

Упражнение 4. Переведите предложения со сложным подлежащим.

A. 1. Students of Cambridge are supposed to wear gowns at lectures. 2. The first pocket-size colour television sets were reported to have been developed. 3. Today's aircraft is expected to be replaced by a new model of hypersonic aircraft in a few years. 4. Intensive research on optical-electronic computer is said to be going on in a number of US companies. 5. A method for recording information on crystal by means of a laser is known to have been developed by a Russian researcher. 6. The annual output of personal computers is expected to reach millions in the near future. 7. The laser is known to be a device producing an intensive beam of light by amplifying radiation. 8. Optical technology has been found to be cost-effective. 9. The optical equivalent of a transistor is reported to have been produced.

B. 1. Our present-day life seems to be quite impossible without telephone, radio, and television. 2. Nowadays the principle of radio operation seems to be quite simple. 3. The term «radar» is known to be composed of the first letters of «radio, detection and ranging». It happens to reflect its basic principle, that is, the location of an object at a distance. 4. About 50 per cent of Lake Baikal water proved to have been polluted since the Baikal plant has begun its work.

5. Lasers appeared to be highly useful for solving the problem of controlled thermonuclear reaction and communication. 6. A system of Earth satellites appears to have solved the problem of transmitting the central TV program to any part of the world. 7. Electricity proved to be able to travel instantly over a long piece of wire.

C. 1. Dirigibles are likely to be used for taking tourists to distant and beautiful places. 2. Lasers are unlikely to be used in our everyday life soon. 3. Superconductivity is certain to bring about new discoveries in science and technology.

Упражнение 5. Прочитайте, запомните выделенные слова.

- A.: Do you know what the words **either** and **neither** mean?
B.: Yes, I do. **Either** means **каждый, любой, любой из двух**, while **neither** stands for **ни один, ни один (из)**.
A.: That's correct. Can you give examples?
B.: Yes I can. For example: There is a number of lecture rooms on **either** side of the corridor. Which of these dictionaries can be used for translating a technical article? You may use **either**.
A.: And in what way is **either** translated when it is used with **or**? For instance: «Please, bring some dictionaries **either** from the library **or** from the reading room.»
B.: **Either ... or...** means **либо ... либо, или ... или**.
A.: Now let us speak about **neither**, it is the negative form of **either**, meaning **ни тот ... ни другой**. For instance: I was offered two books, but I took **neither** of them, as I did not like them.
B.: And **neither** connected with **nor** means **ни ... ни**, for example: These problems seemed difficult **neither** to my friend, **nor** to me.
A.: Are these words used in any other way?
B.: Yes, they may be used in short negative sentences such as: «I don't like this book», said Peter. «**Neither** do I», said Ann, which means **мне тоже (не нравится)**. I shall not go to the library tomorrow. He won't go **either**. Он **тоже (не пойдет)**.

Упражнение 6. Переведите, обращая внимание на разные значения слов *more* и *much*.

1. One more present-day complicated problem to be solved is that of combining laser and thermonuclear reaction to produce a practically limitless source of energy. 2. A Japanese company is planning to install several more electronic devices on the car instrument panel. 3. The Voice Warning System is one more electronic device. 4. If you make half-hour breaks while getting ready for your exams, your brain will work much more efficiently.

5. Aerodynamics is one more problem to be taken into consideration when designing a hypersonic craft. 6. The wheel-computerized system is much more efficient than those used previously. 7. Cryogenic fuels used both as coolant and propellant make the solution of the superliner surface cooling problem much easier to solve. 8. The fact that dirigibles are much larger in size and their staying power is much longer than those of an aircraft makes them ideally suited for exploration.

Упражнение 7. Найдите русские эквиваленты для словосочетаний.

the physics discoveries, discoveries that led to, the scientific advantage, advantage could well come to nation, to bring the mankind to, mercury wire, unexpected phenomenon, to return to normal state, by passing electric current, by applying magnetic field, to make a great contribution, they introduced a model, a model proved to be useful, a theory won for them the Nobel Prize, research in superconductivity, research became especially active, the achieved record of 23 K.

исследования особенно активизировались; исследования в области сверхпроводимости; теория, за которую они получили Нобелевскую премию; привести человечество к ...; преимущество в науке; открытия в области физики; достигнутая рекордная отметка в 23 К; открытия, которые привели к...; преимущество могла бы получить нация (страна); ртутная проволока; вернуться в обычное состояние; пропуская электрический ток; внести большой вклад; неожиданное явление; они предложили (ввели) модель; прикладывая магнитное поле; модель оказалась эффективной.

Упражнение 8. Прочитайте и переведите интернациональные слова.

prestige [pres'ti:ʒ], nation ['neiʃən], Nobel prize [nəu'bel praɪz], absolute zero ['æbsəlu:t 'ziərəu], phenomenon [fɪ'nɒmɪnən], normal, magnetic, electromagnetic, theory ['θiəri], theorists ['θiəristz], fundamental theory, physics, physicist, model ['mɒdl], metallic [mɪ'tælɪk], ceramic [sɪ'ræmɪk], colleagues ['kɒli:gz], laboratory, critical temperature, fabricate, extremely [ɪks'tri:mli], process ['prəuses].

Упражнение 9. Прочитайте и запомните произношение слов:

latest ['leɪtɪst], spectacular [spek'tækjʊlə], breakthrough ['breɪk'θru:], compare [kəm'pæə], award [ə'wɔ:d], research

[rɪ'sə:tʃ], mercury ['mɜ:kjʊrɪ], wire ['waɪə], below [bɪləʊ], 5 °C ['faɪv dɪ'gri:z 'sentɪgreɪd], completely [kəm'pli:tli], return [rɪ'tə:n], either ['aɪðə], finally ['faɪnəli], Zurich ['zjuərɪk], previously ['pri:vjəsli], throughout [θru:'aʊt], liquid ['lɪkwɪd], nitrogen ['naɪtrədʒən], lose [lu:z], moreover [mɔ:'rəʊvə], lack [læk].

СЛОВА И СЛОВСОЧЕТАНИЯ ДЛЯ ЗАПОМИНАНИЯ

achievement *n* — достижение

below *adv* — ниже, внизу

benefit *n* — выгода, польза

boil *v* — кипеть

continue *v* — продолжать

cool *v* — охлаждать

current *n* — электрический ток

discover *v* — открывать, обнаруживать

finally *adv* — наконец

introduce *v* — вводить

lack *v* — нуждаться

likely *adv* — вероятно

lose *v* — терять

master *v* — овладевать

moreover *adv* — более того

pass *v* — пропускать

present *v* — представлять

previously *adv* — ранее, предварительно

prominent *a* — выдающийся, известный

random *a* — беспорядочный, случайный

resistivity *n* — удельное сопротивление

return *v* — возвращаться

satisfactory *a* — приемлемый, удовлетворительный

suddenly *adv* — вдруг, внезапно

sufficiently *adv* — достаточно

tend *v* — стремиться, иметь тенденцию

wire *n* — провод

at once — сразу, немедленно

Text 11A

Прочитайте текст. Расскажите об основных этапах развития сверхпроводимости и о тех ученых, которые внесли свой вклад в исследование сверхпроводимости.

Superconductivity

According to the prominent scientist in this country V.L. Ginzburg the latest world achievements in the field of superconductivity mean a revolution in technology and industry. Recent spectacular breakthroughs¹ in superconductors may be compared with the physics discoveries that led to electronics and nuclear power. They

are likely to bring the mankind to the threshold of a new technological age. Prestige, economic and military benefits could well come to the nation that first will master this new field of physics. Superconductors were once thought to be physically impossible. But in 1911 superconductivity was discovered by a Dutch physicist K. Onnes, who was awarded the Nobel Prize in 1913 for his low-temperature research. He found the electrical resistivity of a mercury wire to disappear suddenly when cooled below a temperature of 4 Kelvin ($-269\text{ }^{\circ}\text{C}$). Absolute zero is known to be 0 K. This discovery was a completely unexpected phenomenon. He also discovered that a superconducting material can be returned to the normal state either by passing a sufficiently large current through it or by applying a sufficiently strong magnetic field to it. But at that time there was no theory to explain this.

For almost 50 years after K. Onnes' discovery theorists were unable to develop a fundamental theory of superconductivity. In 1950 physicists Landau and Ginzburg made a great contribution to the development of superconductivity theory. They introduced a model which proved to be useful in understanding electromagnetic properties of superconductors. Finally, in 1957 a satisfactory theory was presented by American physicists, which won for them in 1972 the Nobel Prize in physics. Research in superconductors became especially active since a discovery made in 1986 by IBM² scientists in Zurich. They found a metallic ceramic compound to become a superconductor at a temperature well above³ the previously achieved record of 23 K.

It was difficult to believe it. However, in 1987 American physicist Paul Chu informed about a much more sensational discovery: he and his colleagues produced superconductivity at an unbelievable before temperature 98 K in a special ceramic material. At once in all leading laboratories throughout the world superconductors of critical temperature 100 K and higher (that is, above the boiling temperature of liquid nitrogen) were obtained. Thus, potential technical uses of high temperature superconductivity seemed to be possible and practical. Scientists have found a ceramic material that works at room temperature. But getting superconductors from the laboratory into production will be no easy task. While the new superconductors are easily made, their quality is often uneven. Some tend to break when produced, others lose their superconductivity within minutes or hours. All are extremely difficult to fabricate into wires. Moreover, scientists lack a full understanding of how ceramics become superconductors. This fact makes develop-

ing new substances largely a random process. This is likely to continue until theorists give a fuller explanation of how superconductivity is produced in new materials.

Notes to the Text

1. spectacular breakthroughs — захватывающие открытия, достижения (переворот)
2. IBM — компания Ай Би Эм
3. well above — намного выше

УПРАЖНЕНИЯ

Упражнение 10. Просмотрите текст 11А и ответьте на вопросы.

1. What is this text about?
2. What is the phenomenon of superconductivity?
3. Who was the first to discover the phenomenon?
4. What scientists do you know who have worked in the field of superconductivity?
5. What materials are the best superconductors?
6. Is it possible to return superconducting materials to the normal state?
7. How can it be done?
8. In what fields of science and technology can the phenomenon of superconductivity be used?

Упражнение 11. Укажите, какие утверждения соответствуют содержанию текста 11А. Исправьте неправильные утверждения.

1. The latest achievements in superconductivity mean a revolution in technology and industry.
2. Superconductors were once thought to be physically impossible.
3. The achievements in superconductivity cannot be compared with the discoveries that led to electronics and nuclear power.
4. The electrical resistivity of a mercury wire disappears when cooled below 4 K.
5. A superconducting material cannot be returned to the normal state.
6. Landau and Ginzburg introduced a model which was useful in understanding electromagnetic properties of superconductors.
7. Scientists from IBM found a ceramic material that became a superconductor at a temperature of 23 K.
8. Potential technical uses of high temperature superconductivity are unlikely to be possible and practical.

Упражнение 12. Найдите в тексте 11А инфинитивные конструкции.

Упражнение 13. Сравните пары предложений, переведите.

1. Designers report a new manned craft to be able to submerge to the depth of 21,000 feet. A new manned craft is reported to be able to submerge to the depth of 21,000 feet.
2. We know radio navigation

stations to be located at different places around the world to guide the pilots. Radio navigation stations are known to be located all over the world to guide the pilots. 3. People considered dirigibles to be too slow and unreliable, that is why they were not used for a long time. Dirigibles were considered to be slow and unreliable. 4. Experts expect the new submersible craft to move round the ocean floor like a sports car. The new submersible craft is expected to move round the ocean floor like a sports car. 5. Scientists in many countries consider propeller engines to be much more economical. Propeller engines are considered to be much more economical. 6. We know propeller planes to fly slower than jet planes, therefore, a new ventilator engine with a propeller has been built. But as propeller planes are known to fly slower than jet planes a new ventilator engine with a propeller has been built.

Упражнение 14. Найдите предложения со сложным подлежащим, переведите.

1. The phenomenon of superconductivity appears to have been discovered as early as 1911. 2. Before 1911 superconductivity was assumed to be impossible. 3. Recent discoveries in superconductivity made scientists look for new conducting materials and for practical applications of the phenomenon. 4. The latest achievements in the field of superconductivity are certain to make a revolution in technology and industry. 5. Recommendations from physicists will allow the necessary measures to be taken to protect the air from pollution. 6. Lasers are sure to do some jobs better and at much lower cost than other devices. 7. M. Faraday supposed a light beam to reverse its polarisation as it passed through a magnetised crystal. 8. Superconductors are likely to find applications we don't even think of at present. 9. A Dutch physicist found a superconducting material to return to normal state when a strong magnetic field was applied. 10. Properties of materials obtained in space prove to be much better than those produced on Earth. 11. There are prospects for lasers to be used in long distance communication and for transmission of energy to space stations. 12. The electrical resistivity of a mercury wire was found to disappear when cooled to -269°C . 13. Additional radio transmitters let the pilot make his approach to an airport by watching his flight instruments. 14. There seems to be a lot of alloys and compounds that become superconductors under certain conditions.

УПРАЖНЕНИЯ ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ

Упражнение 15. Определите, к какой части речи относятся слова.

resistant, resist, resistance, resistor, resistivity; superconductivity, superconductive, superconductor, superconducting; theory, theorist, theoretical, theorize; physics, physicist, physical, physically; explain, explainable, explanation; store, storage, storable.

Упражнение 16. Найдите русскому слову соответствующее английское.

достижение — achievable, achievement, achieve;

электронный — electronics, electronic, electron;

легче — easily, easy, easier;

удовлетворять — satisfy, satisfactory, satisfaction;

действительно — reality, realise, really.

Упражнение 17. Переведите слова с суффиксом *-ward* (*-wards*), обозначающим направление.

toward(s), forward(s), backward(s), afterward(s), downward(s), outward(s), northward(s), southward(s), rearward(s), homeward(s), sideward(s), windward(s), upward(s).

Упражнение 18. Найдите слова с нестандартным образованием множественного числа.

There are a few words taken over from Latin and Greek that still retain their original plurals in English. In some cases we can use either. *Formula* is seen more often than *formulae*. *Antenna* — *antennae* (*pl*). Many think that *media*, *strata* and *phenomena* are all singular. They aren't. *Data*, a plural, is used both ways.

Here are some foreign singular and plural forms of words often used in English. Latin: *medium* (a means of mass communication) — *media*, *nucleus* (ядро атома) — *nuclei*; Greek: *analysis* — *analyses*; *axis* — *axes*; *crisis* — *crises*; *hypothesis* — *hypotheses*; *phenomenon* — *phenomena*.

Упражнение 19. Найдите синонимы и антонимы.

below — above; useful — useless; easy — difficult; field — sphere; to meet demands — to meet requirements (needs); full — complete; to use — to apply; to get — to obtain; moreover — besides; sufficient — enough; likely — unlikely; to continue — to discontinue; conductivity — nonconductivity; to vary — to change; to lead to — to result in; recent — latest; advantage — disadvantage;

low — high; believable — unbelievable; to lose — to find; tiny — huge; liquid — solid; unexpected — expected; common — ordinary.

Упражнение 20. Запомните выделенные слова и словосочетания.

1. The climate in this part of the world is the most suitable for people to live in. It is **neither** too hot, **nor** too cold. 2. Many lasers give off invisible radiation **either** infrared **or** ultraviolet. 3. There is the tropical zone on **either** side of the Equator. 4. It is possible to divide all countries into classes: developed and developing countries. Various criteria may be used to include a particular country in **either** of the two categories. 5. The numbers are **either** odd **or** even. 6. Such satellites can contain **either** television cameras **or** photographic equipment for transmitting pictures to Earth.

«I see you are not a scientific person, my friend».

«Why do you say that?»

«You do not take good care of your car. You have no water in your radiator».

«I thought that I had plenty of water».

«You have no oil **either**. You will ruin your car if you run it without oil».

«Have I plenty of water in the storage battery?»

«No, you haven't a drop».

«I haven't any air in my spare tire, **either**».

«Have you any extra tubes?»

«No, I haven't, but I have a good tube in the spare tire. I had four new tubes when I met a man who was having tire trouble. He hadn't an extra tube. I let him have my tubes. I suppose he was not a scientific person **either**. His car was in a worse condition than mine is.»

How Did It All Begin?

Do you ever wonder why people do or wear, or say certain things? Why do they shake hands when they meet? Many things you say and do could have reasons that date back thousands of years.

For example, it is very strange to think that shaking hands — a friendly custom (обычай) today — was originally a means of keeping a stranger's (незнакомец) weapon hand where it could do no harm.

In primitive times, man never went about without some weapon of defence — usually a club (дубинка). Upon meeting a stranger a man could **either** stand and fight **or** turn away before discovering if the stranger was a friend or an enemy, or greet the stranger and possibly become friends.

But how could he be sure the stranger would be friendly and how could the stranger trust in return? There was only one way to show friendly intentions and that was for both men to lay down their weapons and hold out empty hands. For added insurance, each would reach for the other's right hand. As long as both men's hands were safely clasped, **neither** could harm the other. Therefore, a handshake originally was a means of self-defence.

Упражнение 21. Дайте недостающие формы глаголов и запомните их.

teach, fighting, wore, frozen, letting, carried on, laid down.

Упражнение 22. Прочитайте и переведите текст без словаря.

The ancient Greeks are known to have been great watchers of the sky and also great thinkers. As they watched the sky night after night, it was natural for them to think that the Earth stood and the stars, planets, sun and moon were moving round the earth in space. They thought the sun to be between Venus and Mars. To explain the movement of the planets, however, was very difficult. Then one day a young scientist named Copernicus at Krakow University in Poland supposed that the sun and not the Earth should be the centre of everything. He was the first to explain properly our solar system. The ancient Greeks had made the mistake of thinking that because the stars and planets seemed to move as they looked at the sky, the Earth must stand. If you sat in a train and looked out at the trees, it would be easy to understand their mistake. The trees seem to be moving backwards, but really it is the train that is moving forwards.

CONVERSATION

Exercise 1. Answer the questions.

1. What field of science studies the phenomenon of superconductivity? (physics) 2. What can a nation have if it is the first to master this new field of science? (prestige, scientific advantage, economic and military benefits) 3. What is superconductivity? (the loss of electrical resistivity by a material on being cooled to temper-

atures near absolute zero) 4. What is absolute zero? (0 Kelvin or $-273\text{ }^{\circ}\text{C}$) 5. What scientists worked in the field of superconductivity research? (Dutch physicist K. Onnes, Russian physicists L. Landau and V. Ginzburg, and a number of American scientists) 6. What materials are the best super conductors? (ceramic materials) 7. What are the potential technical uses of superconductivity? (nuclear research, power generation, electronics, etc.)

Exercise 2. Make a sentence out of the two parts.

1. Recent achievements in superconductivity research are	1. fundamental theory to explain this unexpected phenomenon.
2. They may be compared with	2. found the electrical resistivity of mercury to disappear when cooled to the temperature of 4 Kelvin.
3. Superconductivity is known to	3. to the development of superconductivity theory.
4. While carrying out his low temperature research he	4. have been discovered by a Dutch physicist.
5. For 50 years after the discovery there was no	5. of great importance for science and technology.
6. In the 1950s Russian and American physicists made a great contribution	6. since the discovery of a superconductive metallic ceramics.
7. Research in the field of superconductivity became especially active	7. physics discoveries that led to the development of electronics and nuclear power.

Exercise 3. Read and learn.

Professor Brown: Hello, glad to meet you, prof. Smith, haven't seen you for ages, since I left the University.

Prof. Smith: How do you do, prof. Brown, I haven't expected to see you here. Are you interested in superconductivity problems? By the way, how are you making your living? I haven't heard anything about your work lately. I spent the last two years in Geneva as a member of a special UN committee.

Pr. B.: I am with Bell Telephone company. It is a global leader in electrical engineering. And I deal with new technologies.

- Pr. S.: Oh, your work is so important nowadays. Mankind needs energy for producing light, heat and transportation. This is the basis of our civilization.
- Pr. B.: Sure, that's so. And as the population grows, so does the demand for better quality of life. Energy consumption increases daily.
- Pr. S.: But with it the threat to clean air, pure water and soil increases too. These natural resources are not inexhaustible.
- Pr. B.: Of course. We are developing new industrial systems to improve productivity, reducing the amount of raw materials and energy required. Our new advanced systems help to conserve energy too.
- Pr. S.: In Geneva one of the problems I studied was the problem to generate, transmit and distribute energy with great efficiency. I think Doctor Carter's work in this field is the most promising. From the Agenda (повестка дня) we have all just received you can see that Dr. Carter will speak on his work tomorrow.
- Pr. B.: I have already seen this paper on the program. I won't miss (пропустить) it. Have you attended the morning session?
- Pr. S.: The most interesting was the discussion on the problems of the balance between the needs of mankind and the conservation of the natural resources.
- Pr. B.: Have you taken part in it?
- Pr. S.: Certainly. I've spoken about clean and efficient technology in the field of electrical engineering.

Exercise 4. Comment on the following statement.

The teaching routine procedures (заведенный порядок, общеизвестная и установившаяся практика) ought to be the main aim of education.

One point of view : Routine makes life and experiments easier, it saves energy; experience of past generations takes on the form of routine; routine helps us to avoid risks; thanks to routine we don't have to rediscover things; routine ensures efficiency while experimenting, it enables us to achieve a high level of predictability.

A contrary point of view : Routine kills invention and discovery, it is opposite to creativity; it is necessary to avoid routine so that the world can be changed for the better; young people ought to develop their imagination, but not learn routine; routine is the exact opposite of youthfulness; routine is boring; the best idea would be to combine routine with improvisation.

Exercise 5. Conduct a round-table discussion on «Superconductivity Research».

Use texts 11 A, B, C as a basis for the preparation of oral talks and discussion. Useful words and phrases of scientific communication are given in exercise 5 (see Lesson 10 «Conversation»).

Exercise 6. Read and smile.

For a long time Edison's visitors wondered (удивлялись) why the gate (калитка) to his garden was so difficult to open.

Once his friend said: «The gate to your garden is so heavy. I have to use all my strength to open it. I cannot understand this. You are such a brilliant man. You can invent something better». «The gate seems to be all right», Edison answered with a smile. «The fact is that it is a brilliant invention.» «You are laughing at me, sir!» «No, I am not. The gate is connected to a pump. Everybody who comes in pumps twenty litres of water out of the well (колодец).»

An absent-minded (рассеянный) professor was once travelling by electric train, and when the conductor came the professor couldn't find his ticket.

«It's all right, sir», said the conductor who knew the professor very well, «I'll come at the next station».

But at the next station there was the same difficulty, the professor couldn't find his ticket anywhere.

«It's all right, sir, it doesn't matter (не имеет значения)», said the conductor. «No, no I must find the ticket, I must know where I'm going to!»

Text 11B

Прочитайте текст и озаглавьте его.

Superconductivity is a state of matter that chemical elements, compounds and alloys assume on being cooled to temperatures near to absolute zero. Hence, a superconductor is a solid material that abruptly loses all resistance to the flow of electric current when cooled below a characteristic temperature. This temperature differs for different materials but generally is within the absolute zero (-273°C). Superconductors have thermal, electric and magnetic properties that differ from their properties at higher temperatures and from properties of nonsuperconductive materials.

Now hundreds of materials are known to become superconductors at low temperature. Approximately 26 of the chemical elements are superconductors. Among these are commonly known metals such as aluminium, tin, lead and mercury and several less common ones.

Most of the known superconductors are alloys or compounds.

It is possible for a compound to be superconducting even if the chemical elements constituting it are not.

Text 11C

Прочитайте текст и найдите информацию о применении сверхпроводников в будущем. Изложите кратко содержание текста по-английски.

New Hope for Energy

Recently some ceramic materials have been found to be superconductors. Superconducting ceramics are substances which can transmit electric currents with no loss of energy at temperatures much higher than conventional superconductors (that is, at the temperature of liquid nitrogen).

One use for the new superconductors would be to replace those that need the extreme cold of liquid helium — huge superconducting electromagnets used in nuclear magnetic resonance research, atomic particle acceleration and research reactors.

Other types of electromagnets made with superconductors could be used to lower the cost of electric generation and storage. Such uses may take 10 years of research, a quicker use will probably be in electronics.

Researchers now estimate that tiny but immensely powerful highspeed computers using superconductors may be three to five years away. Further off are 300 m.p.h. trains that float on magnetic cushions which now exist as prototypes but may take at least a decade to perfect. Power lines that can meet a city's electric needs with superconductor cables may be even further in the future.

Meanwhile, scientists around the world are trying to turn the new materials into useful products. Among the most notable is a micron-thin film to transmit useful amounts of electric current without losing superconductivity. The film could be used in the microscopic circuitry of advanced computers as high-speed pathway (маршрут, соединение) between computer chips.

Several nations are known to be very active in superconductor research. For example, the United States is spending millions of

dollars on such research, much of it for military uses: projectile accelerators, lasers, ship and submarine propulsion.

Text 11D

Прочитайте текст и расскажите по-английски о Массачусетском Технологическом Институте.

Massachusetts Institute of Technology

MIT is an independent university located in Boston area. It was founded in 1861 by William Barton Rogers, a distinguished natural scientist, who believed professional competence to be best fostered (воспитывать) by the combining of teaching, research, and the application of knowledge to real-world problems. MIT held its first classes in 1865 after having delayed opening because of the Civil War. There were approximately 15 students enrolled at that time.

Today MIT has about 9,700 students, a faculty (профессорско-преподавательский состав) of approximately 1,000 and several thousand research staff. The total teaching staff numbers more than 1,800. The institute is broadly organized into five academic Schools — Architecture and Planning, Engineering, Humanities and Social Science, Management and Science — and a large number of interdisciplinary programs, laboratories, and centers, including the Whitaker College of Health Science, Technology and Management. A unique feature of MIT is that undergraduates join with graduate students, faculty, and staff to work on research projects throughout the institute.

Most academic activities take place in a group of interconnected buildings designed to permit easy communication among the Schools and their 22 departments. Across the street from this set of buildings there are athletic fields, the student center, and many of the dormitories.

The main purpose of the academic program at MIT is to give students a sound command (прочное усвоение) of basic principles, the habit of continued learning and the confidence that comes from a thorough and systematic approach to learning. This results in continued professional and personal growth, especially in today's rapidly changing world.

The two essential parts of all MIT educational programs are teaching and research. Both of these activities carried on together have greater potential than either performed alone. They provide experience in theory and experiment for both students and teaching staff.

Each student pursues a degree (стремиться получить степень) in one of the departments.. Undergraduate courses at MIT lead to the degree of Bachelor of Science (S.B.). The academic programs require four years of full-time study for the Bachelor of Science. Degrees are awarded on the basis of satisfactory completion of general institute and departmental requirements (общейинститутские и кафедральные требования) in each program.

There is enough flexibility (гибкость), however, to allow each student, in collaboration with the adviser, to develop an individual program in accordance with his or her own interests and preparation.

ДОПОЛНИТЕЛЬНЫЕ ЗАДАНИЯ

Упражнение 1. А. Прочитайте словосочетания из текста 11А и постарайтесь понять значения выделенных слов.

1. the **threshold** of a new technological age
2. who was **awarded** the Noble Prize
3. which **won** for them the Noble Prize
4. their quality is often **uneven**

В. Подберите к каждому выделенному в А слову соответствующее ему по значению.

- a. give or grant (by official decision)
- b. irregular, changing
- c. start, beginning
- d. get by means of hard work or struggle as a result of competition

Упражнение 2. А. Прочитайте текст и постарайтесь понять значения терминов *memory cells*, *windings*, *coils*.

The practical applications of superconductivity are limited because of the very low temperatures required. Some materials, for example lead, become almost perfect conductors at very low temperatures at the absolute zero (-273°C). However, a number of uses have been proposed.

If a current is induced by a magnetic field in a ring of superconducting material, it will continue to circulate when the magnetic field is removed. In theory this could be made use of in the memory cells of computers. **Memory cells** made of superconducting material could store information indefinitely. Because of the zero resistivity of the cells, the information could be retrieved quickly, as fast as 10^{-8} seconds.

90 per cent of the total losses in modern transformers is due to the resistance of the **windings**. Transformers could be made with windings cooled to the low temperature at which superconductivity occurs. The resistance would be zero and the transformer would be almost ideal. Similarly, a 100 % efficient electric motor has been proposed using the magnetic field of superconducting **coils**.

В. Подберите к каждому слову в колонке А соответствующее из колонки В.

A	B
1. induce	a. find, get back
2. remove	b. unlimitedly
3. indefinitely	c. spiral
4. memory cell	d. length of wire wound in a spiral to conduct electric current
5. retrieve	e. bring about
6. winding	f. take off, away
7. coil	g. the unit of computer which stores data for future use

С. Найдите в тексте, приведенном в А, три пары синонимов.

Д. Заполните таблицу на словообразование.

Verb	Noun	Adjective
...	retrieval	...
...	...	removable
define	...	...
...	...	resistant
apply	...	...
...	...	conductive
present	...	...
...	...	explanatory
...	belief	...
...	introduction	...

Упражнение 3. Заполните пропуски словами *conduct, superconductivity, superconductor, superconductive*.

1. ... at high temperatures was almost discovered in 1979. 2. The Russian scientists found an oxide of metal they were experimenting

with to ... electric current. Moreover, the lower the temperature, the less resistance the material had. 3. The resistance continued to fall in liquefied nitrogen. To continue the experiments, they needed liquid helium. To obtain it was quite a problem at that time. So the experiments were stopped. 4. But it was this compound of copper, lanthanum and oxygen that proved to be a ... for which the Swiss physicists were honoured with a Noble Prize in 1987. 5. Later neither efforts nor money were spared (жалеть, экономить) for the study of the ... materials. Moreover, there were no longer any problems with helium.

Упражнение 4. А. Назовите 15–20 ключевых слов и словосочетаний на тему:

«Superconductivity research».

В. Speak about:

Latest achievements in conductivity research.

LESSON 12

Сослагательное наклонение

Многофункциональность глаголов *should, would*

Особенности пассивного залога

Глаголы *to involve, result in, result from*

Text 12A. *The International Space Station*

Text 12B. *Benefits of Building the ISS*

Text 12C. *Living Aboard the Space Shuttle and the ISS*

Text 12D. *Time Travel and New Universes*

ПРЕДТЕКСТОВЫЕ УПРАЖНЕНИЯ

Упражнение 1. Переведите предложения с глаголом-сказуемым в сослагательном наклонении.

A. 1. Would you like to come with us? 2. Would you be so kind as to tell me how to get to the Red Square? 3. Could you tell me the way to the main building of the University? 4. Would you mind giving me your dictionary for a minute? 5. Would you be kind enough to pass me the text-book? 6. I'd like to thank you for your help. 7. He'd like to meet you.

B. 1. You are the only person she would listen to. 2. The material in that book is very much out of date. The book must have been written a long time ago. 3. He speaks English well. He must have lived in the United States for a long time. 4. You could have done it in a different way. 5. It's strange he is not here. However, he might have forgotten all about it. Or he might have come while I was out. 6. For long journeys in private cars one could use automatic guidance systems. 7. One laser beam could carry all the radio, TV and telephone messages simultaneously.

C. 1. Mary wishes she could drive a car. 2. I wish that, for just a day, I were President of the United States. 3. I wish I had not spent so much money yesterday. 4. I wish when a boy I had studied

French instead of English. 5. John wishes he had been a mechanical engineer. 6. I wish I had a car. 7. I wish you had mentioned this fact to me before.

D. 1. If he were better educated, he would get the job. 2. Were I you, I should speak to him about it. 3. I would have called you if I had had your telephone number. 4. Had she felt better, she would have gone with them. 5. If you watched a laser operate, you might be surprised at the simplicity of a device capable of such power. 6. «If I had had a chance to live my life again, I should have tried to combine the study of the history of art, philosophy and science.» «But then you wouldn't be good at either.» «No, you are probably right, I'd be a dilettante.»

E. 1. K. Onnes found that it was necessary that a mercury wire be cooled to -265°C for electrical resistivity to disappear. 2. Tsiolkovsky proposed that liquid propellants should be used for space travel. 3. Recently it has been improbable that superconductivity should appear at an unbelievable temperature of 98 K in a special ceramic material. 4. The great speeds and high resistance of air demand that new hyperliners be built without windows. 5. It is essential that a superconductor should be a solid material and it is necessary that it should be cooled to -273°C . 6. It was natural for the ancient Greeks to suppose that the stars, planets, the sun and the moon move round the Earth in space. 7. It is possible that a compound should become a superconductor even if the chemical elements constituting it are not. 8. Copernicus suggested that the Sun and not the Earth should be at the centre of everything.

Упражнение 2. Переведите предложения, обращая внимание на союзы *in order that, so that, lest*.

1. A special system is being developed so that drivers could see after dark. 2. Aircraft designers tend to replace conventional metal alloys by new composite materials in order that an aircraft structure should be lighter. 3. Some materials are cooled almost to -273°C so that they should become superconductors. 4. Great attention is paid to ecological problems all over the world so that air in supercities should be clean. 5. You must put down this formula lest you should forget it. 6. Metal parts are tested for defects lest they should fail in operation. 7. Students must work hard lest they should fail at examinations. 8. All kinds of safety devices for motor cars are being developed lest accidents should occur. 9. A hypersonic craft will require complicated cooling measures lest it should burn.

Упражнение 3. Переведите предложения, обращая внимание на особенности страдательного залога.

1. International cooperation, especially in the field of space and science, may be spoken of as a long-standing tradition. 2. The «night vision» system is being worked at in many design bureaus. 3. The invention of an internal combustion engine was followed by the appearance of a motor car as we know it today. 4. Any flying vehicle is acted upon by aerodynamic forces. 5. The improvement of our working conditions and life is influenced by the achievements of scientific and technological progress. 6. New developments in the field of superconductivity are much written about at present. 7. The invention of a steam engine was followed by the first industrial revolution. 8. The neutron is not influenced by a magnetic field. 9. The appearance of a jet engine was followed by a tremendous increase of aircraft speeds. 10. The problems of interplanetary flight are dealt with in the latest magazine.

Упражнение 4. Переведите предложения с глаголом *to involve* и его производными (занимать, быть занятым, вовлекать, связанный с этим).

1. While on their last space flight French cosmonauts were mostly involved in carrying out scientific experiments. 2. A program to establish an International Lunar Base may involve many nations. 3. The struggle for the protection of Lake Baikal has shown the true position of the organizations involved. 4. To understand the operation of computers one must understand the principles involved.

СЛОВООБРАЗОВАНИЕ

Упражнение 5. Переведите производные слова согласно образцу:

префикс multi- (много-)

multi-room — *многоместный*, *multi-national* —
многонациональный

multi-stage rocket, *multi-purpose*, *multi-functional*, *multi-lateral*, *multiplex*, *multimedia*, *multi-ton vehicle*.

Упражнение 6. Прочитайте и переведите интернациональные слова.

international station [ˌɪntəˈnæʃənəl ˈsteɪʃən], *civilization* [ˌsɪvɪlaɪˈzeɪʃən], *orbit* [ˈɔːbɪt], *assembly* [əˈsembli], *shuttle* [ˈʃʌtl], *routine* [ruːˈtiːn], *partner* [ˈpɑːtnə], *multi-national* [ˈmʌlti-ˈnæʃənəl], *majority* [məˈdʒɔːrɪti], *astronaut* [ˈæstrənɔːt], *mission* [ˈmɪʃən], *official* [əˈfɪʃəl], *object* [ˈɒbdʒɪkt], *visible* [ˈvɪzɪbl], *module*

[ˈmɒdju:l], process [ˈprəʊses], ambitious [æmˈbɪʃəs], project [ˈprɒdʒekt], control [kənˈtrəʊl], commercial [kəˈmɜːʃəl], biotechnology [ˌbaɪəʊtekˈnɒlədʒɪ].

Упражнение 7. Прочитайте и запомните произношение слов.

launch [lɔːnʃ], extension [ɪksˈtɛnʃən], research [rɪˈsɜːʃ], facility [fəˈsɪlɪtɪ], crew [kruː], alternately [ɔːlˈtɜːnətli], expectancy [ɪksˈpektənsɪ], Venus [ˈviːnəs], awesome [ˈɔːsəm], Canada [ˈkænədə], Japan [dʒəˈpæn], Brazil [brəˈziːl], European [ˌjuərəˈpiːən], behave [bɪˈheɪv], trouble [ˈtrʌbl], citizen [ˈsɪtɪzn], dozen [ˈdʌzn], opportunity [ˌɒpəˈtjuːnɪtɪ], basic [ˈbeɪsɪk], purpose [ˈpʊːpəs], investigation [ɪnˌvestɪˈgeɪʃən], adventure [ədˈventʃə], promote [prəˈməʊt], require [rɪˈkwaɪə], billion [ˈbɪljən], enterprise [ˈentəpraɪz], advertise [ˈædvətaɪz].

СЛОВА И СЛОВСОЧЕТАНИЯ ДЛЯ ЗАПОМИНАНИЯ

add *v* — прибавлять, присоединять

advertise *v* — рекламировать

attract *v* — привлекать, притягивать

behave *v* — вести себя, работать

broad *a* — широкий

deliver *v* — доставлять

enterprise *n* — предприятие

establish *v* — учреждать, организовывать

explore *v* — исследовать, изучать

facility *n* — сооружение, оборудование

fit *v* — соединять, подгонять

flight *n* — полет

follow *v* — следовать (за)

hence *adv* — следовательно

implementation *n* — выполнение, осуществление

investigation *n* — исследование

last *v* — сохраняться, длиться

launch *v* — запускать

maintain *v* — обслуживать, содержать

mission *n* — задача, полет

note *v* — отмечать

opportunity *n* — благоприятная возможность

predict *v* — предсказывать

promote *v* — способствовать, содействовать

properly *adv* — должным образом, правильно

space *n* — пространство, космос

stay *v* — оставаться, жить

supply *v* — снабжать, обеспечивать

trouble *n* — неисправность, повреждение

alternately — поочередно

at least — по крайней мере

Text 12A

Что вам известно о проекте создания Международной космической станции? Как осуществляется проект на данный момент? Прочитайте текст, проверьте ваши ответы, переведите.

The International Space Station

The International Space Station (ISS), the most complex and expensive structure that has ever been launched and built in space, is expected to be a permanent off-planet extension¹ of human civilization. When completed, it will be a multi-room hotel and research facility orbiting the Earth every 90 minutes. By that time, resupply and assembly flight by shuttles or rockets will have become routine.

The Russians and Americans are partners in this international enterprise. The three-person multi-national crews will be alternately composed of two Americans and one Russian followed by a Russian majority. Later a six or seven-person crew will occupy the station. Some astronauts may stay on the ISS up to 187 days, but there are no plans yet for longer missions. The official life expectancy of the station itself is 10 years, but it should last much longer.

Five times the size of the Russian space station Mir, the ISS will be one of the biggest objects in the night sky, looking like a supersize Lego set², almost as long as a football field. Only the Moon and Venus will be bigger and more visible.

The fifth-generation station's complexity is as awesome³ as its size. Built by a partnership of 16 nations, the ISS will consist of 36 modules and hundreds of individual elements that come from all over the world. The station involves the most technologically advanced nations — Russia, the United States, Canada, Japan, Brazil, and 11 European nations. There will be many interconnected parts from so many countries that it would be impossible to predict how they would interact.

Hence, it is very important that all of these elements made by different suppliers should fit together properly and work exactly as planned. But even if all the parts fitted perfectly, the assembly process itself in orbit would be risky. The space station is flown while it is being constructed and each new building block added might change the way the station behaves in flight, which could result in serious trouble.

The ISS may be the world's most ambitious engineering project in history, but it could not have been realized without previous extensive experience in operating the Russian Mir space station. Mir

was a great achievement. Russia learned how to build and maintain complex structures in space. Mir also gave citizens of more than a dozen countries their first opportunity to explore space. It should be noted that Mir has proved to be the perfect training ground for the ISS. For more than a decade, at least two humans were always in low Earth orbit. That is why it was planned that Russia would supply and deliver 12 modules for the future station, each being a key module among its 36 ones. They are: the basic power module, the control, the life support, the service modules and others.

What is the purpose of the ISS? It is a political program as well as a science program. This program is no longer only about conducting scientific investigations in the absence of gravity, or about learning how to build a massive project weighing 400 tons in orbit, or about establishing the base for a future trip to Mars. The ISS is more than merely the next great adventure of the space age. It is also about promoting international cooperation and creating thousands of peacetime jobs for highly skilled workers and engineers.

The implementation of the broad international program would require more than \$40 billion. Some space experts would like to attract commercial users such as, e.g., biotechnology companies in order that the cost of the station should be lowered. And some specialists have even suggested that the station be used for advertising and Hollywood filmmaking.

Notes to the Text

1. off-planet extension — внепланетное продолжение
2. Lego set — конструктор Лего
3. is awesome — поражает, внушает благоговение, трепет

УПРАЖНЕНИЯ

Упражнение 8. Определите различные функции глагола *should*, переведите.

1. It should be said that the importance of Mars studies is acknowledged by all. 2. Reliability of every vehicle should be paid great attention to during the production process. 3. It is required that an airplane should be well balanced dynamically. 4. Should there be even a small deviation (отклонение) in the velocity, the space vehicle would pass the planet. 5. К.Е. Tsiolkovsky suggested that man-made rockets for the future space flights should use liquid-propellant engines. 6. We were told that we should take part in the discussion. 7. One should not forget that electricity is the most important source of energy at present.

Упражнение 9. Определите различные функции глагола *would*, переведите.

1. Halley predicted that the comet would appear at regular intervals of 75 years. 2. If you were on the first manned space station your task would be to study the stars and planets including Earth. 3. Some materials cooled to proper temperature would conduct electricity practically without any resistance. 4. In the future it may be possible to build a dirigible with a metal hull that would carry hundreds of passengers round the world. 5. In 1883 Tsiolkovsky wrote that rocket would be the only means able to reach outer space. 6. Popov would make his experiments with radio although the government was not interested in the work. 7. We tried to start the car, but it would not go. 8. We know that a body in motion would continue to travel in a straight line unless some force were applied. 9. Without gravity we would not be able to walk in an upright position. 10. Non-equatorial regions of Mars would be difficult and expensive to reach and explore.

Упражнение 10. Найдите предложения, где *should* является модальным глаголом и где глаголы *would*, *could* и *might* выражают сослагательное наклонение.

1. It is essential that international cooperation should be as productive as possible. 2. Research and technology should provide the basis for a better life. 3. Military uses of a space station could complicate international cooperation since there are several neutral countries among the participants. 4. It is desirable that international space cooperation should give significant economic advantage for the countries involved. 5. NASA agreed that Canada would develop a remote manipulation system for the space Shuttle. 6. It should be pointed out that Japan space programmes are based on close government-industry cooperation. 7. The craft to be launched would essentially be used as a service module for space stations. 8. Typical missions of a new system might include the assembly of space structures. 9. Exploring Phobos would be a difficult problem because of its small gravity field. If an astronaut threw a stone right ahead, it would orbit the entire moon and hit him in the back of the head. 10. Such a vehicle could be operational by the beginning of the next century. 11. One should know that the broader the basis for utilizing a space station is, the better the prospects for economic efficiency of developing it are. 12. After the Challenger tragedy the military experts insisted that a new Shuttle should be built. 13. It was reported that the appearance of photon computers could be expected.

Упражнение 11. Переведите предложения, обращая внимание на особенности страдательного залога.

1. In mechanics the study of kinematics is followed by the study of dynamics. 2. A gas may be looked upon as the vapour of a liquid with a very low boiling point or very great vapour pressure. 3. Lead is very slightly acted upon by the oxygen of the air. 4. The works of Tsiolkovsky were followed by a number of very important works in the field of astronautics. 5. The production of special metallurgical alloys is seldom influenced by gravity. 6. This article describes design characteristics which are followed by the description of the results of the experiments. This description is followed by a discussion of nontechnical aspects of the lunar programme proposed.

Упражнение 12. Переведите предложения с глаголом *to result* с различными предлогами.

1. It is well known that automation results in higher labour productivity. 2. The first manned space flight has resulted from the great achievements in Russian science. 3. This experiment resulted in the discovery of several new properties of the composite material. 4. A release of atomic energy results from a very complex process. 5. World War II resulted in the victory of the USSR, the US and Great Britain. 6. Such experiments usually result in obtaining new information. 7. The motion of an electron results from a force acting upon it. 8. The growing intensity of air traffic has resulted in the automation of its control. 9. Newton's famous work «Principia» resulted from 40 years of experimental work.

УПРАЖНЕНИЯ ДЛЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ

Упражнение 13. Определите, к каким частям речи относятся слова.

gravity, peaceful, permanent, consequence, subatomic, dominant, relative, relativity, flexible, apparently, celebrity, novelty, connection, complicate, desirable, significant, utilize, pressure, famous, involvement, significance, weightlessness, eaten, recorder, suppression, useless, dense, density, depth, damage, shorten.

Упражнение 14. Образуйте существительные от слов.

appear, explore, prepare, prior, important, implement, transit, propose, create, lighten, encode, structural, useful, discuss, grow, store, differ, electronic.

Упражнение 15. Найдите:

а) синонимы

spacecraft, to call, artificial, significance, area, man-made, satellite, purpose, complicated, importance, space vehicle, explorer, aim, to guide, to offer, researcher, investigation, to incorporate, sophisticated, to propose, to determine, exploration, to define, to gather, to control, to collect, to name, to include, district, moon;

б) антонимы

special, upper, unmanned, natural, last, manned, unequal, conventional, distant, first, lower, civil, equal, inefficient, military, near, efficient, artificial.

Упражнение 16. Переведите предложения с глаголом *to involve* и его производными.

1. NASA began looking for the way to involve other countries in its post-Apollo space programme. 2. International involvement in the space programme raises a number of questions. 3. The international programme has involved Russia, Canada, Japan and some developing countries, as well as both individual European countries and various European space organizations. 4. There exists a clear trend towards increased international involvement in those uses of space which could be economically beneficial. 5. The aim of the experiment involving dogs, monkeys and other animals aboard Kosmos satellite was to study the way zero gravitation affects the living organisms. 6. An efficient radiator is capable of warming a large room, the process involved is called convection. 7. Work with computers and other sophisticated electronic devices involves two different types of construction: hardware and software.

Упражнение 17. Переведите предложения, обращая внимание на функции слова *only*.

1. You are the only person who could help us in solving this problem. 2. The International Academy of Astronautics including nearly one thousand scientists and engineers from 50 countries is the only organization which can plan technical efforts on an international scale. 3. Only through cooperation on a world-wide scale could space technology be improved. 4. Effective communication across national borders appeared to be the only way for space science to develop successfully.

Упражнение 18. Найдите глаголы-сказуемые в страдательном залоге, переведите.

Dolly Madison was born in South Carolina while her parents were visiting there. She was soon taken to Virginia where she was educated. She was taught by her Quaker parents to say «thee» and «thou» for «you». Dolly was married to John Payne who died a short time afterwards from yellow fever. Several years later she was married to James Madison, a brilliant lawyer. When Thomas Jefferson was elected President of the US, James Madison became Secretary of State. Mr. Jefferson was a widower, so Dolly was often invited to preside at the White House. When James Madison was elected president, Mrs. Madison was the hostess of the White House on all occasions. People from everywhere were impressed with her sincerity and her love for humanity.

Упражнение 19. Дайте недостающие формы глаголов, запомните их.

beaten, steal, carrying out, learnt, ate, slept, fly.

Упражнение 20. Прочитайте и переведите текст без словаря.

Exploration experts suggest that the tiny moon Phobos should be used as a perfect place for gas refilling station. Some scientists think Phobos rocks to contain crystalline ice. If one heats them, it will be possible to produce water. The latter could be divided into hydrogen and oxygen which are necessary components for rocket propulsion. Such a fuel supply would greatly reduce the amount of weight that must be delivered from the Earth for manned missions to Mars. Thus, it might be possible for spacecrafts to leave the Earth for Mars carrying no return fuel. To get home, they should simply fill up at Phobos.

CONVERSATION

Exercise 1. Answer the questions.

1. What is the ISS? (the most complex and expensive structure in space and research facility orbiting the Earth) 2. What will it look like when completed? (a supersize Lego set, almost as long as a football field) 3. What is its size compared with Russian-built Mir space station? (five times the Mir station size) 4. What modules is it expected to consist of? (36 modules) 5. How many countries are involved in the project? (16 countries) 6. What methodology is being

used to build the ISS? (the same methodology as for Mir but on a larger scale) 7. What is the purpose of the ISS? (to promote international cooperation and create peacetime jobs for highly skilled workers and engineers)

Exercise 2. Make a sentence out of the two parts.

1. The Russians and Americans are equal partners	1. to be more than \$40 billion.
2. It is suggested that	2. that all individual elements coming from different suppliers all over the world should fit together properly.
3. It is very important	3. Russia deliver 12 key modules for the station.
4. The multi-national crew will occupy	4. the official life of the station to be 10 years.
5. Space experts expect	5. the station and stay on it up to 187 days.
6. The cost of the station is likely	6. than merely the next great adventure of the space age: it is a political program as well as a science program.
7. The ISS is more	7. in the implementation of this massive engineering project weighing 400 tons.

Exercise 3. Read and learn.

Satellites

- Peter: Hello, Ann. How did you happen to come to California?
- Ann.: Hello, Peter. How are you? My father got a job here. It is so exciting to meet you here. I've not seen you since you graduated from the University.
- P.: I'm working on a newspaper. I cover the space research problems. Now I study the application of space satellites for scientific purposes.
- A.: I think that the best application of satellites is for military purposes.
- P.: You are absolutely wrong. The most promising field of application of satellites is the scientific one.
- A.: Oh, Yes, I know satellites look down on everything: the clouds, forests and oceans, the winds, ice on the sea. But don't forget spy (шпион) satellites.

- P.: Spy and weather satellites gather data for forecasting. The Japanese have a satellite studying the ocean; European and Russian satellites produce radar images of the ground; an American satellite is studying the upper atmosphere.
- A.: It seems to me that the era of satellites has passed. You see, the Japanese have already delayed the launch of their earth observing mission.
- P.: Yes, they did, because of cost. The most effective way to gather data is not always with a big satellite.
- A.: Have you met my elder brother Mike?
- P.: Of course, I have. We played in the same football team at the college, though he is about three years older than me.
- A.: He is five years older than you. He takes part in the research programme at the Goddard Institute for Space Studies. They are developing now a small cheap satellite. It would carry three simple instruments to measure clouds, water vapour and surface temperature.
- P.: Oh, really. I think, that such researches make sense, and help develop a single Global Climate Observing System.
- A.: Such a system could change the world or at least see the world changing.

Exercise 4. Comment on the following statement.

Space exploration ought to be abandoned (откладываться) until more important problems of mankind have been solved.

One point of view : Space exploration is very expensive; food production is far more important than Mars studies or Moon walks; it is immoral to spend huge sums of money on space exploration while millions of people suffer hunger (голод); space exploration is useless anyway because we can't colonize other planets; it would be much better to colonize, for example, the Sahara before trying to colonize the Moon or Mars; mankind must not waste its resources.

A contrary point of view : Space exploration is of great significance for scientific and technological development; space exploration gives man new knowledge that he can use for other purposes; we may find 10,000 things to do on the ISS that nobody has thought of or even imagined.

Exercise 5. Conduct a scientific conference on: «The potential of space exploration for peaceful purposes».

Use texts 12 A, B, C, exercise 3 (Satellites) as a basis for the preparation of oral talks and discussion. Useful words and phrases of scientific communication are given in exercise 5 (see Lesson 10 «Conversation»).

The Farmer and the Apple Tree

A farmer once had a friend who was famous for wonderful apple trees which he grew. One day this friend gave the farmer a fine young tree and told him to take it home and plant it. The farmer was pleased with the gift, but when he got home he did not know how to plant it. If he planted it near the road, people might steal the fruit. If he planted it in his field, his neighbours might come at night and rob (грабить) him. If he planted it near the house, his own children might steal the apples. Finally he planted the tree deep in the woods where no one could see it. But naturally the tree couldn't grow without sunlight and suitable soil. In time, it withered (засыхать) and died.

Later his friend was criticising him for planting the tree in such a poor place.

«What is the difference», the farmer said. «If I had planted the tree near the road, people would have stolen the fruit. If I had planted it in my field, my neighbours would have come at night and robbed me. If I had planted it near my house, my own children would have stolen the apples».

«Indeed! But at least someone could have enjoyed the fruit», said his friend. «Now you have robbed everyone of the apples, and you have destroyed a fine tree».

A farmer's wife spent most of her time wishing for things which she did not possess. She wished she were beautiful; she wished she were rich; she wished she had a handsome (красивый) husband. Therefore one day fairies (волшебницы) decided to give her three wishes as an experiment.

The farmer and his wife talked for a long time over what she would wish for. But the farmer's wife suddenly became a little hungry (голодный) and wished she had some sausages to eat. At once her plate was full of sausages. Then a heated argument began, because her husband said his wife had wasted one of the valuable wishes on such a cheap thing as sausages. The argument grew hotter, and finally the wife cried that she wished the sausages were hanging from her husband's nose. At once a row of sausages flew to her husband's nose and stayed there. Nor could they be removed.

Now there was the only one thing the poor woman could do. She really loved her husband and so she had to spend her third wish

in removing the sausages from his nose. Thus, except for the few sausages, she got nothing from her three wishes.

Text 12B

Прочитайте и переведите текст без словаря. Назовите наиболее практичные на ваш взгляд исследования на Международной космической станции.

Benefits of Building the International Space Station

When studying sound, you go into a quiet room. When studying light, you go into a dark room. When studying the effects of gravity, you would like to go into an «anti-gravity» room. Since there is no such thing on Earth, we have the International Space Station.

By flying around Earth at about 17,500 mph the station and everything in it remain in orbit, a continuous free fall around the planet. In orbit, forces are balanced and the effects of gravity are essentially removed. The result is microgravity, one of the unique phenomena of the ISS environment that promises new discovery. Thus, the ISS allows long-term exposure to a world nearly unexplored.

Gravity affects everything. From our bodies to the materials we use to build cars and buildings, to the flames we use to heat our homes, our world is controlled by gravity. Even flames burn differently without gravity. Reduced gravity reduces convection currents, the currents that cause warm air or fluid to rise and cool air or fluid to descend on Earth. This absence of convection changes the flame shape in orbit and allows studies of the combustion process that are impossible on Earth. The absence of convection allows molten metals or other materials to be mixed more thoroughly in orbit than on Earth, opening the way to a whole new world of composite materials. Scientists plan to study this field, to create better metal alloys and more perfect materials for applications such as computer chips. Investigations that use lasers to cool atoms to near absolute zero may help us understand gravity itself.

While investigating our surroundings, we have been limited, until recently, to accepting gravity as a given factor in all our studies. History shows that changing what once was constant can lead to revolutionary discoveries.

The 19th century saw temperature and pressure become controlled in new ways to use steam power and revolutionize the way we live. The 21st century offers the hope of controlling gravity's effects to understand why things behave the way they do. Observing and understanding this behaviour is key to new discoveries in many scientific disciplines and using that knowledge is key to the im-

provement of life on Earth. The station will allow mankind to perform research that may result in new medicines, materials and industries on Earth and will benefit people all over the world.

The Space Station Mir gave us a platform for long-term microgravity research, and important knowledge about how to live and work in space. Like all research, we must proceed one step at a time. As we open one door, answering one question, we are faced with the opportunity of more doors, more questions.

The ISS is the next step in that journey of discovery, and represents a quantum leap (скачок) in our capability to conduct research on orbit. In space, electrical power is key to the quantity and quality of research. When completed, the ISS's enormous solar panels will supply 60 times more power for science than did Mir. This and the large space available for experiments will provide scientists with unprecedented access to this unique environment.

Aboard the ISS scientists will explore basic questions in the fields of biotechnology, biomedical research, fluid physics, fundamental biology, physics, Earth science and space science. Observations of the Earth from orbit are expected to help the study of large-scale, long-term changes in the environment. The effects of air pollution, such as smog over cities; the cutting and burning of forests, and of water pollution are visible from space and can provide a global perspective unavailable from the ground.

Thanks to its research and technology the station is certain to serve as an absolutely essential step in preparation for future human space exploration.

Text 12C

Прочитайте текст и опишите жилые отсеки Шаттла и Международной космической станции.

Living Aboard the Space Shuttle and the ISS

We often see the cosmonauts carry out their complicated work in space, but what do they do in their off-duty hours? What do they eat, where do they sleep?

One of the main features of the Shuttle is the relatively low forces of gravity during launch and reentry. These are about 3 g, that is within the limits that can be withstood by people.

Its living accommodation is relatively comfortable. The crew cabin is 71.5 m. There are two floors inside the cabin. On the top level, the commander and pilot monitor and control sophisticated equipment. Behind their seats is a work area where the crew can carry out experiments.

The bottom level is the living area. It contains facilities for sleeping, eating and waste disposal.

Living in such a kind of cabin requires only ordinary clothing. Air pressure is the same as the Earth's at sea level. This air is made of 80 % nitrogen and 20 % oxygen. The air is cleaner than the Earth's. Temperature can be regulated between 16 and 32 °C.

The Shuttle meals are eaten in a small dining area consisting of a table and restraints (ограничители) which function as chairs while eating in zero-gravity. Meals are served in a special tray which separates different food containers and keeps them from floating around in the weightless cabin. Most foods can be eaten with ordinary spoons and forks as long as there are no sudden starts and stops.

Just as on Earth recreation and sleep are important to good health in space. Different games, books and cassette-recorders to listen to music are available.

In zero-gravity there is no «up» position and the cosmonaut is oriented in the sleeping bag as if he or she were sleeping up. Now beds are built into the walls with an individual light, communications, fan, sound suppression, blanket and sheets. They even have pillows.

Experiences on the space shuttle have helped prepare astronauts for life aboard the International Space Station. Let's imagine the life at the station in several years.

Life-support systems on the ISS can supply cleaner air, purer water, better food and more sanitary toilet facilities than on the space shuttle. Life aboard the station may not be easy, but it is significantly healthier and more pleasant than in the past, allowing astronauts to focus on the scientific research and station maintenance that occupy them for about 9 hours a day.

The kitchen on the station, for the first time in space history, has refrigerators and freezers. It may not sound like much, but it is a giant step forward. For the first 30 years in space, all food was kept at room temperature. Only now, in the 21st century, can refrigerator allow NASA to supply milk to help with bone loss in space flight. A glass of nice cold milk was asked for years. And the refrigerator proved to be an easier solution than a lot of experiments to make good powdered (порошковое) milk for a number of years.

Later in the day, thanks to another kitchen appliance, cosmonauts will eat a frozen dinner just like the ones sold in supermarkets. The combination convection/microwave oven automatically thaws (размораживать) your food (using heat), then heats it with microwaves (just as they do on Earth).

The refrigerator, freezer, and oven mean that astronauts eat a healthier diet. The shuttle food was low in fiber. «The ISS food can overcome that with salads, fruit, vegetables, apples, oranges, etc.,» a space expert had predicted. Now, with these food delivered by the space shuttle a few times a year, you no longer have to take special tablets.

There is no dishwasher in the kitchen. Instead, you wash your magnetic silverware (столовые приборы) with antiseptic towelettes (салфетка). It does not seem very hygienic, but the shuttle astronauts just had to lick their silverware clean.

The empty food containers will be either ejected into space to burn up on re-entry to the atmosphere or returned to Earth on the shuttle.

The next step in life support will be a completely closed air-and-food cycle, with plants grown in space. Plants and microorganisms could even help remove contaminants from the water supply. It is that sort of research that will be necessary if people are ever to establish settlements far beyond Earth.

Biological approaches to supplying food, water, and air could not only save power aboard the station, but could also reduce the number of resupply trips required.

May be some day astronauts will have fresh bread on the station. But even with today's frozen dinners, they already spend 4 hours a day on meals and hygiene. Exercise takes 2 hours more a day. That leaves them just an hour of free time for the simple pleasures of life in space: The view of Earth through the window. A letter e-mailed from their family. Microwave popcorn with a movie. And the friendship of the crew members with whom they share this tiny world.

Text 12D

Прочитайте текст, выскажите свое мнение о его содержании.

Time Travel and New Universes

It is known that for a long time well before Albert Einstein scientists were studying the ideas that seemed strange. Consider a few of such ideas now accepted by the scientific community: clocks that tick slower when they are on rockets in outer space, black holes with the mass of a million stars compressed into a volume smaller than that of atom and subatomic particles whose behaviour depends on whether they are being watched.

But of all strange ideas in physics, perhaps, the strangest one is the hole in the structure of space and time, a tunnel to a distant

part of the universe. American researchers have determined that it will apparently be possible in principle for mankind to create an entirely new universe by using the idea of wormhole (ход, прорытый червем; червоточина) connection. Such a universe will automatically create its own wormhole, squeeze through it, and then close the hole after it.

Although to many people such an idea may seem useless and fantastic, it can help scientists to develop their imagination and explore how flexible the laws of physics are. It is such an idea that could give answers to some of the fundamental questions of cosmology: how the universe began, how it works and how it will end.

The idea of wormhole comes directly from the accepted concepts of general relativity. In that theory A. Einstein proved that very massive or dense objects distort space and time around them. One possible distortion is in the form of a tube that can lead anywhere in the universe — even to a place billions of light years away. The name «wormhole» comes about by analogy: imagine a fly on an apple. The only way the fly can reach the apple's other side is the long way over the fruit's surface. But a worm could make a tunnel through the apple and thus shorten the way considerably. A wormhole in space is the same kind of tunnel; it is a shortcut (кратчайшее расстояние) from one part of the universe to another that reduces the travel time to about zero.

In fact, instantaneous travel leads to the idea of wormhole as time machine. If it were possible to move one end of a wormhole at nearly the speed of light, then, according to general relativity, time at that end would slow down and that part of the tunnel would be younger than the other end. Anything moving from the faster-aging end of the wormhole to the slower one would essentially go backward on time. The type of travel, however, could be nothing like the mechanical time machine described by H. Wells. It is difficult to imagine how a human being could move through a wormhole, since it would theoretically be narrower than an atom and it would tend to disappear the instant it formed.

ДОПОЛНИТЕЛЬНЫЕ ЗАДАНИЯ

Упражнение 1. А. Прочитайте словосочетания из текста 12А и постарайтесь понять значения выделенных слов.

1. **life expectancy**
2. **risky** process
3. **key** module

4. **life-support** module
5. the next great **adventure**
6. **merely**

В. Подберите к каждому выделенному в А слову соответствующее ему по значению.

a. essential to	d. expected period during which smth. is active and useful
b. activity full of risk, danger and excitement	e. only, simply
c. full of risk	f. equipment providing an environment astronauts may live in.

Упражнение 2. Найдите в тексте 12А:

А. Прилагательные с суффиксами *-al*, *-ous* и *-ive*, соответствующие словосочетаниям:

1. between different countries
2. connected with one person or part of smth.
3. connected with one country
4. that supplies reliable information
5. of technology
6. of the state, government and politics
7. coming earlier in time
8. important because of possible danger
9. full of strong desire to be or to do smth.
10. broad, extending in various or all directions
11. high priced

В. Словосочетания с этими прилагательными и приведите свои примеры.

Упражнение 3. А. Прочитайте текст и найдите слова, означающие:

height, propelling force, wished, be greater than, pressing, what remains, force directed forward, remain in space at one place, spending or using, thrust without losses, braking, small (not serious or important).

Solar Sails

If we are going to open the solar system to rapid economic travel, we need to find advanced space propulsion systems. Solar sails may be among the keys to future interplanetary flights.

Solar sail propulsion uses large, lightweight reflectors attached to spacecraft that react to the light pressure from solar photons to obtain thrust. By tilting (наклонять) the sail to change the force direction, the light pressure can be used to increase the orbital speed of the spacecraft, sending it outward from the Sun, or decrease its orbital speed, allowing it to fall inward.

A new type of solar sail, called a solar photon thruster, has a large sail that always faces the Sun for maximum light collection. The collector sail has a slight curvature (кривизна) that focuses the sunlight down onto a much smaller sail, which redirects the sunlight to provide the net thrust vector desired. Besides being more efficient than a standard sail, a solar photon thruster can be launched at Shuttle altitudes. Standard sails can only operate above 1,000 km where the light pressure exceeds the atmospheric drag.

Were a solar sail made light enough, it could «hover» without orbiting, the light pressure from the solar photons balancing the gravity attraction of the Sun and/or Earth. Then it would be possible to use solar sails first for communication, broadcast, and weather satellites, second for scientific stations hovering over the Sun and the rest of the solar system, and third for transporting cargo to and from Earth, the planets, and asteroid belt — without an expenditure of fuel.

В. Найдите к словам в колонке А антонимы из колонки В.

A	B
1. long	a. absence
2. forward	b. permanent
3. increase	c. rapid
4. heavy	d. short
5. slow	e. lightweight
6. invisible	f. complexity
7. changing	g. rearward
8. with	h. inward
9. simplicity	i. visible
10. rise	j. without
11. presence	k. decrease
12. outward	l. fall

С. Составьте словосочетания глаголов из колонки А и существительных из колонки В.

A	B
1. launch	a. study, investigation, research, experiment, test
2. promote	b. speed, thrust, pressure, cost, drag
3. conduct	c. satellite, spacecraft, space station, rocket
4. increase/lower	d. cooperation, development, technical progress

Упражнение 4. Заполните пропуски словами.

aboard life-support key facilities assembly supply maintenance stays
weightless tool

1. ... systems of the ISS are expected to be the most advanced, they can ... cleaner air, purer water, better food, and more sanitary toilet ... than on the space shuttle. 2. Life ... the station may not be easy, but it is significantly healthier and more pleasant than in the past, allowing astronauts to focus more on the scientific research and station ... that occupy them for about 9 hours a day. 3. Thanks to the long ... on Mir station researchers learned that bone loss did not lessen over time as previously thought. 4. In the ... environment of space, everyday activities present new challenges. 5. The Mobile Servicing System to be supplied by Canada is a four-piece robotic ... that will play a ... role in ... and maintenance of the ISS.

Упражнение 5. А. Назовите 15–20 ключевых слов и словосочетаний на тему «The International Space Station».

В. Speak about:

Solar sail propulsion systems.

REVISION OF LESSONS 10–12

Упражнение 1. Повторите инфинитив, инфинитивные конструкции, сослагательное наклонение и особенности пассивного залога. Переведите предложения.

1. The Internet is a great place to find and hear hit songs, movies and recorded interviews. 2. It is imperative that the experiment begin at once. 3. If I were you, I should stop the experiment. 4. He wished he were a cosmonaut. 5. A new car model was much spoken about. 6. Nobody saw the professor enter the laboratory. 7. It seems to be an interesting comparison. 8. His experience in the field of materials science can be relied upon. 9. This theory is hard to prove. 10. The new discovery was often referred to. 11. We expect this book to appear in bookshops very soon. 12. Scientists appear to know very little of this phenomenon yet. 13. The main problem is for the report to be published as soon as possible. 14. Materials to be brought back to Earth from space laboratories will have some stable properties. 15. It is unusual for a program to work correctly the first time it is tested. 16. Some experiments on the ISS could result in the development of clocks a thousand times more accurate than today's atomic clocks. 17. There are all kinds of life-supporting equipment aboard a spacecraft as it is essential that cosmonauts should feel themselves as comfortable as possible. 18. Lasers are supposed to be able to solve a number of very complicated problems connected with medicine. 19. One of the most important requirements for hypersonic craft is a sophisticated cooling system lest extreme temperatures should destroy the craft. 20. Educational system suggested by William Rodgers, the founder of MIT, proved to be very effective and to give a sound command of the basic principles of science and technology. 21. People always wished that there were a device that could vaporize the hardest and the most heat-resistant material. 22. A number of important innovations such as reducing the weight of airplanes and spacecrafts would have been impossible unless composite materials had been developed. 23. Scientists discovered superconductors to possess thermal, electric and magnetic properties quite different from the non-conducting materials. 24. The cost of electricity generation has been influenced by the development of electromagnets made with superconductors. 25. To produce the superconductive effect, a Dutch physicist cooled a mercury wire below a temperature of -269°C . 26. We know optical disks to store much more information than a plastic disk of the same size. 27. Laser was dreamt of by mankind

for centuries. 28. The applications of laser in industry and science are known to be numerous and varied. 29. The appearance of laser was followed by the fabrication of ultrathin silicon fibers capable of servicing as lightweight conductors. 30. Some metals and glasses to be cooled down to the point of solidification in space can be brought back to Earth.

Упражнение 2. Прочитайте и переведите текст, обращая внимание на инфинитивные конструкции.

Programming Languages

The only language computers can understand directly is called machine code. It is known to consist of the 1s and 0s (binary code) that are processed by the CPU. However, machine code as a means of communication is very difficult to write. That is why it is necessary to use symbolic languages that are easier to understand. Then, by using a special program, these languages can be translated into machine code.

Basic languages, in which the program is similar to the machine code version, are known as low-level languages. In these languages, each instruction is equivalent to a single machine code instruction, and the program is converted into machine code by a special program called an assembler. These languages are considered to be still quite complex and restricted to particular computers.

To make the program easier to write and to overcome the problem of intercommunication between different types of machines, higher-level languages were developed such as BASIC, COBOL, FORTRAN, Pascal, Ada, C and others. A higher-level language is a problem oriented programming language, whereas a low-level language is machine oriented. This means that a high-level language is a convenient and simple means of describing the information structures and sequences of actions to be performed for a particular task.

A high-level language is independent of the architecture of the computer which supports it. This has two advantages. Firstly, the person writing the program does not have to know anything about the computer the program will be run on. Secondly, programs are portable, that is, the same program can (in theory) be run on different types of computer. Programs written in one of these languages should be converted by means of a compiler into a lower-level language or machine code so that the CPU could understand it.

C, a high-level programming language, seems to be very popular today because it is small, so it is not too hard to learn, it is very efficient and portable so one can use it with all kinds of computers. A lot of software engineers use C to write commercial applications programs for mini, micro and personal computers. There are also various versions of C — C++ and Objective C, which represent a new style of programming.

At present there is a tendency towards an even higher level of programming languages, which might be called specification languages, and an increasing use of software development tools.

People communicate instructions to the computer in symbolic languages and the easier this communication can be made, the wider the application of computers will be. Scientists are reported to be already working on Artificial Intelligence and the next generation of computers may be able to understand human languages.

Упражнение 3. А. Прочитайте текст упражнения 2 и заполните пропуски словами.

programming	compiler	programmed	program	assembler	language
programmers	portable	low-level	machine code		

1. A computer ... is a set of instructions that tells the computer what to do. 2. Converting an algorithm into a sequence of instructions in a programming language is called 3. Most computer ... make a plan of the program before writing it. 4. Coding is the translation of the logical steps into a programming 5. In the next century computers will be ... in natural languages like English or French. 6. A ... is a special program that converts a program written in a high-level language into a program written in a lower level language. 7. It is difficult to use ... , which is the only language understood by the processor. 8. A special program called ... converts a program written in a low-level language into machine code. 9. If the same program can be used for different computers, it is called 10. In a ... language each instruction has a corresponding machine code equivalent.

В. Speak about:

The new programming language you have heard of or read about.

SUPPLEMENTARY TEXTS

To be read after Lesson 1

Education

Most Americans start to school at the age of five when they enter kindergarten. Children do not really study at this time. They only attend for half the day and learn what school is like. Children attend elementary school for next six years. They learn to read and write and work with numbers. They also study the world and its people. After they leave elementary school, children go to junior high school for three years and senior high school for another three years. This is called secondary education. In some places the children go to elementary school for eight years and high school for four. At any rate, elementary and secondary education together take twelve years to complete excluding kindergarten.

In their secondary schooling children get more advanced knowledge and begin to concentrate on their special interests. They usually study further in history, geography, government and English language and literature.

They may choose to study foreign languages, advanced mathematics or science, such as physics or chemistry. Students who plan to go on to college or professional training must take some of these courses in order to enter college. Other students who do not intend to go on with school may take classes in accounting or typing or other subjects that will help them in the business world. Some senior high schools are vocational. Boys may learn to operate machines or do other work. Girls may learn cooking, sewing or office work. High schools have athletic teams which play against teams from other schools. Many boys enjoy playing football, basketball or baseball. These games take place after school hours. Girls are given physical education too, but they do not usually play teams from another schools.

In the most places in the US children must attend school until they are sixteen, or until they finish high school, usually at the age of seventeen or eighteen. Some children who are not good students drop out of school at the age of sixteen. This is a growing problem, for it is harder and harder for people to find work when they have not finished their high school education.

Public schools are free for all boys and girls, but some parents prefer to send their children to private schools. Some private schools are connected with churches and children receive religious

instruction as well as their regular studies. Other private schools are not religious, but have small classes and very good teachers so that the parents think their children will get a better education there than in the larger classes of the public schools. The private schools do not receive any tax money, so most of them must charge the students several hundred dollars a year to pay for the cost of the school. Boys and girls attend the public schools together, but many private schools are for girls only or for boys only.

To be read after Lesson 2

The Trees Fell — So Did the People

Early civilisations may have killed themselves off by plundering (хищнически уничтожать) local plants and animals. New archeological findings suggest that far from living in perfect harmony with nature, prehistoric civilisation dealt major and sometimes fatal blow to natural surroundings. Many investigators now question the idea that environmental problems began only with the industrial revolution in the 19th century.

Long before the appearance of industrial civilization prehistoric societies were destroying (уничтожать) forests, plants, animals and farmland. Such destruction sometimes destroyed them in turn.

The mysterious disappearance of Anasasi Indians may be a dramatic example of this. In territories that are now New Mexico and Arizona the Indians built a complex of roads, irrigation systems and giant «houses» with 800 rooms and more. All were abruptly left by them around A.D. 1200. Until now, the majority of archeologists have believed that the reason was a prolonged drought (засуха), but by using an electron microscope to analyze the tree rings American scientists found that over two centuries or so the Indians were systematically deforesting the canyon where they lived until the forests' ability to replenish itself was destroyed.

Some Words About Words

With about 200,000 words in current usage English is generally regarded as the richest of the world's languages. Few other languages can match this word power. Chinese comes close. German has a vocabulary of only 184,000 words, and French has fewer than 100,000 words.

English owes its exceptionally large vocabulary to its ability to borrow and absorb words from outside. Atomic, jeans, khaki, sput-

nik, perestroika, glasnost are just a few of the many words that have come into use during this century. They have been taken or adopted from Italian, Hindi, Creek and Russian. The process of borrowing words from other languages has been going on for more than 1,000 years. When the Normans crossed over from France to conquer England in 1066, most of the English spoke old English or Anglo-Saxon — a language of about 30,000 words. The Normans spoke a language which was a mixture of Latin and French. It took about three centuries for the language to become one that is the ancestor of the English they speak today. The Normans gave us words such as «city», and «palace». The Anglo-Saxon gave us «ring and town».

Latin and Greek have been a fruitful source of vocabulary since the 16th century. The Latin word «mini», its opposite «maxi» and the Greek word «micro» have become popular adjectives to describe everything from bikes to fashion.

To be read after Lesson 3

Nuclear Power? Well, Yes

Although nuclear reactors have generated electricity commercially for more than 40 years and nearly 400 now in operation, two major accidents — in the US in 1979 and Chernobyl in the USSR in 1986 — have put the industry under a radioactive cloud. In the popular imagination, reactors are nuclear bombs; even if they don't explode, they go on accumulating waste that will finally cause a global catastrophe.

As a result, an energy source once considered as the fuel of the future became questionable. But not everywhere. Nuclear power provides nearly a quarter of the electricity generated in the industrialized Western world by the 24-member countries of the Organization for Economic Cooperation and Development. In France more than 76 % of electric power is nuclear-generated, in Belgium — 62 %, Sweden — 50 %, Germany, Switzerland, Spain and Finland come in at one third, Japan — a little less; Britain, the US and Canada — under 20 %. Some countries have no nuclear power plants at all and don't want any.

Not only the strong emotions of fear have worked against nuclear power. Energy demand grew more slowly than expected in the past decade. Prices of oil and coal have reduced. However, energy prices can rise. Moreover, supplies of fossil fuel are limited, while

energy needs and tide (прилив) can't meet the increasing requirements. Besides, nuclear power doesn't add to global warming.

All this causes the people to believe that the world can't live and work without nuclear power.

To be read after Lesson 4

Telecommunication

A group of people enter a room, the lights go down, the screens come... the videoconference is under way.

Tomorrow's scientific fiction has become today's new technology - a daily reality for global companies who recognise the importance of regular communication between groups of people in different locations around the world.

Essentially the videoconference room resembles a usual conference room. Delegates sit along one side of a table facing their colleagues on screen on the other side. They can see, hear and talk to each other simultaneously and can present slides of diagrams, even pieces of equipment. The technology is relatively simple. A device called videocodec takes the picture, digitalizes it for transmission over a special network and reforms the picture at the other end.

The problem today is to manufacture codec to the new international standard and to improve picture quality through faster transmission speeds. Research and development is also focusing on mobile videoconferencing with broadcast quality pictures which enable to have instant communication with colleagues around the world.

There is no doubt about the effectiveness of videoconferencing, as the videoconference eliminates the working time lost through travel.

The First Travelling Post Office

The first travelling post office in the United States was Abraham Lincoln's hat. That was a strange place, indeed, for mail; but that is where it was kept. Lincoln was appointed postmaster of New Salem, a small Western town, about the year 1833. The postman visited the place once a week and brought the mail — a dozen letters, perhaps, and two or three newspapers — in his saddle (седло) bags. He was always met by Postmaster Lincoln who put the letters into his hat for safekeeping. Lincoln was also the clerk in the country store, so he had a good opportunity to distribute the mail. But if

people did not come for it, he put on his hat and delivered it. So New Salem was the first town in the US to have rural free delivery, even though the postmaster received very small pay for his work. At that time, stamps and envelopes were not used. When the sender of a letter paid the postal charges, the postmaster wrote PAID in the large letters on the face of the letter. But the postal rates were so high that the sender seldom paid them. Thus, the mailing charges were usually collected from the person who received the mail. The postmaster always held his postal receipts until a government representative came for them.

The Internet

The Internet is a magnificent global network with millions and millions of computers and people connected to one another where each day people worldwide exchange an immeasurable amount of information, electronic mail, news, resources and, more important, ideas.

It has grown at a surprising rate. Almost everyone has heard about it and an increasing number of people use it regularly. The current estimate is that over 70 million people are connected, in some way, to the Internet — whether they know it or not.

With a few touches at a keyboard a person can get access to materials in almost everywhere. One can have access to full-text newspapers, magazines, journals, reference works, and even books. The Web is one of the best resources for up-to-date information. It is a hypertext-based system by which you can navigate through the Internet. Hypertext is the text that contains links to other documents. A special program known as «browser» can help you find news, pictures, virtual museums, electronic magazines, etc. and print Web pages. You can also click on keywords or buttons that take you to other pages or other Web sites. This is possible because browsers understand hypertext markup language or code, a set of commands to indicate how a Web page is formatted and displayed.

Internet Video conferencing programs enable users to talk to and see each other, exchange textual and graphical information, and collaborate.

Internet TV sets allow you to surf the Web and have e-mail while you are watching TV, or vice versa. Imagine watching a film on TV and simultaneously accessing a Web site where you get information on the actors of the film. The next generation of Internet-enabled televisions will incorporate a smart-card for

home shopping, banking and other interactive services. Internet-enabled TV means a TV set used as an Internet device.

The Internet is a good example of a wide area network (WAN). For long-distance or worldwide communications, computers are usually connected into a wide area network to form a single integrated network. Networks can be linked together by telephone lines or fibre-optic cables. Modern telecommunication systems use fibre-optic cables because they offer considerable advantages. The cables require little physical space, they are safe as they don't carry electricity, and they avoid electromagnetic interference.

Networks on different continents can also be connected via satellites. Computers are connected by means of a modem to ordinary telephone lines or fibre-optic cables, which are linked to a dish aerial. Communication satellites receive and send signals on a trans-continental scale.

To be read after Lesson 5

Harnessing (обуздание) the Speed of Light

When American engineer Alan Huang revealed his plans to build an optical computer, most scientists considered this idea as hopeless. It was impractical, if not possible, they said, to create a general-purpose computer that could use pulses of light rather than electrical signals to process data. During one of the scientist's lectures on the subject, a third of the audience walked out. At another one, some of the scientists laughed, calling the researcher a dreamer.

That was several years ago. Now the scientist demonstrated his experimental computing machine based on optics. It took him five years to develop it. The device — a collection of lasers, lenses and prisms — can serve as the basis for future optical computers 100 to 1,000 times as powerful as today's most advanced supercomputers. The potential applications are remarkable: robots that can see, computers that can design aircraft, processors that can convert spoken words into written text and vice versa. Such practical optical computers are still years away — some would say light-years.

Yet many scientists are predicting that the device will have an impact similar to that of the integrated circuit which made small personal computers possible.

Photons, the basic unit of light beams, can in theory be much better than electrons for moving signals through a computer. First of all, photons can travel about the times as fast as electrons. And

while electrons react with one another, beams of photons, which have no mass or charge, can cross through one another without interference. Thus, photons can move in free space. This could open the door to radically new and different computer designs, including so-called parallel processors that could work on more than one problem at a time instead of one after another, as today's new generation computers do.

How Transistors Work

Microprocessors are essential to many of the products we use every day such as TVs, cars, radios, home appliances and of course, computers. Transistors are the main components of microprocessors. At their most basic level, transistors may seem simple. But their development actually required many years of thorough research. Before transistors, computers relied on slow, inefficient vacuum tubes and mechanical switches to process information. In 1958, engineers put two transistors onto a silicon crystal and created the first integrated circuit that led to the microprocessor. Here on a tiny silicon chip there are millions of switches and pathways that help computers make important decisions and perform helpful tasks.

Transistors are miniature electronic switches. They are the building blocks of the microprocessor which is the brain of the computer. Similar to a basic light switch, transistors have two operating positions, on and off. This on/off function enables the processing of information in a computer.

The only information computers understand are electrical signals that are switched on and off. To understand how transistors work, it is necessary to have an understanding of how a switched electronic circuit works. Switched electronic circuits consist of several parts. One is the circuit pathway where the electrical current flows — typically through a wire. Another is the switch, a device that starts and stops the flow of electrical current by either completing or breaking the circuit's pathway. Transistors have no moving parts and are turned on and off by electrical signals. The on/off switching of transistors facilitates the work performed by microprocessors.

Something that has only two states, like a transistor, can be referred to as binary. The transistor's «on» state is represented by a 1 and the «off» state is represented by a 0. Specific sequences and patterns of 1's and 0's generated by multiple transistors can represent letters, numbers, colours and graphics. This is known as binary notation.

More complex information can be created such as graphics, audio and video using the binary, or on/off action of transistors.

Many materials, such as most metals, allow electrical current to flow through them. These are known as conductors. Materials that do not allow electrical current to flow through them are called insulators. Pure silicon, the base material of most transistors, is considered a semiconductor because its conductivity can be modulated by the introduction of impurities.

Adding certain types of impurities (примесь) to the silicon in a transistor changes its crystalline structure and improves its ability to conduct electricity.

The binary function of transistors gives microprocessors the ability to perform many tasks; from simple word processing to video editing. Microprocessors have developed to a point where transistors can carry out hundreds of millions of instructions per second on a single chip. Automobiles, medical devices, televisions, computers and even the Space Shuttle use microprocessors. They all rely on the flow of binary information made possible by the transistor.

To be read after Lesson 6

Ceramic Application

The application which has captured the imagination of engineers, as well as the general public, is certainly the ceramic engine, that is the adiabatic turbo-diesel engine and the ceramic turbine for automotive use. There are some successful phototypes on the road, however, applications on a large scale have been held back by problems of cost and reliability. Steady progress is being made in the increase of the reliability of ceramics. But the cost factor is likely to remain a problem for some time.

One should mention here that the long-term reliability in service still needs to be defined for those applications where the material must withstand very high temperatures and dynamically changing mechanical and thermal loads in a chemically aggressive environment.

Ceramic engines and turbines are but the top of the pyramid with respect to applications. At lower levels of performance there are numerous other applications, in which the operating conditions are less severe, for example, ceramic heat exchangers for chemical plants. Ceramics finds application in bearings and engine parts because of its high hardness and high abrasion resistance.

There are three main materials used in making pipes: metal, rubber and plastic.

Metal is stronger than rubber and plastic. It is also heavier and more rigid than rubber and plastic. Metal is the strongest material, but it is also the heaviest, and the most rigid. It is also the most expensive of the three materials.

Rubber is weaker than metal or plastic. It is also more flexible than the other two materials. Rubber is the most flexible of the three materials, but it is the weakest.

Plastic is lighter than metal. It is also less expensive than steel or rubber. Plastic is the lightest material. It is also the least expensive of the three materials.

Glass is used for making windows because you can see through it, and it is very hard and therefore cannot be cut easily. But at the same time it is very brittle and therefore it can break easily.

Wood is soft and therefore it can be cut easily. It can be used in fires because it is combustible.

Car tyres are made of rubber because rubber is flexible.

A car panel is made by three methods. First, sheet steel is made. This is done by pushing a piece of steel between two rollers, which squeeze the metal and make it longer and thinner. This method is called rolling. Not all metals can be rolled. For example, iron cannot be rolled because it is too brittle. But steel can be rolled because it is tough and malleable (ковкий) enough.

Next, the steel is cut into a flat shape. This is done by placing the sheet onto a die, and then cutting a hole in it with a punch. The method is called punching. The steel can be cut easily because it is now very thin.

Finally, the sheet steel is bent and pressed into a rounded shape. This is done by putting the sheet onto a die and then bending the sheet around the die with a press. This method is called pressing. It is not difficult to press sheet steel because it is thin and malleable.

To be read after Lesson 7

Electric Car

The electric car is not a new idea. It had success with American women in the early 1900s. Women liked electric cars because they were quiet and, what was more important, they did not pollute the

air. Electric cars were also easier to start than gasoline-powered ones. But the latter was faster, and in the 1920s they became much more popular.

The electric car was not used until the 1970s, when there were serious problems with the availability of oil. The General Motors Co. had plans to develop an electric car by 1980. However, soon oil became available again, and this car was never produced.

Today there is a new interest in the electric car. The Toyota Co. recently decided to spend \$800 million a year on the development of new car technology. Many engineers believe that the electric car will lead to other forms of technology being used for transportation.

Car companies are working at developing a supercar. A super-efficient car will have an electric motor. Four possible power sources are being investigated. The simple one is batteries. Another possibility is fuel cells, which combine oxygen from air with hydrogen to make electricity. Yet another approach would be a flywheel (маховик), an electric generator consisting of free-spinning wheels with magnets in the rims that can produce a current. A fourth possible power source for the super-car would be a small turbine engine, running on a clean fuel like natural gas. It would run at a constant speed, generating electricity for driving vehicles or for feeding a bank of batteries, storing energy for later use.

Engines

Do you know what the first engine was like? It was called the «water wheel». This was an ordinary wheel with blades fixed to it, and the current of a river turned it. These first engines were used for irrigating fields.

Then a wind-powered engine was invented. This was a wheel, but a very small one. Long wide wooden blades were attached to it. The new engine was driven by the wind. Some of these ones can still be seen in the country.

Both of these, the water- and wind-operated engines are very economical. They do not need fuel in order to function. But they are dependent on the weather.

Many years passed and people invented a new engine, one operated by steam. In a steam engine, there is a furnace and a boiler. The furnace is filled with wood or coal and then lit. The fire heats the water in the boiler and when it boils, it turns into steam which does some useful work.

The more coal is put in the furnace, the stronger the fire is burning. The more steam there is, the faster a train or a boat is moving.

The steam engine drove all sorts of machines, for example, steam ships and steam locomotives. Indeed, the very first aeroplane built by A.F. Mozhaisky also had a steam engine. However, the steam engine had its disadvantages. It was too large and heavy, and needed too much fuel.

The imperfections of the steam engine led to the design of a new type. It was called the internal combustion engine, because its fuel ignites and burns inside the engine itself and not in a furnace. It is smaller and lighter than a steam engine because it does not have a boiler. It is also more powerful, as it uses better-quality fuel: petrol or kerosene.

The internal combustion engine is now used in cars, diesel locomotives and motor ships. But to enable aeroplanes to fly faster than the speed of sound another, more powerful engine was needed. Eventually, one was invented and it was given the name «jet engine». The gases in it reach the temperature of over a thousand degrees. It is made of a very resistant metal so that it will not melt.

To be read after Lesson 8

The Driving Lesson

Miss Green: Good afternoon. My name is Miss Green and I'm your driving instructor. Is this your first lesson?

Simon: It is my first lesson at this driving school.

M. G.: Oh, you've been to another one?

S.: Yes. The Greenwich school of driving. But I stopped going there.

M. G.: Why? Weren't the lessons good enough?

S.: They were good but my instructor left.

M. G.: Really? Well, let's see what you can do. I want you to drive down this road and turn left at the end.

S.: Yes, all right.

M. G.: You drive very well! I'm sure you'll pass your test. All my pupils pass their tests. Oh, look out! That lorry!

S.: You said turn left at the end.

M. G.: When you want to turn a corner, slow down and look first. You nearly hit that lorry. Please, be careful. Now turn right at the traffic lights... Right, not left!

S.: Sorry it was too late. I've turned left now.

M. G.: Didn't you see the No Entry sign? This is a one-way street.

S.: Why are those drivers shouting?

M. G.: Because you're driving the wrong way down a one-way street. Stop the car, please, and turn it round.

S.: I'm not very good at that.

M. G.: Mind that red car!

S.: Madman! He nearly hit me!

M. G.: He was right and you were wrong. Why didn't you wait? Now you are blocking the road. You want reverse gear. Turn the wheel ... more ... more ... Not too fast! Oh, what have you done now?

S.: It is all right. I went into the lamp-post but it is still standing. I didn't knock it down.

M.G.: Oh, but look at the back of the car.

S.: Sorry, but you said «reverse».

M.G.: I didn't say «drive into the lamp-post». Well, you've turned the car round now, so drive back to the traffic lights and go straight across.

S.: Are we going to the park?

M.G.: The roads are quiter near the park. Oh, not too fast!

S.: The lights are green.

M.G.: Slow down! The lights are changing!

S.: I can't slow down. There! We are across.

M.G.: The lights were red!

S.: It's all right. There were no policemen.

M.G.: I know why your last instructor left. He wanted to stay alive.

S.: That's not a very nice thing to say. And it's not true. He left because he wasn't very well.

M.G.: Stop the car, please. Oh, gently!

S.: Sorry. Did you hit your head on the roof?

M.G.: No. Luckily I was wearing the seat belt. Now I want you to practise driving backwards. Reverse the park gates. Look first, than reverse in.

S.: Right.

M.G.: Oh, you've hit the gate!... Now you are driving on the grass!

S.: I'm going backwards down the hill and I can't stop! Help me!

M.G.: Use the brakes! Don't drive into the lake!

S.: Too late.
M.G.: Look what you've done. You reversed into a lamp post. You hit the park gate. Now you've driven into the lake. Oh, why didn't you stay with the other driving school?
S.: They had no more cars left.

Heavy-Lift Dirigible

Unlike other new dirigible projects the giant CargoLifter CL 160 (Germany) is aimed at heavy-lift cargo applications, not at tourism or advertising. It will be the beginning of a new era in freight transport.

The 260-meter-long, 65-meter-diameter semi-rigid airship will be capable of transporting 160 ton loads-equivalent to 36 standard 40-ft containers — to out-of-the-way (remote) construction sites 10,000 km away. With a cruise speed of just 80–120 km/hr the CL 160 would not get the load to its destination nearby as fast as a heavier-than-air craft such as Antonov An-124, but it would also not require the landing facilities needed for the unusually large aircraft.

Moored (причаливать) above the delivery site, the airship will lower loads using an onboard crane without actually having to touch down. A crew of five, including navigator and two cargo-masters (высококвалифицированные рабочие) would man the ship.

In fact, the CargoLifter project was born of a logistics need expressed by manufacturers of electric generators, turbines and other outsized (i.e., larger than the usual size) machinery.

Rolls-Royce-Turbomeca turboshaft engines are to be used for maneuvering the big airship, cruise being provided by diesel power-plants.

What Is GPS?

The Global Positioning System (GPS) is a satellite-based navigation system made up of a network of 24 satellites. GPS was originally intended for military applications, but now the systems is available for civilian use. GPS works in any weather conditions, anywhere in the world, 24 hours a day.

GPS satellites circle the earth twice a day in a very precise orbit and transmit signal information to Earth. GPS receivers take this information and use triangulation to calculate the user's exact location. Essentially, the GPS receiver compares the time a signal

was transmitted by a satellite with the time it was received. The time difference tells the GPS receiver how far away the satellite is. Now, with distance measurements from a few more satellites, the receiver can determine the user's position and display it on the unit's electronic map.

A GPS receiver must be locked on to the signal of at least three satellites to calculate a 2D position (latitude and longitude) and track (проследивать) movement. With four or more satellites in view, the receiver can determine the user's 3D position (latitude, longitude and altitude). Once the user's position has been determined, the GPS unit can calculate other information, such as speed, bearing (пеленг), track, trip distance, distance to destination, sunrise and sunset time and more.

Today's GPS receivers are extremely accurate within an average of three to five meters thanks to their parallel multi-channel design.

The 24 satellites that make up the GPS space segment are orbiting the earth about 12,000 miles above us. They are constantly moving, making two complete orbits in less than 24 hours. These satellites are travelling at speeds of roughly 7,000 miles an hour.

GPS satellites are powered by solar energy. They have backup batteries onboard to keep them running in the event of a solar eclipse (затмение), when there's no solar power. Small rocket boosters on each satellite keep them flying in the correct path.

Here are some other interesting facts about the GPS satellites:

1. The first GPS satellite was launched in 1978.
2. A full constellation (созвездие) of 24 satellites was achieved in 1994.
3. Each satellite is built to last about 10 years. Replacements are constantly being built and launched into orbit.
4. A GPS satellite weighs approximately 2,000 pounds and is about 17 feet across with the solar panels extended.
5. Transmitter power is only 50 watts or less.

GPS satellites transmit two low power radio signals. The signals travel by line of sight, meaning they will pass through clouds, glass and plastic but will not go through most solid objects such as buildings and mountains.

A GPS signal contains three different bits of information — a pseudorandom code, ephemeris data and almanac data.

Some factors that can degrade the GPS signal and thus affect accuracy include the following:

1. The satellite signal slows as it passes through the atmosphere.

2. The GPS signal is reflected off objects such as tall buildings or large rock surfaces before it reaches the receiver. This increases the travel time of the signal, thereby causing errors.

3. A receiver's built-in clock is not as accurate as the atomic clocks onboard the GPS satellites. Therefore, it may have very slight timing errors.

4. The more satellites a GPS receiver can «see,» the better the accuracy. Buildings, terrain, electronic interference, or sometimes even dense foliage (листва) can block signal reception, causing position errors or possibly no position reading at all. GPS units typically will not work indoors, underwater or underground.

To be read after Lesson 9

Getting into Deep Water

The dark depths of the Gulf of Mexico, once frequented by only the sea creatures, are now alive with human activity. Miniature submarines and robot-like vehicles move around the ocean bottom while divers make their way around incredible underwater structures — taller than New York City skyscrapers, but almost totally beneath the surface of the waves. Modern-day explorers are using technology worth of Jules Verne and Jacques Cousteau to find fresh supplies of oil and natural gas.

Until recently, drilling in the Gulf was concentrated close to shore in water as deep as 9 m. But now the scientists are looking to hundreds of meters deep and 160 km and more from land.

The deep water research began in 1984. Since then many American companies have built the world's deepest production platforms of more than 100 storeys high. Finding gas and oil deposits at large depth is not an easy technological task.

Voyage to the Bottom of the Sea

There is an American project of one-person submarine, which will «fly» to the bottom on inverted wings rather than simply sinking under its own weight as the bathyscaphes did. This design is more like an aeroplane than a balloon. It could one day make exploring the ocean depth as easy as flying a plane is today.

The most difficult problem is to find a material that is also light enough to allow the craft to float back to the surface if there is a loss of power or some other emergency. Alumina, a hard ceramic, was chosen for the vessel.

The pilot's capsule is about a meter in diameter, 5 centimeters thick and about 2 meters long. It is capped at one end with a ceramic hemisphere and at the other with a glass viewing dome. The rest of the craft, including the wings on either side and the casing at the rear for the motors, are made of a lightweight composite material.

In addition to the pilot, the pressure vessel houses the controls and instrument panel, the life-support system and a 24-volt power supply. The pilot effectively operates the craft by radio control.

The batteries feed a pair of electric motors that can drive the craft at up to 14 knots (25 kilometers per hour). The craft could dive vertically but this would be uncomfortable for the pilot who lies face downwards in the cylindrical chamber. So it descends at an angle of up to 45°. «Deep Flight» is designed to be as streamlined as possible. This means making the submarine's cross section as small as possible and providing as little equipment as possible on the hull.

At a cruising speed of 10 knots «Deep Flight» will descend at a rate of 200 meters per minute and reach 11,000 meters in about an hour in the Mariana Trench (Марианская впадина), the deepest site on Earth. The weight of the craft is 2.5 tonnes, which is about the same as a large car. This will allow it to be launched from any vessel.

To be read after Lesson 10

Laser Technology

In the last decade there was outstanding progress in the development of laser technology and its application in science, industry and commerce. Laser cutting, welding and machining are beginning to be big business. The market for laser systems represents around 2.5 % of the world machine tool market.

Which country is the biggest producer and consumer of lasers? Why, Japan, naturally: Japan produced 46 % of world's lasers in 1989, while figures for Europe and the USA are 32 % and 22 %. Japan is building 1,200 to 2,000 CO₂ lasers per year of which some 95 % are over 500 W power and 80 % of them are used for cutting operations.

Europe is the second largest user and the third largest producer. In 1990 Europe's market for lasers was \$128 million, of which Germany consumed about \$51 million, and Italy — \$12 million.

The Germany met 90 % of its demands through domestic producers. Growth rate of the European market is estimated at 10 to 15 % per year.

In the future the main trend influencing the industry will be laser source prices. The prices are dropping. There appear lasers of modular construction. The complexity of laser machines is rising. Multi-axes systems are in more use now. Recently a 7-axis CNC laser machining center has been introduced. In addition to X,Y and Z axes, there are two rotary axes, A and C, and two more linear axes, U and V, to give a trepanning (прорезать большие отверстия) motion to the laser.

Optical Disks and Drives

Optical disks can store information at much higher densities than magnetic disks. Thus, they are ideal for multimedia applications where images, animation and sound occupy a lot of disk space. Besides, they are not affected by magnetic fields. This means that they are secure and stable, e.g. they can be transported through airport metal detectors without damaging the data. However, optical drives are slower than hard disks. While there are hard drives with an average access time of 8 milliseconds (ms), most CD-ROM drives have an access time of 150 to 20 ms.

There are various types of optical drives, which have become a reality. CD-ROM systems use optical technology. The data is retrieved using a laser beam. To read CD-ROM disks, you need an optical drive (a CD-ROM player). A typical CD-ROM disk can hold 650 MB (megabytes) of sound, text, photographs, music, multimedia materials and applications. In addition, most CD-ROM drives can be used to play audio CDs. Do you remember that CD stands for compact disk?

Yet CD-ROM technology has one disadvantage. The data on a CD-ROM cannot be changed or «written» to, i.e. it is impossible to add your own material to what is on the disk. It is like a music CD. It is not designed for you to write on, it is designed to hold a lot of information that the user doesn't need to change.

Magneto-optical (MO) drives use both a laser and an electromagnet to record information. Consequently, MO disks are rewritable, that is they can be written to, erased, and then written again. They are available in two formats. Their capacity may be more than 2 GB (gigabyte) or 230 to 640 MB. Such combined devices are good for back up purposes and storage of large amounts of information such as a dictionary or encyclopaedia.

Space Cooling

A new method of cooling that can generate cryogenic temperatures of 200 °C below zero without the use of electricity and with almost no moving parts has been tested at the Jet Propulsion Laboratory in Pasadena, California. The refrigerator used for the purpose was recently tested to — 253 °C, only 20 degrees above absolute zero, the lowest possible temperature.

In space such cooling system could increase the life of future space station refuelling ports by cooling the large liquid-hydrogen fuel tanks which are likely to be in service.

In future earth applications it could be used for cooling hydrogen-powered cars and planes, as well as for cooling superconducting motors and computers.

According to the JPL (Jet Propulsion Laboratory) experts the key lies in the use of hydrides, materials that interact with hydrogen. These materials absorb tremendous amounts of hydrogen gas at room temperature. The engineers of the JPL have taken advantage of this property to build a series of devices that act as compressors and provide a continuous cooling stream of liquid hydrogen.

The system saves weight in space since it can use direct solar heat instead of electricity from heavier, inefficient electric systems. Because it has so few moving parts and uses the same supply of gas in a closed cycle, it could operate for many decades. Because of its long potential lifetime, the system could be used to cool infrared sensors during missions to the other planets, which may take 10 years or more to complete.

The Propulsion Challenge¹

Magsails are a form of solar sails that use a completely different type of physical interaction with the Sun. Magsail is a simple loop (петля, контур) of high-temperature superconducting wire carrying a persistent² current. The charged particles in the solar wind are deflected³ by the magnetic field, producing thrust. Although the thrust density in the solar ion wind flux is 5,000 times less than the thrust density in the solar photon flux⁴, the mass of a solar sail goes directly with the area, whereas the mass of the magsail rises with the perimeter of the enclosed area.

The effective cross-sectional area of the magnetic field around the magsail is about a hundred times the physical area of the loop. As a result, preliminary calculations show the thrust-to-weight ra-

tio of a magsail can be an order of magnitude (порядок величины) better than a solar sail. Recent thermal balance calculations indicate that a properly Sun-shielded⁵ cable can be passively maintained at a temperature of 65 K in space, well below the superconducting transition point for many of the new high temperature superconductors.

Notes to the Text

1. problem, difficulty, invitation to see which is better
2. continuing
3. cause to turn away from
4. flow
5. protected

Computer Graphics

Computer graphics are known to be pictures and drawings produced by computers. A graphics program interprets the input provided by the user and transports it into images that can be displayed on the screen, printed on paper or transferred to microfilm. In the process the computer uses hundreds of mathematical formulas to convert the bits of data into precise shapes and colours. Graphics can be developed for a variety of uses including illustrations, architectural designs and detailed engineering drawings.

Mechanical engineering uses sophisticated programs for applications in computer-aided design (CAD) and computer-aided manufacturing (CAM). In the car industry CAD software is used to develop, model and test car designs before the actual parts are made. This can save a lot of time and money.

Basically, computer graphics help users to understand complex information quickly by presenting it in more understandable and clearer visual forms. Electric engineers use computer graphics for designing circuits and in business it is possible to present information as graphics and diagrams. These are certain to be much more effective ways of communicating than lists of figures or long explanations.

Today, three-dimensional graphics along with colour and computer animation are supposed to be essential for graphic design, computer-aided engineering (CAE) and academic research. Computer animation is the process of creating objects and pictures which move across the screen; it is used by scientists and engineers to analyze problems. With appropriate software they can study the structure of objects and how it is affected by particular changes.

A graphic package is the software that enables the user to draw and manipulate objects on a computer. Each graphic package has its own facilities, as well as a wide range of basic drawing and painting tools. The collection of tools in a package is known as a palette. The basic geometric shapes, such as lines between two points, arcs, circles, polygons, ellipses and even text, making graphical objects are called «primitives». You can choose both the primitive you want and where it should go on the screen. Moreover, you can specify the «attributes» of each primitive, e.g., its colour, line type and so on. The various tools in a palette usually appear together as pop-up icons in a menu. To use one you can activate it by clicking on it.

After specifying the primitives and their attributes you must transform them. Transformation means moving or manipulating the object by translating, rotating and scaling the object.

Translation is moving an object along an axis to somewhere else in the viewing area. Rotation is turning the object larger or smaller in any of the horizontal, vertical or depth direction (corresponding to the x, y and z axis). The term «rendering» describes the techniques used to make your object look real. Rendering includes hidden surface removal, light sources and reflections.

To be read after Lesson 12

The Space Age

Russia was the first nation into space and is recognized as the world's leader in building space stations and conducting long-duration space missions. Since Yury Gagarin's epic flight Russian space science and engineering have come a long way. Space technology remains Russia's deepest source of pride (гордость). Russia has launched a great number of space vehicles designed to perform a variety of functions. Unmanned satellites have been of great significance in the exploration and peaceful use of outer space. They help us learn more about the relations between processes occurring on the sun and near the earth and study the structure of the upper atmosphere. These satellites are provided with scientific equipment for space navigation of civil aviation and ships, as well as exploration of the World Ocean, the earth's surface and its natural resources.

In April 1971, history's first space station, Salyut 1, was launched and over the next 15 years six its subsequent versions operated in space. Many orbital manned flights were performed

aboard these stations involving a lot of cosmonauts, most of them having flown several times. Russian cosmonauts are known to hold the record for the longest time in space (L. Kizim has worked 375 days) and for continuous stay in space (V. Titov and M. Manarov — 365 days, i.e. a year). The knowledge of Russian doctors and researchers about the medical and psychological consequences of longterm space flight far exceed that of American scientists. In 1973, two years after Salyut 1, the United States launched Skylab, the Western World's first space station which was used for three highly successful missions. All these manned missions paved the way for even longer stays aboard the Russian Mir space station and, then, aboard the International Space Station.

The most successful Mir space station was launched in February 1986. It was expected to have a lifetime of only five years but it had been in orbit for 15 years before its controlled re-entry into the atmosphere. This space station was equipped with an astronomical observatory module named Kwant. It incorporated all the novelty that could be offered by designers and engineers. To keep productivity high, Russian designers paid much attention to the space station livability. The interior of Mir was painted in two colours to provide the crew with a sense of floor and ceiling. On Mir cosmonauts got two days off each week and had a special radio so that they could talk to their families and with any sportsman, scientist or celebrity they wanted.

With the twin Vega space probes being successfully launched in 1986, Russian scientists conducted close-range studies of Halley's comet and gathered impressive scientific data about Venus. Vega 1 and Vega 2 carrying more than 30 research instruments passed within 10,000 kilometers of the comet's heart, transmitted high-quality pictures to Earth and revealed for the first time the dimensions and dynamics of its ten-mile-long nucleus. The relative speed of approaching the comet was equal to 78 km/sec. It should be pointed out that the study of Halley's comet was conducted on the basis of extensive cooperation of scientists. Scientists from nine countries, including the U.S., joined the Vega project.

When the 170-million horse power launch vehicle called «Energia» was successfully tested in 1987, Russia has gone far ahead of the United States in the space race. With the new multi-purpose Energia rocket it became possible to put into orbit a 100-ton payload (one must know that the first satellite carried 83,6 kg).

The first International Space Station components, Zarya and Unity, have opened a new era of space exploration. The three-stage

Russian Proton booster was used to launch the Zarya module. The rocket was designed by the Salyut Design Bureau and is manufactured by the Khrunichev State Research and Production Space Centre in Moscow. The Proton is among the most reliable heavy-lift launch vehicles in operation with its reliability rating about 98 per cent. Proton measures about 180 feet tall, 24 feet in diameter at its widest point and weighs about 1,540,000 pounds when fully fueled for launch. The engines use nitrogen tetroxide, an oxidizer, and dimethyl hydrazine, a fuel, as propellants. The first stage includes six engines providing about 1.9 million pounds of thrust at launch. Four engines creating 475,000 pounds of thrust power the Proton's second stage. The Proton's third and final stage is powered by a single engine that creates 125,000 pounds of thrust.

Assembling the station will be unprecedented task, turning the Earth orbit into a constantly-changing construction site. More than 100 elements will be joined over the course of 45 assembly flights using the Space Shuttle and two types of Russian rockets. An international team of astronauts and cosmonauts will do much of the work by hand, performing more space works in just five years than have been conducted throughout the history of space flight. They will be assisted by a new generation of robotic arms, hands and perhaps even free-flying robotic «eyes».

The international partners, Canada, Japan, the European Space Agency, are supposed to contribute the following key elements to the ISS: Canada is to provide a robotic arm to be used for assembly and maintenance tasks on the station. The European Space Agency is building a pressurized laboratory to be launched on the Space Shuttle. Japan is building a laboratory module with an attached platform where experiments can be exposed to space as well as logistics transport vehicles.

Scientists believe the ISS to be the most advanced base for developing technologies, systems and procedures to enable safe, efficient and permanent human presence in space.

Cryptography

From e-mail to cellular communications, from secure Web access to digital money, cryptography is an essential part of today's information systems. The only way to protect a message is to encode it with some form of encryption. Data encryption is very important for network security, particularly when sending confidential information. Encryption is the process of encoding data so that unauthorized users can't read it. Decryption is the process of decod-

ing encrypted data transmitted to you. The most common methods of protection are passwords for access control, encryption and decryption systems, and firewalls. Firewall is a software and hardware device that allows limited access to an internal network from the Internet.

Cryptography helps provide accuracy and confidentiality. It can prove your identity or protect your anonymity. It can prevent vandals from changing your Web page and industrial competitors from reading your confidential documents. And in the future, as commerce and communications continue to move to computer networks, cryptography will become more and more vital.

But the cryptography now on the market does not provide the level of security it advertised. Most systems are not designed and implemented together with cryptographers. Present-day computer security is a house of cards; it may stand for now, but it can't last. Electronic vandalism is an increasingly serious problem. Computer vandals take advantage of technologies newer than the system they attack, using techniques the designers never thought of and even invent new mathematics to attack the system with.

No one can guarantee 100 % security. But we can work toward 100 % risk acceptance. Fraud (обман) exists in current commerce systems. Yet these systems are still successful, because the benefits and conveniences are greater than the losses. Some systems are not perfect, but they are often good enough. A good cryptographic system provides a balance between what possible and what is acceptable.

The good news about cryptography is that we already have the algorithms and protocols we need to secure our systems. The bad news is that that was the easy part; implementing the protocols successfully requires considerable expertise. Thus, there is an enormous difference between a mathematic algorithm and its concrete implementation in hardware and software.

Design work is the main support of the science of cryptography and it is very specialized. Cryptography combines several areas of mathematics: number theory, complexity theory, information theory, probability theory, abstract algebra, and formal analysis, among others. Unfortunately, few can do the science properly, and a little knowledge is a dangerous thing: inexperienced cryptographers almost always design imperfect systems. Quality systems use published and well-understood algorithms and protocols. Besides, only when cryptography is designed with careful consideration of users' needs and then integrated, can it protect their systems, resources, and data.

КРАТКИЙ ПОУРОЧНЫЙ ГРАММАТИЧЕСКИЙ СПРАВОЧНИК

LESSON 1

§ 1. Глагол **to be**

Глагол **to be** в Present, Past и Future Indefinite (Simple) имеет следующие формы:

Личное местоимение	Present	Past	Future
I	am	was	shall (will) be
{ he she it }	is	was	will be
we	are	were	shall (will) be
{ you they }	are	were	will be

В вопросительной форме глагол **to be** ставится перед подлежащим:

Are they students?

Они студенты?

Where **were** you yesterday?

Где вы были вчера?

В отрицательной форме после глагола **to be** ставится отрицание **not**:

They **are not** in the library.

Они не в библиотеке.

§ 2. Глагол **to have**

Глагол **to have** в Present, Past и Future Simple имеет следующие формы:

Личное местоимение	Present	Past	Future
I	have	had	shall have
{ he she it }	has	had	will have
we	have	had	shall have
{ you they }	have	had	will have

Вопросительная форма глагола **to have** образуется двумя способами:

- 1) путем постановки глагола **to have** перед подлежащим:
Have you a dictionary? У Вас есть словарь?
- 2) с помощью вспомогательного глагола **to do**:
Do you have a dictionary? У Вас есть словарь?

Отрицательная форма глагола **to have** также образуется двумя способами:

- 1) с помощью отрицательного **no** перед существительным:
I have no dictionary У меня нет словаря.
- 2) с помощью вспомогательного глагола **to do**:
I do not have a dictionary У меня нет словаря.

§ 3. Оборот **There + be** в Simple Active

Число	Present	Past	Future
Единственное	there is	there was	there will be
Множественное	there are	there were	there will be

Оборот **there + be** переводится *есть, находится, имеется, существует*. Перевод предложений с оборотом **there + be** следует начинать с обстоятельства места или со сказуемого, если обстоятельство отсутствует. Слово **there** — вводная частица — на русский язык не переводится. Например:

There is a large reading room in this library.	В этой библиотеке большой читальный зал.
There are many methods of doing it.	Существует много способов сделать это.
There will be meeting tomorrow	Завтра будет собрание.

§ 4. Личные и притяжательные местоимения (Personal and Possessive Pronouns)

В английском языке личные местоимения имеют два падежа: именительный (nominative) и объектный (objective). Личные местоимения в именительном падеже употребляются в предложении в качестве подлежащего; личные местоимения в объектном падеже употребляются в предложении в качестве дополнения (прямого, косвенного или предложного).

Существуют также соответствующие притяжательные местоимения и их абсолютные формы. Притяжательные местоимения служат определениями к существительным. Если возникает необходимость употребить притяжательные местоимения без существительного, то употребляется специальная форма, которая называется абсолютной формой.

Личные местоимения		Притяжательные местоимения	Абсолютные формы
Именительный падеж	Объектный падеж		
I я	me меня, мне	my мой, моя, мое, мои	mine мой, моя, мое, мои
you ты, Вы	you тебя, Вас, тебе, Вам	your твой(-я), Ваш(-а), (-е)	yours твой(-я), Ваш(-а)
he он	him его, ему	his его	his его
she она	her ее, ей	her ее	hers ее
it он, она, оно	it его, ее, ему, ей	its его, ее	its — его, ее
we мы	us нас, нам	our наш(-а), (-е), (-и)	ours наш(-а), (-е), (-и)
you вы	you вас, вам	your ваши	yours ваши
they они	them их, им	their их	theirs их

Объектный падеж личных местоимений соответствует винительному и дательному падежам в русском языке.

Местоимения в объектном падеже с предлогами соответствуют в русском языке местоимениям в косвенных падежах без предлогов и с предлогами:

I asked **him** to come and see **me**.

She told **me** to bring the book to **her**.

Я попросил **его** прийти и навестить **меня**.

Она сказала **мне** принести книгу **ей**.

They went to the laboratory and
we went **with them**.
That is **her** book, not **yours**.
Here is **your** notebook.
I cannot find **mine**.

Они пошли в лабораторию и
мы пошли вместе с **ними**.
Это **ее** книга, не **ваша**.
Вот **твоя** тетрадь.
Я не могу найти **мою**.

§ 5. Времена группы Simple Active

Времена группы Simple обозначают факт совершения действия в настоящем, прошедшем и будущем без уточнения, как оно протекает во времени.

The Present Simple Tense (Настоящее неопределенное время)

The Present Simple Tense выражает обычное, повторное действие. Часто употребляется со словами **always** *всегда*, **usually** *обычно*, **every day (week, year)** *каждый день (неделю, год)* и т. д.:

We live in Moscow.

Мы живем в Москве.

Утвердительная форма глагола в **the Present Simple Tense** совпадает с инфинитивом без частицы **to**:

to study — учиться;

I study — я учусь.

В 3-м лице единственного числа к глаголу добавляется окончание **-s (-es)**:

to speak — he speaks, to see — she sees, to wash — she washes,
to dress — she dresses, to do — he does, to pay — he pays, to study
— he studies.

Вопросительная и отрицательная формы глагола в **the Present Simple** образуются с помощью вспомогательного глагола **to do** в форме **do** и **does** (для третьего лица единственного числа) и смыслового глагола в инфинитиве без частицы **to**. В вопросительном предложении вспомогательный глагол выносится перед подлежащим, а в отрицательном — стоит после подлежащего и между ним и смысловым глаголом ставится отрицательная частица **not**:

Do you study English?

Вы изучаете английский?

Does he study English?

Он изучает английский?

We **do not** study English.

Мы не изучаем английский.

He **does not** study English.

Он не изучает английский.

The Past Simple Tense (Прошедшее неопределенное время)

The Past Simple Tense выражает действие в прошлом и обычно употребляется со словами **yesterday** *вчера*, **the day before yesterday** *позавчера*, **last year, month, week** *в прошлом году, месяце, неделе*, **ago** *тому назад*, **the other day** *на днях*.

Правильные глаголы образуют утвердительную форму в **the Past Simple** путем прибавления окончания **-ed** к инфинитиву без частицы **to** для всех лиц единственного и множественного числа: to ask — asked, to study — studied. Например:

He **entered** the Moscow University last year.

Он поступил в МГУ в прошлом году.

Утвердительная форма неправильных глаголов в **the Past Simple** образуется особым способом и для каждого глагола приведена в таблице неправильных глаголов (см. приложение 10). Вопросительная и отрицательная формы в **the Past Simple** образуются с помощью вспомогательного глагола **did** для всех лиц и чисел:

Did he enter the Moscow University last year?

Он поступил в МГУ в прошлом году?

He **didn't enter** the Moscow University last year.

Он не поступил в МГУ в прошлом году.

The Future Simple Tense (Будущее неопределенное время)

The Future Simple Tense выражает будущее действие со словами **tomorrow** *завтра*, **the day after tomorrow** *послезавтра*, **tonight** *сегодня вечером*, **next year, month, week** *в следующем году, месяце, неделе*, **in ... days (hours)** *через ... дней (часов)* и т.д.

Утвердительная форма в **the Future Simple** образуется при помощи вспомогательных глаголов **shall** (для первого лица единственного и множественного числа) и **will** (для всех других лиц) и инфинитива глагола без частицы **to**:

I **shall** go to the library tomorrow.

Завтра я пойду в библиотеку.

He **will** go to the library next week.

Он пойдет в библиотеку на следующей неделе.

Вопросительная форма глагола в **the Future Simple** образуется путем вынесения вспомогательного глагола **shall** или **will** перед подлежащим:

Shall we go to the library to-morrow?	Мы пойдем завтра в библиотеку?
Will he go to the library next week?	Он пойдет в библиотеку на следующей неделе?

Отрицательная форма глагола в **the Future Simple** образуется при помощи отрицательной частицы **not**, которая ставится после вспомогательного глагола **shall** или **will**:

We shall not go to the library tomorrow.	Мы не пойдем в библиотеку завтра.
He will not go to the library next week.	Он не пойдет в библиотеку на следующей неделе.

Глаголы в **the Present, Past** и **Future Simple** переводятся как совершенным, так и несовершенным видом глагола в настоящем, прошедшем и будущем времени соответственно.

The Simple (Active)

Present	Past	Future
<i>Утвердительная форма</i>		
{I, we, you, they} write {he, she, it} writes	I, he, she, it, we, you, they } wrote	{I, we} shall write he, she, it, } will write you, they }
<i>Вопросительная форма</i>		
Do {I, we, you } they } write? Does {he, she, } it }	Did {I, you, } he, she, } write? it, we, } they }	Shall {I, we} write? Will {he, she, } it, you, } write? they }
<i>Отрицательная форма</i>		
I, we, } you, } do not write they } he, she, } it } does not write	I, he, she, } it, we, } did not write you, they }	{I, we} shall not write he, she, } it, you, } will not write they }

§ 6. Порядок слов в утвердительном, вопросительном и отрицательном предложениях

Отличительной чертой английского языка является твердый порядок слов в предложении. В английском языке твердый порядок слов имеет большое значение, так как он является одним из основных способов выражения отношений между словами в предложении, члены которого часто определяются только по занимаемому ими месту в предложении.

Порядок слов в утвердительном предложении таков: подлежащее, сказуемое, дополнение и обстоятельства (при наличии косвенного дополнения оно стоит после прямого). Обстоятельства места и времени могут быть также и перед подлежащим. Определение, выраженное прилагательным или местоимением, всегда стоит перед определяемым им существительным.

Порядок слов в предложениях

Вопросительное слово	Вспомогательный глагол	Подлежащее	Сказуемое	Дополнение	Обстоятельство
—	—	My friend	studies	English	at the institute.
—	Does	my friend	study	English	at the institute?
Where	does	my friend	study	English?	—
—	—	My friend	does not study	English	at the institute.

В английском языке существуют два основных типа вопросов: общие и специальные.

Общие вопросы требуют ответа «да» или «нет» и начинаются с глаголов **to have**, **to do**, **to be** или модальных глаголов:

Have you a dictionary?

Yes, I have. No, I have not.

Are you busy now?

Yes, I am. No, I am not.

Can you speak English?

Yes, I can. No, I cannot.

Do you study at the University?

Yes, I do. No, I don't.

У тебя есть словарь?

Да, есть. Нет, нету.

Вы заняты сейчас?

Да, занят. Нет, не занят.

Вы умеете говорить по-английски?

Да, я умею. Нет, не умею.

Вы учитесь в Университете?

Да, я учусь. Нет, я не учусь.

Специальные вопросы ставятся к какому-либо члену предложения и начинаются с вопросительного слова

who *кто*, **whom** *кого, кому*, **whose** *чей*; **what** *что, какой*; **which** *который* (из двух или нескольких); **where** *куда, где*; **when** *когда*; **why** *почему*; **how** *как*; **how many**, **how much** *сколько*. Специальные вопросы требуют полного ответа:

Where do you study?	Где вы учитесь?
I study at the MSTU named after Bauman.	Я учусь в МГТУ имени Баумана.

§ 7. Основные формы глаголов

В английском языке глаголы имеют четыре основные формы: 1) инфинитив, 2) прошедшее время, 3) причастие II, 4) причастие I. У правильных глаголов вторая и третья формы совпадают (оканчиваются на **-ed**). Каждый неправильный глагол имеет свои формы **Past Simple** и причастия II, у отдельных глаголов вторая и третья формы иногда тоже совпадают, но не оканчиваются на **-ed**. Четвертая форма у всех без исключения глаголов образуется с помощью окончания **-ing**, прибавляемого к основе глагола (инфинитив без частицы **to**).

Основные формы глагола

Infinitive	Past Simple	Participle II	Participle I
to use to send	used sent	used sent	using sending

§ 8. Страдательный залог (The Passive Voice)

Страдательный залог в английском языке употребляется тогда, когда внимание говорящего сосредоточено не на субъекте, а на объекте действия. Глагол в страдательном залоге показывает, что подлежащее подвергается действию, а не само его выполняет. Сравните:

He translates a book.	Он переводит книгу.
The book is translated .	Книгу переводят.

Страдательный залог образуется с помощью вспомогательного глагола **to be** в соответствующем времени, лице и числе и причастия II смыслового глагола, т. е. по формуле **to be + Participle II**.

The Passive Voice (Simple)

Present Simple	Past Simple	Future Simple
I am asked he, she, } is asked it we, you, } are asked they	I, he, } was asked she, it we, you, } were asked they	I, we shall be asked he, she, it, } will be asked you, they }
Меня спрашивают	Меня спрашивали	Меня спросят

Глагол в страдательном залоге можно переводить на русский язык тремя способами:

- 1) глаголом с окончанием *-ся, -сь*;
- 2) глаголом *быть* (в прошедшем и будущем времени) и краткой формой причастия;
- 3) неопределенно-личной формой глагола.

При переводе следует выбирать тот способ, который лучше всего подходит в каждом отдельном случае. Например:

Present	Many houses are built in this city.	Много домов строится (строят) в этом городе.
Past	Many houses were built last year.	Много домов было построено (построили, строилось).
Future	Many houses will be built soon.	Много домов будет построено (будет строиться) скоро.

§ 9. Особенности перевода пассивной конструкции

Следует помнить, что подлежащее в предложении с глаголом в страдательном залоге переводится на русский язык винительным или дательным падежом:

He **was sent** to the library.

Его послали в библиотеку.

He **was sent** a book.

Ему послали книгу.

§ 10. Предлог (The Preposition)

Предлоги — это служебные слова, которые указывают на связь существительных (или местоимений) с другими словами в предложении. Например:

We met **at** the door **of** my house. Мы встретились у двери **моего дома** (род. пад.).

По своей форме предлоги делятся на простые, сложные и составные. К простым предлогам относятся большей частью односложные предлоги, такие, как **in, on, at, by, to, with, from** и т.д. Сложные предлоги образуются путем сочетания двух слов: **inside** *внутри*, **outside** *снаружи*, **throughout** *через*, **upon** *на*, **into** *в*, **out of** *из* и т.д.

Составные предлоги — это предлоги, представляющие в основном сочетание существительного, прилагательного, причастия или наречия с простыми предлогами или союзами: **by means of** *с помощью, посредством*; **because of** *из-за*; **within** *внутри, в*; **instead of** *вместо*; **during** *в течение*; **in spite of** *несмотря на*; **in front of** *перед*; **in accordance with** *в соответствии с, согласно чему-либо*; **thanks to** *благодаря*; **owing to** *благодаря*; **according to** *в соответствии, по словам* и т.д. У большинства предлогов есть свои конкретные значения, например: **from** *от, из*; **under** *под*; **above** *над*; **after** *после*; **before** *перед, до*; **about** *о, около*; **on** *в, на*; **through** *через*; **towards** *к*; **round** *вокруг*; **without** *без* и т.д.

У некоторых предлогов (**of, by, for, with** и др.) значения конкретизируются только в контексте, например:

Here's a letter for you.	Вот письмо для тебя.
She's been here for two weeks.	Она находится здесь в течение двух недель.
How much do they pay for the work?	Сколько они платят за работу?
They went out for a walk.	Они пошли на прогулку.
There is a man waiting for you.	Тебя ждет какой-то человек.

Хотя предлоги обычно ставятся перед существительными, в английском языке есть несколько конструкций, в которых предлог отделяется от того существительного, к которому он относится. Это происходит в следующих случаях:

1) в специальных вопросах:

What are you looking at ?	На что ты смотришь?
What is this article about ?	О чем эта статья?

2) в придаточных предложениях:

I don't know what problems they are going to begin with .	Я не знаю, с каких проблем они собираются начать.

3) в пассивных конструкциях:

The laboratory assistant was sent **for**. **За** лаборантом послали.

LESSON 2

§ 11. Времена группы Continuous

Времена группы **Continuous** образуются с помощью вспомогательного глагола **to be** в соответствующем времени, лице и числе и причастия I, т. е. по формуле **to be + Participle I (-ing)**.

The Continuous (Active)

Present	Past	Future
<i>Утвердительная форма</i>		
I am writing He, she, } is writing it We, you, } are writing they	I, he, } was writing she, it } We, you, } were writing they }	I, } shall be writing we } He, she, } it, you, } will be writing they }
<i>Вопросительная форма</i>		
Am I writing? Is { he, } writing? { she, } { it } Are { we, } writing? { you } { they }	Was { I, he, } writing? { she, it } Were { we, you } writing? { they }	Shall { I, } be writing? { we } Will { he, } be writing? { she, } { it, } { you, } { they }
<i>Отрицательная форма</i>		
I am not writing He, she, } is not writing it We, you, } are not writing? they	I, he, } was not writing she, it } We, you, } were not writing they }	I, } shall not be writing we } He, } she, } will not be writing it, } you, } they }

Времена группы Continuous употребляются для выражения действия, происходящего в какой-то определенный момент времени в настоящем, прошедшем и будущем. Этот момент может подразумеваться из контекста или может быть обозначен либо конкретным указанием на время, например: *в 10 часов*, либо указанием на другое однократное действие, например: *когда мы вошли, когда мы вернулись* и т.д.

В **the Present Continuous** момент может быть выражен словами **now сейчас**, **at the present moment в настоящий момент**, **at this moment в этот момент**. Например:

They **are doing** grammar exercises now.

Они делают грамматические упражнения сейчас.

They **were doing** grammar exercises when he came in.

Они делали грамматические упражнения, когда он вошел.

They **will be doing** grammar exercises at 10 o'clock tomorrow.

Они будут делать грамматические упражнения завтра в десять часов.

Глаголы, выражающие чувства: **to love любить**, **to like нравиться**, **to hate ненавидеть** и т. п.; восприятия: **to see видеть**, **to hear слушать**, **to feel чувствовать**, **to know знать**, **to remember помнить**, **to understand понимать** и т. п.; а также глаголы **to belong принадлежать**, **to contain содержать**, **to consist состоять**, **to possess обладать**, как правило, в форме Continuous не употребляются. Например:

Thank you, I **feel** much better now.

Благодарю Вас, я чувствую себя гораздо лучше.

На русский язык времена группы Continuous переводятся глаголами несовершенного вида настоящего, прошедшего или будущего времени. Длительный характер действия передается словами *сейчас, в данный момент, в это время* и т. п.:

You can talk to him. He is not working.

Вы можете поговорить с ним. Он не работает **в данный момент**.

He was getting ready for his final exam, when I came in.

Он готовился к выпускным экзаменам, **когда я пришел**.

She will be working at her article at that time tomorrow.

Завтра **в это время** она будет работать над своей статьей.

The Continuous (The Passive)

to be + being + Participle II			
Present	I he, she, it we, you, they	am + is are	} being written
Past	I, he, she, it we, you, they	+ was were	

В страдательном залоге **the Future Continuous** не употребляется. Три способа перевода страдательного залога (см. § 8) справедливы и для перевода времен группы Continuous, но последние переводятся глаголом несовершенного вида:

The book is being read.

Книгу **читают**.

§ 12. Функции и перевод it

В предложении **it** может употребляться:

1) как личное местоимение в функциях подлежащего (именительный падеж) и дополнения (объектный падеж); переводится словами *он, она* или *его, ее*:

Take this book.

Возьми эту книгу.

It is interesting.

Она интересная.

Read it.

Прочти **ее**.

We shall speak about **it** next time.

Мы поговорим **о ней** в следующий раз.

2) как указательное местоимение (переводится словом *это*):

What is **it**? **It** is our new laboratory.

Что **это**? **Это** наша новая лаборатория.

3) как формальное (вводящее) подлежащее в выражениях типа

It is cold.

Холодно.

It is getting dark.

Темнеет.

It is winter.

Зима

It is necessary to...

Необходимо...

It seems...

Кажется...

It is known that...

Известно, что...

В этих предложениях **it** не переводится.

4) в составе усилительной конструкции **it is ...that** (**it** не переводится):

It is this book that I want to read.

Именно эту книгу я хочу прочитать.

5) как формальное дополнение в выражениях типа **make it possible** *делать возможным*; **make it difficult** *затруднять*; **find it useful** *считать (находить) полезным* (здесь **it** также не переводится).

§ 13. Функции и перевод **one**

Слово **one** может быть:

1. Числительным. В этом случае **one** стоит перед существительным, является его определением и переводится словом **один**:

I have only **one** dictionary.

У меня есть только **один** словарь.

2. Неопределенным местоимением. Тогда **one** употребляется в качестве подлежащего в неопределенно-личных предложениях и на русский язык не переводится:

One can read such a text without a dictionary.

Можно читать такой текст без словаря.

3. Заменителем существительного. В этом случае **one** употребляется вместо ранее упомянутого существительного, чтобы избежать его повторения. Перед словом-заменителем может стоять артикль и оно может употребляться в форме множественного числа (**ones**). Переводится **one** тем существительным, которое заменяет, или не переводится вообще, например:

You may take my dictionary (dictionaries).

Вы можете взять мой словарь (словари).

Thank you, I have **one (ones)**, **the one** that Peter gave me yesterday.

Спасибо, у меня есть **словарь (словари)**, **тот**, который дал мне вчера Петя.

§ 14. Функции и перевод **that**

That может быть:

1. Указательным местоимением. В этом случае оно стоит перед существительным и является определением. Во множественном числе употребляется слово **those**. На русский язык

that (those) переводится словами *тот, та, то (me); этот, эта, это (эту)*:

That house was built in 1970.

Тот дом был построен в 1970 году.

Can you repeat all **those** questions which the teacher asked?

Можете вы повторить все те вопросы, которые задал преподаватель?

2. Относительным местоимением. В этом случае **that** стоит после существительного, вводит определительное придаточное предложение и переводится словом *который*:

The book **that** you gave me yesterday is interesting.

Книга, **которую** вы мне вчера дали, интересная.

3. Союзом дополнительного придаточного предложения. В этом случае **that** стоит после глагола и переводится на русский язык словом *что*:

We know **that** he studies at the Moscow University.

Мы знаем, **что** он учится в МГУ.

4. Союзом подлежащего придаточного предложения. В этом случае **that** стоит в начале предложения и переводится словами *то, что*:

That the profession of an engineer requires a special training is a well-known fact.

То, что профессия инженера требует специальной подготовки — хорошо известно.

5. Союзом сказуемого придаточного предложения. В этом случае **that** стоит после глагола **to be** и переводится словами *то, что*:

The feature of higher education in this country is **that** it is available to all.

Особенностью высшего образования в нашей стране является **то, что** оно доступно всем.

6. Заменителем существительного, чтобы избежать повторения существительного в единственном числе; чтобы не повторять существительное во множественном числе употребляются **those** и **these**. В этом случае обычно за этими словами следует дополнение с предлогом. **That, those and these** переводятся на русский язык тем существительным, которое они заменяют, или вовсе не переводятся:

The climate of this part of the country differs from **that** of our region.

Климат этой части страны отличается от **климата** нашего района.

7. Частью усилительной конструкции **it is (was) ... that**, где **that** не переводится:

It was you **that** said so.
It was the invention of the steam engine **that** revolutionized production processes.

Это вы так сказали.
Именно изобретение парового двигателя коренным образом изменило все производственные процессы.

**§ 15. Степени сравнения прилагательных и наречий
(Comparison Degrees of Adjectives and Adverbs)**

Прилагательные в английском языке имеют три степени сравнения: положительную, сравнительную и превосходную.

Сравнительная и превосходная степени образуются двумя способами:

1. Путем прибавления суффикса **-er** в сравнительной степени и суффикса **-est** в превосходной степени к основе односложного прилагательного или наречия:

Положительная степень	Сравнительная степень	Превосходная степень
fast <i>быстрый, быстро</i>	faster <i>более быстрый, быстрее</i>	fastest <i>самый быстрый, быстрее всего</i>
hot <i>горячий, горячо</i>	hotter <i>более горячий, горячее</i>	hottest <i>самый горячий, горячее всего</i>
happy <i>счастливый</i>	happier <i>счастливее</i>	happiest <i>самый счастливый</i>
large <i>большой</i>	larger <i>больший</i>	largest <i>самый большой</i>

2. С помощью слов **more** в сравнительной степени и **most** в превосходной степени перед многосложными прилагательными и наречиями:

Положительная степень	Сравнительная степень	Превосходная степень
difficult <i>трудный</i>	more difficult <i>более трудный</i>	most difficult <i>самый трудный</i>

Некоторые прилагательные образуют степени сравнения не по общему правилу:

Положительная степень	Сравнительная степень	Превосходная степень
good, well <i>хороший, хорошо</i>	better <i>лучший, лучше</i>	best <i>самый лучший, лучше всего</i>
bad, badly <i>плохой, плохо</i>	worse <i>худший, хуже</i>	worst <i>самый худший, хуже всего</i>
little <i>маленький, мало</i>	less <i>меньший, меньше</i>	least <i>самый маленький, меньше всего</i>
much, many <i>много</i>	more <i>больше</i>	most <i>наибольший, больше всех</i>
far <i>далекий, далеко</i>	farther, further <i>более далекий, дальше</i>	farthest (о расстоянии), furthest (о времени и расстоянии) <i>самый далекий, дальнейший, дальше всего</i>
near <i>близкий, близко</i>	nearer <i>более близкий, ближе</i>	nearest (о расстоянии), next (о порядке следования) <i>ближайший, самый близкий, ближе всего</i>
late <i>поздний, последний, поздно</i>	later <i>более поздний, позже</i>	latest (о времени), last (о порядке следования) <i>самый последний, поздний, позднее всего</i>

LESSON 3

§ 16. Времена группы Perfect

Времена группы Perfect образуются с помощью вспомога-тельного глагола **to have** в соответствующем времени, лице и числе и причастия II смыслового глагола, т. е. по формуле: **to have + Participle II**.

The Perfect (Active)

Present	Past	Future
<i>Утвердительная форма</i>		
I, we, you, they } have written he, she, it } has written	I, he, she } had written it, we, you, they }	I, we } shall have written he, she, it, you, they } will have written

Present	Past	Future
<i>Вопросительная форма</i>		
Have { I, we, you, they } written?	Had { I, he, she, it, we, you, they } written?	Shall { I, we } have written?
Has { he, she, it } written?		Will { he, she, it, you, they } have written?
<i>Отрицательная форма</i>		
I, we, you, they } have not written	I, he, she, it, we, you, they } had not written	I, we } shall not have written
he, she, it } has not written		he, she, it, you, they } will not have written

Времена группы Perfect употребляются для выражения действия законченного, заверщенного к какому-то моменту времени в настоящем, прошедшем и будущем. **The Present Perfect** употребляется для выражения действия, законченного к настоящему моменту и связанного с настоящим своим результатом:

I have read the book.

Я прочитал эту книгу.

Действие закончилось к настоящему моменту, и результат действия налицо (книга прочитана). The Present Perfect употребляется с наречиями неопределенного времени: **today** сегодня, **this year** в этом году, **this week** на этой неделе, **already** уже, **always** всегда, **never** никогда, **so far** до сих пор, **ever** когда-либо, **just** только что, **often** часто, **not yet** еще нет. Например:

I have met him today.

Я встретил его сегодня.

The Past Perfect употребляется для выражения прошедшего действия, которое совершилось до определенного момента в прошлом. Этот момент может обозначаться:

1) обстоятельством времени с предлогом **by** к (by the beginning of, by the end of the month, by 10 o'clock, etc.):

By the beginning of the lecture
the lab assistant had brought all
the diagrams.

К началу лекции лаборант при-
нес все схемы.

2) другим (более поздним по времени) прошедшим дейст-
вием в Past Simple:

They **had translated** the article
when he came.

Они **уже перевели** статью, ко-
гда он пришел.

The Future Perfect употребляется для выражения действия,
которое будет закончено к какому-то моменту в будущем:

I **shall have done** all my work by
seven o'clock.

К семи часам я уже сделаю всю
свою работу.

На русский язык времена группы Perfect переводятся гла-
голом совершенного вида. The Present и Past Perfect перево-
дятся глаголом, как правило, прошедшего времени, а the Fu-
ture Perfect — глаголом будущего времени.

The Perfect (Passive)

to have + been + Participle II	
Present	I, we, you, they + have } been written he, she, it has }
Past	I, he, she, it } had been written we, you, they }
Future	{ I, we } + shall } he, she, it + will } have been written you, they }

Три способа перевода страдательного залога справедливы
и для перевода времен группы Perfect. Однако последние, как
правило, переводятся глаголом совершенного вида:

The work will have been
finished by the end of the week.

К концу недели работа будет
закончена.

§ 17. Соответствие английских временных форм временным формам глагола в русском языке

Русский язык	Английский язык	Примеры
Настоящее время	Present Simple	They play tennis on Sunday. <i>Они играют в теннис по воскресеньям.</i>
	Present Continuous	They are playing tennis now. <i>Они играют в теннис сейчас.</i>
	Present Perfect	They have lived in this town for ten years. <i>Они живут в этом городе 10 лет.</i>
Прошедшее время	Past Simple	They played tennis last Sunday. <i>Они играли в теннис в прошлое воскресенье.</i>
	Past Continuous	They were playing tennis at 10 o'clock last Sunday. <i>В прошлое воскресенье в десять часов они играли в теннис.</i>
	Present Perfect	They have already played tennis today. <i>Они сегодня уже играли в теннис.</i>
	Past Perfect	They had played tennis before we returned. <i>Они играли в теннис до того, как мы вернулись.</i>
Будущее время	Future Simple	They will play tennis tomorrow. <i>Они будут играть в теннис завтра.</i>
	Future Continuous	They will be playing tennis at this time tomorrow. <i>Завтра в это время они будут играть в теннис.</i>
	Future Perfect	They will have played tennis by the time we return home. <i>Они уже сыграют в теннис, когда мы вернемся домой.</i>

§ 18. Сводная таблица образования и упот
(изъявительное наклонение)

Active Voice <i>to ask</i>					
Simple <i>to ask</i>			Continuous <i>to be asking</i>		
Present <i>asks</i>	Past <i>asked</i>	Future <i>shall } ask will }</i>	Present <i>am } asking is } are }</i>	Past <i>was } asking were }</i>	Future <i>shall } be asking will }</i>
Passive Voice <i>to be asked</i>					
Simple <i>to be asked</i>			Continuous <i>to be being asked</i>		
Present <i>am } asked is } are }</i>	Past <i>was } asked were }</i>	Future <i>shall } be asked will }</i>	Present <i>am } being asked is } are }</i>	Past <i>was } being asked were }</i>	Future —
Употребление					
Действие как факт (обычное, постоянное, повторяющееся)			Действие как процесс (незаконченное, длящееся)		
usually, every day, often, seldom, sometimes	yesterday, last week, 5 days ago	tomorrow, next week	now	at 4 o'clock, from 6 o'clock till 7 o'clock ... when Bob came ...	

LESSON 4

§ 19. Согласование времен (Sequence of Tenses)

В английском языке существует правило согласования времен. Оно касается дополнительных придаточных предложений и заключается в том, что глагол-сказуемое придаточного предложения согласуется во времени с глаголом-сказуемым главного предложения. Это согласование выражается в следующем.

1. Если глагол-сказуемое главного предложения стоит в настоящем времени, то глагол-сказуемое придаточного предложения может стоять в любом требуемом по смыслу времени:

We know that he works hard.	Мы знаем, что он много работает .
We know that he worked hard yesterday.	Мы знаем, что он много работал вчера.
We know that he will work hard tomorrow.	Мы знаем, что он будет много работать завтра.

2. Если глагол-сказуемое главного предложения стоит в прошедшем времени, то глагол-сказуемое придаточного предложения также должен стоять в одном из прошедших времен, а именно:

а) если действие, выраженное глаголом-сказуемым придаточного предложения **совпадает** по времени с действием, выраженным глаголом-сказуемым главного предложения, то в придаточном предложении он употребляется в **the Past Simple** или в **the Past Continuous** и переводится на русский язык глаголом в настоящем времени:

We knew that he worked hard.	Мы знали, что он много работает .
We knew that he was working hard.	

б) если действие, выраженное глаголом-сказуемым придаточного предложения, **предшествует** действию, выраженному глаголом-сказуемым главного предложения, то в придаточном предложении глагол-сказуемое стоит в **the Past Perfect** и переводится на русский язык глаголом прошедшего времени:

We knew that he had worked hard.	Мы знали, что он много работал .

в) если действие, выраженное глаголом-сказуемым придаточного предложения, является **будущим** по отношению к действию, выраженному глаголом-сказуемым главного предложения, то в придаточном предложении употребляется глагол в **the Future in the Past** (будущее в прошедшем). Это время

употребляется только при согласовании времен и переводится на русский язык глаголом будущего времени. **The Future in the Past** образуется с помощью вспомогательных глаголов **should** для 1-го лица единственного и множественного числа и **would** для 2-го и 3-го лица единственного и множественного числа и инфинитива смыслового глагола без частицы **to**:

We knew that he **would work** hard tomorrow. Мы знали, что он будет много **ра- ботать** завтра.

Правила согласования времен соблюдаются при переводе предложений из прямой речи в косвенную:

She says, «I work today». Она говорит: «Я работаю сегодня». She says that she works today. Она говорит, что она работает се- годня.

She said, «I work today». Она сказала: «Я работаю сегодня». She said that she worked that day. Она сказала, что она работает се- годня.

Предложения, выражающие общий вопрос в прямой речи, в косвенную вводятся союзом **whether** или **if** *ли*:

He asked me, «Do you speak English?» Он спросил меня: «Вы говорите по-английски?»

He asked me **whether (if)** I spoke English. Он спросил меня, говорю **ли** я по-английски.

§ 20. Согласование времен

He says (that)	{	<u>he works (is working) работает</u>
		(одновременное действие)
		<u>he worked (was working) работал</u>
		(предшествующее действие)
		<u>he will work (will be working) будет работать</u>
		(будущее действие)

He said (that)	{	<u>he worked (was working) работает</u>
		(одновременное действие)
		<u>he had worked работал</u>
		(предшествующее действие)
		<u>he would work (would be working) будет работать</u>
		(будущее действие)

§ 21. Дополнение (The Object)

В английском языке различают **прямое** (отвечает на вопросы *кого? что?*), **косвенное** (*кому? чему?*) и **предложное** (*с кем? для кого? о чем?*) дополнения.

Прямое дополнение в английском языке соответствует в русском языке дополнению, выраженному существительным или местоимением **в винительном падеже** без предлога:

Ann met a friend .	Аня встретила друга .
We saw him yesterday.	Мы видели его вчера.
The engineer stopped the machine .	Инженер остановил механизм .

Косвенное дополнение в английском языке выражается именем существительным в общем падеже или местоимением в объектном падеже, которые соответствуют русским именам существительным или местоимениям **в дательном падеже**. Косвенное дополнение не употребляется без прямого дополнения и всегда стоит **перед** ним.

John sent the manager a report.	Джон послал менеджеру доклад.
Mother bought us new books.	Мама купила нам новые книги.

Предложное дополнение выражается сочетанием предлога с существительным или местоимением:

The teacher read a story to the children .	Учитель прочитал рассказ детям .
We spoke about him (to him) .	Мы говорим о нем (с ним) .

Местоимение **it** в функции дополнения употребляется в сочетании с прилагательными после глаголов **make, find, think, consider** и др. В этом случае местоимение **it** на русский язык не переводится.

make it possible	делать возможным, давать возможность
make it difficult (easy)	затруднять (облегчать)
No one thought (found, considered) it necessary to discuss the problem now.	Никто не считал нужным обсуждать проблему сейчас.

LESSON 5

§ 22. Определение (The Attribute)

Определение обычно относится к существительному. Оно может быть расположено перед определяемым существитель-

ным или после него. Определение отвечает на вопросы **what? what kind? какой, whose? чей, which? какой, который?** и др.

Определение может быть выражено:

1) прилагательным

a **difficult** work

трудная работа

Многосложные прилагательные типа **available, necessary, possible, reliable** и т. д. могут стоять и после определяемого существительного:

books **available** in this library

книги, **имеющиеся** в этой библиотеке

2) местоимением

his book

его книга

some students

некоторые студенты

at that time

в то время

3) числительным (количественным и порядковым)

several thousand students

несколько тысяч студентов

the **first** locomotive in Russia

первый паровоз в России

4) существительным в притяжательном падеже

the **professor's** lecture

лекция **профессора**

the **students'** notes

записи **студентов**

5) существительным в общем падеже

a **football** match

футбольный матч

Особенностью английского языка является частое употребление существительного перед другим существительным в качестве определения к нему. Функция такого существительного в предложении зависит только от его места перед существительным:

a **test** instrument

испытательный прибор

instrument **test**

испытание прибора

Существительное в общем падеже в функции определения переводится на русский язык прилагательным, существительным в родительном падеже или причастным оборотом.

б) существительным с предлогом

the building **of the institute**

здание **института**

the train **from Moscow**

поезд **из Москвы**

the text book **for beginners**

учебник **для начинающих**

the method **in use**

используемый метод

7) существительным-приложением, поясняющим стоящее перед ним существительное

The Cherepanovs, the inventors of the first Russian locomotive , were workers.	Черепановы, изобретатели первого русского паровоза, были рабочими.
We must translate this article by the end of the week, which is not an easy task .	Мы должны перевести эту статью к концу недели, что является нелегкой задачей.

8) причастием (Participle I или Participle II), которое может стоять как перед определяемым существительным, так и после него

a fast running taxi	быстромчащееся такси
students going to the University	студенты, которые идут (идущие) в Университет
illustrated journal	иллюстрированный журнал
the book translated in 1980	книга, переведенная в 1980 году

9) герундием

a way of reading	манера чтения
the possibility of using	возможность использования

10) инфинитивом

an article to translate	статья для перевода

11) определительным придаточным предложением, которое присоединяется к главному предложению при помощи союзных слов **who** *который*; **whom** *которого*; **whose** *чей, которого*; **when** *когда*; **where** *куда, где*; **why** *почему* или бессоюзным способом

I have read the article which you recommended .	} Я прочел статью, которую вы рекомендовали.
I have read the article you recommended .	
The town in which I live is not far from Moscow.	} Город, в котором я живу, (находится) недалеко от Москвы.
The town which I live in is not far from Moscow.	
The town I live in is not far from Moscow.	

§ 23. Неопределенные местоимения **some, any, no, every** и их производные

Местоимение **some** и его производные (**somebody, someone, something**) употребляются в утвердительных предложениях, **any** и его производные (**anybody, anyone, anything**) — в вопросительных и отрицательных предложениях, а **no** и его производные (**nobody, no one, nothing**) — в отрицательных предложениях (в последнем случае глагол-сказуемое стоит в утвердительной форме).

Сложные местоимения, в состав которых входит **body** или **one**, употребляются только в отношении лиц, а сложные местоимения, в состав которых входит **thing**, — в отношении неодушевленных предметов.

Any и его производные в утвердительном предложении имеют значение **любой**:

Which journal do you want?
Any will do.

Какой журнал вам нужен?
Любой подойдет.

Употребление местоимений **some, any, no, every**

Тип предложения	Местоимение	Перевод
Утвердительное	some somebody, someone something somewhere every everybody, everyone everything everywhere	некоторый, несколько, какой-то кто-то что-то где-то каждый, всякий всякий, каждый, все все езде, всюду
Вопросительное	any anybody, anyone anything anywhere	какой-нибудь кто-нибудь что-нибудь где-нибудь
Отрицательное	no nobody, no one nothing nowhere	никакой никто ничего нигде

LESSON 6

§ 24. Модальные глаголы (The Modal Verbs)

Модальные глаголы выражают не само действие или состояние, а отношение к ним со стороны говорящего. С помо-

шью модальных глаголов можно показать, что действие возможно или невозможно, обязательно или не нужно, вероятно или неправдоподобно, желательно и т.д. Модальными являются глаголы **can, may, must, ought, should, would, need**.

Особенностью модальных глаголов является то, что они:

1) не имеют полного самостоятельного значения и употребляются в сочетании с инфинитивом смыслового глагола (без частицы **to**);

2) не имеют инфинитива, причастия, герундия;

3) не имеют окончания **-s** в 3-м лице единственного числа настоящего времени;

4) не имеют формы прошедшего времени, кроме **can** и **may** (**could, might**), и будущего времени;

5) образуют вопросительную и отрицательную формы без вспомогательного глагола **to do**:

May I take your dictionary? He cannot drive a car.

Рассмотрим примеры употребления модальных глаголов.

Can

Глагол **can** имеет значение *мочь, обладать физической или умственной способностью*: **can** (настоящее время) *могу, может, можем* и т.д.; **could** (прошедшее время) *мог, могла, могло* и т.д. Например:

Even a child **can** lift it.

Даже ребенок может поднять это (это легко сделать).

Can you speak English?

Вы можете говорить по-английски?

Сочетание **to be able** *быть в состоянии* с последующим инфинитивом с частицей **to** является эквивалентом глагола **can** и восполняет его недостающие формы:

We shall **be able to do** it only tomorrow.

Мы сможем сделать это только завтра.

May

Глагол **may** имеет значения разрешения и возможности: **may** (настоящее время) *могу, может, можем* и т.д.; **might** (прошедшее время) *мог, могли* и т.д. Например:

May I come in?

Можно мне войти?

He **may** be at home.

Он, может быть, дома

Сочетания **to be allowed** и **to be permitted** с последующим инфинитивом с частицей **to** являются эквивалентом глагола **may** и восполняют его недостающие формы в значении *мочь, иметь разрешение*:

He **was allowed to** come in.

Ему разрешили войти.

Must

Глагол **must** выражает необходимость, моральную обязанность и соответствует в русском языке словам *должен, нужно, надо*. Глагол **must** имеет только одну форму настоящего времени:

You **must** do it yourself.

Вы должны это сделать.

Наряду с глаголом **must** и взамен его недостающих форм употребляются его эквиваленты **to have** (должен в силу обстоятельств) и **to be** (должен в силу запланированности, намеренности действия), а следующий за ними инфинитив имеет частицу **to**:

It was raining heavily and we **had to stay** at home.

Шел сильный дождь, и мы должны были остаться дома.

He **is to take** his exam in June.

Он должен сдавать этот экзамен в июне.

Ought

Глагол **ought** выражает моральный долг, желательность действия, относящиеся к настоящему и будущему времени. На русский язык **ought** переводится словами *следовало бы, следует, должен*. После **ought** инфинитив всегда употребляется с частицей **to**:

You **ought to** see a doctor.

Тебе следовало бы обратиться к врачу.

Should

Глагол **should** в качестве модального глагола выражает обязанность, желательность действия, совет, рекомендацию. На русский язык **should** переводится как *следует, должен, обязан*:

You **should** know about it.

Вам следует знать об этом.

Would

Глагол **would** в качестве модального глагола может выражать:

а) обычные и повторяющиеся действия в прошлом (в этом значении он является синонимом выражению **used to**):

He **would** spend hours in the Tretyakov Gallery. Он обычно проводил многие часы в Третьяковской галерее.

He **used to** spend hours in the Tretyakov Gallery. Он любил проводить многие часы в Третьяковской галерее.

б) упорное нежелание выполнить какое-то действие:

I asked him to do it but he **wouldn't**. Я попросил его сделать это, но он ни за что не хотел.

в) присущее свойство, характеристику (часто встречается в технической литературе):

Paper **would** burn. Бумага хорошо горит.

Need

Need может употребляться как модальный глагол и как правильный глагол. Как модальный глагол **need** имеет только одну форму. Он в основном употребляется в отрицательных предложениях:

You **needn't** come here to-day. Тебе не нужно приходить сюда сегодня.

§ 25. Функции глагола to be

Функция	Пример	Перевод
Смысловый глагол (be + предлог + существительное)	The book is on the table. This problem is of great importance.	Книга находится на столе. Эта проблема имеет огромное значение.
Глагол-связка (be + существительное или прилагательное)	He is a student. The speed of an electric car was not high. The speed of an electric car is about 60 km/h.	Он — студент. Скорость электро-мобиля была невысокая. Скорость электро-мобиля составляет 60 км/ч.

Функция	Пример	Перевод
Вспомогательный глагол: Continuous Tenses (be + Participle I) Passive Voice (be + Participle II)	He is writing a new article now.	Сейчас он пишет новую статью.
	The article is written by our professor.	Статья написана нашим профессором.
Модальный глагол (be + инфинитив с частицей to)	He is to come to the lab at 10 o'clock.	Он должен прийти в лабораторию в 10 часов.

§ 26. Функции глагола to have

Функция	Пример	Перевод
Смысловый глагол (have + существительное)	These laboratories have modern equipment.	Эти лаборатории имеют современное оборудование.
Вспомогательный глагол (have + Participle II)	These laboratories have bought modern equipment.	Эти лаборатории закупили современное оборудование.
Модальный глагол (have + инфинитив с частицей to)	These laboratories have to buy modern equipment.	Эти лаборатории должны закупить современное оборудование.

LESSON 7

§ 27. Причастие (The Participle)

Причастие является неличной формой глагола, которая обладает свойствами глагола, прилагательного и наречия. Подобно прилагательному, причастие может быть определением к существительному или именной частью составного сказуемого:

a **broken** cup
a cup was **broken**

разбитая чашка
чашка была **разбита**

Подобно наречию, причастие может быть обстоятельством, характеризующим действие, выраженное сказуемым:

Reading the text he wrote out **Читая** текст, он выписывал new words. новые слова.

Подобно глаголу, причастие имеет видовременные и залоговые формы, может иметь прямое дополнение и определяться наречием. В английском языке существует два вида причастий: **Participle I** и **Participle II**.

Participle I образуется путем прибавления окончания **-ing** к основе глагола:

to speak — speaking, to stop — stopping, to begin — beginning, to travel — travelling, to drive — driving, to lie — lying.

Participle II правильных глаголов образуется путем добавления окончания **-ed** к основе глагола:

to ask — asked, to train — trained.

Participle II неправильных глаголов образуется особыми способами; это третья форма неправильных глаголов:

to give — given, to build — built.

Все другие сложные формы **Participle I** образуются с помощью вспомогательных глаголов **to be** или **to have** и **Participle II** смыслового глагола.

Формы причастий

Participles	Active	Passive
Participle I	developing	being developed
Participle II	—	developed
Perfect Participle	having developed	having been developed

§ 28. Функции причастия в предложении.
Основные способы перевода

Причастие выполняет две функции в предложении — определения и обстоятельства.

1. Причастие в функции **определения** может занимать место перед определяемым существительным или после него. В этом случае **Participle I** обычно переводится на русский язык причастием действительного залога настоящего или прошедшего времени, оканчивающимся на **-ущий, -ющий, -ащий, -ящий, -вший**:

The **waiting** man is in the library.

Ожидающий человек — в библиотеке.

The man **waiting** for you has come from Moscow.

Человек, **ожидающий** вас, приехал из Москвы.

The man **waiting** for you asked for your telephone number.

Человек, **ждавший** вас, спрашивал ваш номер телефона.

Сложная форма Participle I пассивного залога в функции определения (после существительного) может переводиться также придаточным определительным предложением:

The house **being built** in this street now will be a new library.

Дом, **который строится (строящийся)** сейчас на этой улице, будет новой библиотекой.

Participle II в функции определения (перед или после существительного) переводится на русский язык страдательным причастием настоящего или прошедшего времени, оканчивающимся на *-емый, -имый, -нный*, или придаточным определительным предложением:

The **discussed** problems are interesting.

Обсуждаемые проблемы интересны.

The problems **discussed** at the conference are interesting.

Проблемы, **обсуждаемые (которые обсуждаются)** на конференции, интересны.

The problems **discussed** at the last conference were interesting.

Проблемы, **обсужденные (которые обсуждались)** на последней конференции, были интересны.

They spoke of the problems **discussed**.

Они говорили об **обсуждаемых** проблемах.

2. Причастие в функции **обстоятельства** обычно стоит в самом начале предложения, т. е. предшествует подлежащему, или следует за группой сказуемого. В этом случае причастие может выполнять функцию обстоятельства времени, причины, условия и т.д. В этой функции причастию могут предшествовать союзы **when, while, if, unless, once, though** и т.д. Причастие (с союзом или без него) переводится на русский язык или полным придаточным предложением времени, причины, условия, или деепричастием, оканчивающимся на *-я, -в*, или существительным с предлогом *при*:

While **reading** this book I met many new facts.

Читая (при чтении) эту книгу, я встретил много новых фактов.

Crossing the street first look to the left. When crossing the street, first look to the left. Being heated magnetised materials lose their magnetism. Having finished the test he put down the results. When (if) insulated, the wire may be used as a conductor. The motor gets overheated, unless cooled.	Переходя улицу, посмотрите сначала налево. Когда переходите (при переходе) улицу, посмотрите сначала налево. Если нагревать (при нагреве) намагниченные материалы, они размагничиваются. Закончив испытание, он записал результаты. Когда (если) провод изолирован (при изоляции), его можно использовать в качестве проводника. Мотор перегревается, если его не охлаждать.

**Сопоставление перевода причастий
в функции определения и обстоятельства**

Participle I	Participle II
<i>В функции определения</i>	
A lot of students from developing countries (из развивающихся стран) study in this country. An electric car developing the speed of 50 km/h (развивающий скорость 50 км/ч) is being designed. The device being developed (разрабатываемый, который разрабатывается) will be tested at the plant.	Some American countries get help from developed countries (из развитых стран). The mechanism developed in our laboratory (разработанный в нашей лаборатории) is mass-produced. The method developed (разработанный метод) provided good results.
<i>В функции обстоятельства</i>	
(While, when) developing (Разрабатывая, Когда Белл разрабатывал) transmitter for deaf people Bell invented the telephone. Being developed (Когда будет разработан), a new supercomputer will be very powerful.	(When, if) developed (Когда (если) будут разработаны, При удачной разработке) successfully, space platforms may be very useful for national economy.

§ 29. Независимый причастный оборот

Независимый причастный оборот — это сочетание существительного в общем падеже (или местоимения в именительном падеже) с Participle I или Participle II, в котором существительное (или местоимение) выполняет роль подлежащего по отношению к причастию и не является подлежащим всего предложения. Такой оборот логически связан с предложением и по существу является его обстоятельством. Подобно обстоятельству, независимый причастный оборот может предшествовать подлежащему, т. е. стоять в начале предложения или следовать за группой сказуемого в конце предложения. Этот оборот всегда отделяется запятой от остальной части предложения.

В начале предложения в функции обстоятельства на русский язык этот оборот переводится, как правило, придаточным предложением причины, времени, условия с союзами *так как, когда, если* и др.:

The weather being fine, we went for a walk.

Weather permitting, the airplane will fly.

Так как погода была хорошая, мы пошли погулять.

Когда погода позволит, самолет вылетит.

В конце предложения независимый причастный оборот переводится на русский язык чаще всего самостоятельными предложениями или присоединяется союзами *а, и, причем*:

The cars at that time were very small, the engine being placed under the seat.

Автомобили в то время были очень маленькими, (и) двигатель размещался под сиденьем.

Некоторые независимые причастные обороты, начинающиеся предлогом **with**, переводятся так же, как и независимые причастные обороты без предлога **with**:

With supersonic planes flying at a speed five to six times above the speed of sound, it will be possible to cover the distance between Tokyo and Moscow in less than two hours.

Когда сверхзвуковые самолеты будут летать со скоростью, в 5—6 раз превышающей скорость звука, можно будет пролетать расстояние между Токио и Москвой меньше, чем за два часа.

The article deals with microwaves, with particular attention being paid to radio location.

Статья посвящена микроволнам, (причем) особое внимание уделено радиолокации.

LESSON 8

§ 30. Герундий (The Gerund)

Герундий — это неличная форма глагола, обладающая свойствами как существительного, так и глагола.

Герундий выражает действие, представляя его как название процесса. Герундий образуется путем прибавления окончания **-ing** к основе глагола. В русском языке нет формы глагола, соответствующей английскому герундию. Подобно существительному, герундий может быть в предложении подлежащим, частью сказуемого, прямым дополнением; перед ним может стоять предлог в функции определения или обстоятельства и, наконец, герундий может иметь в качестве определения существительное в притяжательном или общем падеже или притяжательное местоимение.

Подобно глаголу герундий имеет видовременные и залоговые формы, прямое дополнение и может определяться обстоятельством, выраженным наречием. В предложении

The energy of body is its capacity for **doing** work. Энергия тела — это его способность **совершать** работу.

герундий **doing** выполняет функцию определения существительного **capacity** (именное свойство герундия) и в то же время имеет прямое дополнение **work** (глагольное свойство герундия).

Формы герундия

Tense	Active	Passive
Simple Perfect	driving having driven	being driven having been driven

Функции герундия

Герундий может выполнять в предложении следующие функции:

1) подлежащего

Reading English is necessary for every engineer.

His **having read** that article helped him with his term work.

Чтение (читать) по-английски необходимо каждому инженеру.

То, что он прочел эту статью, помогло ему с курсовой работой.

В функции подлежащего герундий переводится на русский язык существительным или неопределенной формой глагола, придаточным предложением, если перед герундием стоят определяющие его слова.

2) части составного сказуемого

His favourite occupation is reading .	Его любимое занятие — чтение (читать) .

В функции именной части составного сказуемого герундий переводится на русский язык существительным или неопределенной формой глагола.

3) прямого и предложного дополнения

He likes reading .	Он любит чтение (читать) .

В функции прямого и предложного дополнения герундий переводится на русский язык существительным или неопределенной формой глагола.

В функции предложного дополнения герундий обычно употребляется после глаголов с послелогом **to depend on** *зависеть от*, **to insist on** *настаивать на*, **to agree to** *соглашаться*, **to object to** *возражать против*, **to think of** *думать о*, **to succeed in** *удаваться*, **to prevent from** *мешать* и т. д.:

He thinks of reading his report at the next conference.	Он думает прочитать свой доклад на следующей конференции.

4) обстоятельства

On (after) reading the article he made a short summary of it.	После чтения (прочитав статью) , он кратко изложил ее содержание.

By reading much we learn much.	Много читая , мы многое узнаем.

Перед герундием в функции обстоятельства всегда стоит один из следующих предлогов: **after, before, on, at, in, for, by, without** и др. В этой функции герундий обычно переводится существительным с предлогом или деепричастием несовершенного или совершенного вида.

5) определения

I like his way of reading .	Мне нравится его манера читать (чтения) .
I'm glad to have the opportunity of reading this book.	Я рад возможности прочитать эту книгу.

... a means of doing work.

... средство для выполнения работы.

Герундию в функции определения обычно предшествует предлог **of** (иногда **for**). В этой функции герундий переводится на русский язык существительным в родительном падеже, существительным с предлогом или неопределенной формой глагола.

Герундий с последующим существительным указывает на назначение предмета, отвечает на вопросы *для чего?*, *для какой цели?* и переводится либо существительным в именительном или родительном падежах, либо прилагательным:

reading hall

writing paper

читальный зал

почтовая бумага, писчая бумага, бумага для письма.

Герундиальный оборот

Герундиальный оборот — это сочетание притяжательного местоимения или существительного в притяжательном или общем падеже с герундием. Такой оборот переводится обычно придаточным предложением:

We knew of his having read his report at the conference.

We know of the earth behaving as a large magnet.

We knew of Newton's having written «the Principia» in a very short time.

Мы знали, что он прочитал свой доклад на конференции.

Мы знаем, что земля ведет себя как большой магнит.

Мы знаем, что Ньютон написал «Начала» за очень короткое время.

Функции герундия и причастия

Синтаксическая функция	Герундий	Причастие
Подлежащее	Driving a car is a profession	—
Сказуемое	His hobby is driving	He is driving to Kiev now
Дополнение	He writes articles about driving	—
Определение	His plan of driving to Kiev is not good	The man driving a car is our chief engineer
Обстоятельство	Before driving a car one must learn to do it properly	Driving a car one must be very attentive

LESSON 9

§ 31. Условные придаточные предложения (Conditional Sentences)

Условные придаточные предложения присоединяются к главному предложению следующими союзами: **if если, unless если не, provided (that), providing (that) при условии, что; при условии, если**. Различают три типа условных придаточных предложений.

1. Условные предложения первого типа (реальные) выражают вероятные (осуществимые) предположения, относящиеся к настоящему, прошедшему и будущему времени. В этом случае сказуемые главного и придаточного предложений выражаются глаголами в изъявительном наклонении:

If I come earlier, I'll have time to read.	Если я приду пораньше, у меня будет время почитать.

(В английском языке в условном предложении первого типа употребляется настоящее время для выражения значения будущего действия.)

If I come late, I have no time to read.	Если я прихожу поздно, у меня нет времени почитать.
If I came late, I had no time to read.	Если я приходил поздно, у меня не было времени почитать.

2. Условные предложения второго типа (маловероятные) выражают маловероятные предположения, относящиеся к настоящему или будущему времени. В этом случае сказуемые и в главном, и в придаточном предложениях употребляются в сослагательном наклонении, т. е. в условном предложении используется либо **were** для глагола **to be** для всех лиц и чисел, либо форма, совпадающая с **Past Simple**, для всех других глаголов. В главном предложении употребляется сочетание **should + Infinitive** без частицы **to** для 1-го лица единственного и множественного числа и **would + Simple Infinitive** для остальных лиц. В современном английском языке сочетание **would + + Simple Infinitive** употребляется и с 1-м лицом единственного и множественного лица, как бы вытесняя глагол **should**. Различие между ними исчезает совсем, когда в разговорной речи **should, would** сокращаются до **d**:

If I were free (today, tomorrow), I should go to the cinema.	Если бы я был свободен, я бы пошел в кино (сегодня, завтра).

If they **had** a car, they **would go** to the country.

Если **бы** у них **был** автомобиль, они **бы поехали** за город.

3. Условные предложения третьего типа (нереальные) выражают неосуществимые предположения, относящиеся к прошедшему времени. В этом случае в условном придаточном предложении используются формы, совпадающие с **Past Perfect**, а в главном — сочетание **should/would + Perfect Infinitive** без частицы **to**:

If I **had been** here yesterday, I **should have helped** you.

Если **бы** я **был** здесь вчера, я **бы помог** вам.

Второй и третий типы условных предложений, как относящиеся к настоящему и будущему времени, так и относящиеся к прошедшему времени, переводятся на русский язык одинаково, так как в русском языке существует только одна форма сослагательного наклонения — форма прошедшего времени глагола в сочетании с частицей *бы*. Эта форма в русском языке употребляется как в главном, так и в придаточном предложениях.

Ниже для сравнения приведены условные предложения трех типов:

If we **are** free (today, tomorrow), we **shall go** to the cinema.

Если мы **будем** свободны, мы **пойдем** в кино (сегодня, завтра).

If we **were** free (today, tomorrow), we **should go** to the cinema.

Если **бы** мы **были** свободны, мы **бы пошли** в кино (сегодня, завтра).

If we **had been** free (yesterday), we **should have gone** to the cinema.

Если **бы** мы **были** свободны, мы **бы пошли** в кино (вчера).

В условных предложениях второго и третьего типов союзы **provided, if** могут отсутствовать. В этом случае в условном предложении глаголы **were, had, should** ставятся перед подлежащим:

Were I you, I should not do it.

Если **бы** я **был** на вашем месте, я бы не делал этого.

Had he been here, he would have helped you.

Если **бы** он **был** здесь, он бы помог вам.

Should the temperature drop, the metal would set.

Если **бы температура понизилась**, металл бы затвердел.

§ 32. Инфинитив (The Infinitive)

Инфинитив представляет собой основу глагола, которой обычно предшествует частица **to**, и относится к его неличным формам.

Формы инфинитива

Tense	Active	Passive
Simple Continuous Perfect	to help to be helping to have helped	to be helped — to have been helped

1. **The Simple Infinitive Active** и **Passive** употребляется для выражения действия, одновременного с действием, обозначенным глаголом-сказуемым в предложении, в настоящем, прошедшем и будущем времени:

I am glad **to help** him.

Я рад **помочь** ему.

I was glad **to help** him.

Я был рад **помочь** ему.

I'll be glad **to help** him.

Я буду рад **помочь** ему.

I am glad **to be helped**.

Я рад, что **мне помогают**.

2. **The Continuous Infinitive Active** употребляется для выражения действия в процессе его развертывания, происходящего одновременно с действием, обозначенным глаголом-сказуемым в предложении:

I am glad **to be helping** him.

Я рад, что **сейчас помогаю** ему.

It was pleasant **to be helping** him again.

Было приятно снова **помогать** ему.

3. **The Perfect Infinitive Active** и **Passive** употребляется для выражения действия, которое предшествует действию, обозначенному глаголом-сказуемым в предложении:

I am glad **to have helped** him.

Я рад, что **помог** ему.

I am glad **to have been helped**.

Я рад, что **мне помогли**.

Функции инфинитива

Инфинитив может выполнять в предложении следующие функции:

1) подлежащего

To translate such an article without a dictionary is difficult.

To work with computer was new to many of us.

Переводить (перевод) такую статью без словаря трудно.

Работать (работа) с компьютером было новым для нас.

В этом случае инфинитив стоит в самом начале предложения во главе группы слов перед сказуемым. Инфинитив в функции подлежащего можно переводить как неопределенной формой глагола, так и отглагольным существительным.

2) обстоятельства цели

To translate such an article without a dictionary, you must know English well.

One must work hard **to master** a foreign language.

To increase the speed, the designers have to improve the aircraft shape and engine efficiency.

Once a week a student of Cambridge is to go to his tutor **to discuss** his work.

Чтобы переводить такую статью без словаря, вы должны хорошо знать английский язык.

Нужно много работать, **чтобы овладеть** иностранным языком.

Чтобы увеличить скорость, конструкторы должны улучшить форму самолета и КПД (эффективность) двигателя.

Раз в неделю студент Кембриджа должен встретиться со своим наставником, **чтобы обсудить** свою работу.

В этом случае инфинитив может стоять как в самом начале предложения перед подлежащим, так и в конце предложения. В функции обстоятельства цели инфинитиву могут предшествовать союзы **in order to, so as чтобы, для того чтобы**.

3) части сказуемого (простого и составного)

Our aim is **to translate** technical articles without a dictionary.

He can **translate** this article without a dictionary.

He will **translate** the article next week.

Наша цель — **переводить (перевод)** технические статьи без словаря.

Он может **переводить** такую статью без словаря.

Он будет **переводить** (переведет) эту статью на следующей неделе.

В этом случае инфинитив стоит либо после глагола **to be**, либо после модальных глаголов, либо после вспомогательных глаголов.

4) дополнения

He doesn't like **to translate** technical articles.

Он не любит **переводить** технические статьи.

The article was not difficult **to translate**.

Эту статью было нетрудно **переводить**.

I am glad **to have spoken** to our lecturer about my work.

Я рад(а), что **поговорил(а)** с нашим лектором о моей работе.

В этом случае инфинитив стоит после глагола или прилагательного.

5) определения

He was **the first to translate** this article.

Он **первым** перевел эту статью.

В этой функции инфинитив стоит после слов **the first, the second, the last** и т. д. или после существительного.

После существительного инфинитив чаще всего стоит в пассивной форме, обычно имеет модальное значение и выражает действие, которое должно произойти в будущем. В этом случае инфинитив переводится определительным придаточным предложением:

He gave me some articles **to translate**.

Он дал мне несколько статей, **которые нужно было перевести (для перевода)**.

Here is the article **to be translated**.

Вот статья, **которую нужно перевести**.

Here is the article **to translate**.

Вот статья **для перевода**.

Gagarin was **the first to orbit** the Earth.

Гагарин **первый** облетел Землю.

The device **to be tested** has been made in our lab.

Прибор, **который будет (должен) испытываться**, сделан в нашей лаборатории.

§ 33. Инфинитивный оборот с предлогом **for**

Инфинитивный оборот с предлогом **for** представляет собой сочетание предлога **for** с существительным в общем падеже или местоимением в объектном падеже и инфинитива. Инфинитив показывает, какое действие должно быть совершено лицом, обозначенным существительным или местоимением. Этот оборот переводится на русский язык придаточным предложением обычно с союзом *что, чтобы*:

He waited **for her to speak**.

Он ждал, **что она** заговорит.

We stopped for them to pass by.	Мы остановились, чтобы они могли пройти.
It is difficult for students to learn FORTRAN.	Студентам трудно выучить FORTRAN.

LESSON 11

§ 34. Инфинитив как часть сложного дополнения (The Complex Object)

В английском языке суждение, мнение, предположение о чем-то или о ком-то можно выразить двумя способами:

1) сложноподчиненным предложением с дополнительным придаточным предложением

We know that Professor V. is a good specialist in this field.	Мы знаем, что профессор В. хороший специалист в этой области.

2) простым предложением со сложным дополнением, которое представляет собой сочетание существительного (в общем падеже) или местоимения (в объектном падеже) с инфинитивом. На русский язык сложное дополнение с инфинитивом переводится точно так же, как и сложноподчиненное предложение с дополнительным придаточным предложением

We know Professor V. (him) to be a good specialist in this field.	Мы знаем, что профессор В. (он) хороший специалист в этой области.

Сложное дополнение с инфинитивом употребляется после следующих глаголов: **to know** *знать*, **to want** *хотеть*, **to find** *находить, устанавливать*, **to like** *любить, нравиться*, **to think** *думать*, **to believe** *полагать*, **to assume** *допускать, предполагать*, **to consider** *считать*, **to expect** *предполагать*, **to allow** *позволять*, **to enable** *давать возможность*, **to cause** *заставлять* и др.:

They expect the meeting to be over soon.	Они предполагают, что собрание скоро закончится.

Особенностью употребления сложного дополнения с инфинитивом является то, что после некоторых глаголов опускается частица **to** перед инфинитивом. К ним относятся гла-

голы чувственного восприятия: **to feel** *чувствовать*, **to hear** *слышать*, **to see** *видеть*, **to watch** *наблюдать*, **to notice** *замечать*, **to let** *позволять*, **to make** *заставлять*:

The students heard **the professor speak** about his experimental work.

Студенты слышали, **как профессор говорил** о своей экспериментальной работе.

He made **us do** this work.

Он заставил **нас сделать** эту работу.

§ 35. Инфинитив как часть сложного подлежащего (The Complex Subject)

В английском языке мнение или предположение группы неопределенных лиц о чем-то или о ком-то можно выразить двумя способами:

1) сложноподчиненным предложением

It is known that he is a good specialist.

Известно, что он хороший специалист.

It is expected that the experiment will be over soon.

Предполагают, что эксперимент скоро закончится.

2) простым предложением со сложным подлежащим, которое включает имя существительное (в общем падеже) или местоимение (в именительном падеже) и инфинитив. Инфинитивный оборот «сложное подлежащее» употребляется после следующих глаголов в страдательном залоге: **to know** *знать*, **to say** *говорить*, **to report** *сообщать*, **to find** *находить*, **to establish** *устанавливать*, **to assume**, **to suppose** *предполагать*, **to consider**, **to think** *считать*, *думать*, **to expect** *ожидать*, *полагать* и др.:

He is known to be a good specialist.

The experiment is expected to be over soon.

Перевод таких предложений следует начинать со сказуемого предложения и переводить его неопределенно-личным предложением *известно*, *предполагают*, *установлено*, *считают* и т. д., за которым следует придаточное предложение, вводимое союзом *что*:

Известно, что он хороший специалист.

Предполагают, что эксперимент скоро закончится.

Возможен и другой способ перевода этих предложений (начиная с подлежащего):

Он, **как известно**, хороший специалист.

Эксперимент, **как полагают**, скоро закончится.

Глагол-сказуемое может быть и в действительном залоге, если употребляются следующие глаголы: **to seem, to appear ка-заться, по-видимому, очевидно; to prove, to turn out оказываться; to happen случаться, оказываться:**

They **seem to work** very hard.

Они, **кажется**, много **работают**.

The method **appears to be** of some interest.

Этот метод, **по-видимому**, представляет интерес.

Наконец, глагол-сказуемое может быть составным: **to be likely вероятно, to be unlikely невероятно, маловероятно, едва ли, to be sure, certain несомненно, непременно, обязательно:**

Our professor **is likely to take part** in this discussion.

Наш профессор, **вероятно, примет участие** в этом обсуждении.

LESSON 12

§ 36. Сослагательное наклонение (The Subjunctive Mood)

Сослагательное наклонение показывает, что говорящий рассматривает действие не как реальный факт, а как предполагаемое, желательное или нереальное.

В русском языке имеется только одна форма сослагательного наклонения — сочетание формы глагола прошедшего времени с частицей *бы* (*сделал бы, хотел бы* и т.д.) Эта форма может относиться к настоящему, прошедшему или будущему времени.

В английском языке имеется несколько форм сослагательного наклонения.

При выражении предположения, желания или возможности в настоящем или будущем времени простые формы сослагательного наклонения совпадают с формой инфинитива без частицы **to** для всех лиц и чисел или с формой **Past Simple**. Глагол **to be** в этом случае имеет формы **be** и **were** для всех лиц и чисел. Сложная форма сослагательного наклонения представляет собой сочетание **should (would)** с **Simple Infinitive** без частицы **to**:

It is high time **he were** here.

Давно пора ему **быть** здесь.

They could take this exam.	Они могли бы сдать этот экзамен.
I should come with pleasure.	Я бы пришел с удовольствием.

При передаче действия нереального, относящегося к прошлому, простая форма сослагательного наклонения совпадает с формой **Past Perfect**, а сложная форма представляет собой сочетание глаголов **should** и **would** с **Perfect Infinitive** без частицы **to**:

They had taken the text-books, but the library was closed then.	Они взяли бы учебники, но библиотека была тогда закрыта.
We should have come .	Мы бы пришли.

§ 37. Употребление различных форм сослагательного наклонения

Формы сослагательного наклонения употребляются:

1) в простых предложениях

I should like to get this book.	Мне бы хотелось достать эту книгу.
He would like to join us.	Он хотел бы присоединиться к нам.
He could do it tomorrow.	Он смог бы сделать это завтра.
They would have helped you, but they couldn't come.	Они бы помогли вам , но не смогли прийти.
You could have done it. Why didn't you try?	Вы могли бы это сделать, почему же вы не попытались?

2) в сложноподчиненных предложениях:

а) в придаточных предложениях после безличных оборотов типа

It is	{	necessary	} that ...	Необходимо, чтобы...
		important		Важно, чтобы...
		essential		Существенно, чтобы...
		desirable		Желательно, чтобы...
		possible		Возможно, что...
		improbable		Маловероятно, что...
		suggested		Предполагается, что...
		proposed		Предполагается, чтобы...
		required		Требуется, чтобы...
		demande		Требуется, чтобы...
ordered	Необходимо, чтобы...			

В этом случае сложная форма сослагательного наклонения образуется с помощью **should** для всех лиц:

It is desirable that he should be present here.

Желательно, чтобы он присутствовал здесь.

б) в дополнительных придаточных предложениях после глаголов **to suggest предполагать, to propose предлагать, to desire желать, to require, to demand требовать, to order приказывать, to insist настаивать** и т. д.:

The engineer demanded that the test **be (should be) repeated.**

Инженер потребовал, чтобы испытание **повторили.**

в) в дополнительных придаточных предложениях после глагола **wish**:

I wish he **were** with us.

Мне жаль, что **его** с нами нет.

I wish you **had brought** your camera.

Мне жаль, что ты **не принес** свою камеру.

I wish he **would tell** us everything.

Я **бы хотел, чтобы** он нам все рассказал.

I wish he **could come** to the party.

Мне **бы хотелось, чтобы** он **пришел** на вечер.

I wish you **had done** it more carefully.

Мне **бы хотелось, чтобы** вы более тщательно **сделали** это.

г) в придаточных предложениях цели после союзов **so that, in order that так, чтобы; lest чтобы не.** В этом случае **should** употребляется для всех лиц:

Send him out of the room so that he **should not hear** what we talk about.

Отошли его из комнаты, **чтобы** он **не слышал**, о чем мы разговариваем.

She put the letter away lest her husband **should see** it.

Она убрала письмо, **чтобы** его **не увидел** муж.

д) в придаточных сравнения с союзами **as if** или **as though** *как будто, словно*:

The house is so quite **as if** there were nobody in it.

В доме было так тихо, **как будто** в нем никого нет.

е) в обеих частях сложноподчиненного предложения с условными придаточными второго и третьего типов:

If I **were** not so tired, I **should go** with you.

Если **бы** я так не устал, я **бы пошел** с вами.

If they **had** a car, they **would go** to the country.

Если **бы** у них **был** автомобиль, они **бы поехали** за город.

If he **hadn't phoned** her, she **wouldn't have come.** Если бы он не позвонил ей, она бы не пришла.

§ 38. Особенности страдательного залога

В английском языке в страдательном залоге могут употребляться непереходные глаголы с предлогами и послелогами. К таким глаголам относятся: **to send for** *посылать за*, **to follow by** *следовать за*, **to look at** *смотреть на*, **to speak of, about** *говорить о*, **to rely on** *положиться на*, **to refer to** *ссылаться на*, **to act upon** *действовать на*, **to influence by** *влиять на*, **to deal with** *иметь дело с, рассматривать*, **to work at, on** *работать над* и др. В этих случаях перевод предложения следует начинать с предлога:

The doctor was **sent for**.

За доктором послали.

His project was much **spoken about**.

О его проекте много говорили.

This reference-book can be **relied on**.

На этот справочник можно положиться.

АНГЛО-РУССКИЙ СЛОВАРЬ

a adjective — имя прилагательное

adv adverb — наречие

cj conjunction — союз

n noun — имя существительное

pl plural — множественное число

pp — причастие II

pron — местоимение

prp preposition — предлог

v verb — глагол

А

abandon [ə'bændən] *v* покидать, оставлять

abbey ['æbi] *n* аббатство, монастырь

ability [ə'bɪlɪti] *n* способность

able ['eɪbl] *a* способный; **to be** ~ быть в состоянии

about [ə'baut] *adv* около, приблизительно, относительно; *prp* вокруг, о

above [ə'blʌv] *prp* над; выше; *adv* ~ **mentioned** вышеупомянутый

abruptly [ə'brʌptli] *adv* внезапно, резко

absence ['æbsəns] *n* отсутствие

absent ['æbsənt] *a* отсутствующий;

absolute ['æbsəlu:t] *a* полный, совершенный, абсолютный

absorb [əb'sɔ:b] *v* поглощать, впитывать

academic [ækə'demɪk] *a* академический; ~ **year** учебный год

accelerate [æk'seləreɪt] *v* ускорять

acceleration [æk'selə'reɪʃən] *n* ускорение

accelerator [æk'seləreɪtə] *n* ускоритель, акселератор

accept [æk'sept] *v* принимать (*предложение*)

access ['ækses] *n* доступ, подход; ~ **time** время выборки, время обращения

accessible [æk'sesəbl] *a* доступный, достижимый

accident ['æksɪdənt] *n* несчастный случай

accomodate [ə'kɒmədeɪt] *v* приспособлять, предоставлять жилье

accomodation [ə,kɒmə'deɪʃən] *n* помещение, жилье

accompany [ə'kʌmpəni] *v* сопровождать

accomplish [ə'kɒmplɪʃ] *v* заканчивать, завершать

accomplishment [ə'kɒmplɪʃmənt] *n* достижение, выполнение, завершение

accordance [ə'kɔ:dəns] *n* **in** ~ **with** согласно чему-либо, в соответствии с чем-либо

according (to) [ə'kɔ:dɪŋ] *v* в соответствии с чем-либо

accordingly [ə'kɔ:dɪŋli] *adv* соответственно, в соответствии; таким образом, следовательно

account [ə'kaunt] *n* **on** ~ **of** из-за, вследствие; *v* ~ **for** отчитываться за что-либо; объяснять что-либо

accounting [ə'kauntɪŋ] *n* учет, отчетность

accumulate [ə'kju:mjuleɪt] *v* аккумулять, накапливать
accuracy ['ækjʊrəsi] *n* точность
accurate ['ækjʊrɪt] *a* точный
achieve [ə'tʃi:v] *v* достигать
achievement [ə'tʃi:vmənt] *n* достижение
acknowledge [ək'nɒlɪdʒ] *v* признавать
acquire [ə'kwaɪə] *v* приобретать (значение, авторитет)
across [ə'krɒs] *prp* через; *adv* поперек
act [ækt] *v* действовать; ~ (on, upon) воздействовать, влиять
action ['ækʃən] *n* действие
active ['æktɪv] *a* активный
activity [æk'tɪvɪti] *n* деятельность
actual ['æktʃuəl] *a* действительный, фактический
actually ['æktʃuəli] *adv* в действительности, действительно
add [æd] *v* добавлять, прибавлять, складывать
addition [ə'dɪʃən] *n* сложение, добавление; **in** ~ **to** после, потом, в дополнение к
adapt [ə'dæpt] *v* приспособлять, прилаживать, подгонять; адаптировать
address [ə'dres] *v* обращаться к кому-либо; *n* адрес
adequate ['ædɪkwɪt] *a* соответствующий, адекватный
adjust [ə'dʒʌst] *v* регулировать
admiral ['ædmərəl] *n* адмирал
adopt [ə'dɒpt] *v* принимать (систему, концепцию)
advance [əd'vɑ:ns] *v* выдвигать (идею, теорию), продвигать вперед; **in** ~ вперед, заранее

advanced [əd'vɑ:nst] *a* передовой, прогрессивный
advantage [əd'vɑ:ntɪdʒ] *n* преимущество; **to take** ~ воспользоваться преимуществом
advantageous [əd'væn'teɪdʒəs] *a* выгодный, благоприятный
advice [əd'vaɪs] *n* совет
advisable [əd'vaɪzəbl] *a* рекомендуемый
advise [əd'vaɪz] *v* советовать, рекомендовать
adviser [əd'vaɪzə] *n* консультант, научный руководитель
aerial ['ɛəriəl] *n* антенна
aeronautics [ɛərə'nɒ:tɪks] *n* авиация
affect [ə'fekt] *v* влиять на что-либо, воздействовать
afloat [ə'fləʊt] *adv* на плаву, на воде
after ['ɑ:ftə] *prp, cj, adv* после; после того как; потом; ~ **all** в конце концов
afterwards ['ɑ:ftəwədʒ] *adv* кроме того, к тому же
again [ə'gen] *adv* снова, опять
against [ə'genst] *prp* против, на, к (чему-либо)
age [eɪdʒ] *n* возраст, **at the** ~ **of** в возрасте; век, период, эпоха
ago [ə'gəʊ] *adv* тому назад
agree [ə'gri:] *v* соглашаться
agreement [ə'gri:mənt] *n* соглашение
ahead [ə'hed] *adv* вперед, впереди; **a few years** ~ через несколько лет
aid [eɪd] *v* помогать; *n* помощь
aim [eɪm] *v* направлять, нацеливать(ся); *n* цель; **to be** ~**ed at** предназначаться для чего-либо

air [ɛə] *n* воздух, атмосфера; ~ **drag** аэродинамическое сопротивление

aircraft ['ɛəkrɑ:ft] = **airplane** *n* самолет, аэроплан; ~ **construction** [kən'strʌkʃən] самолетостроение

airfield ['ɛəfi:ld] *n* аэродром

alive [ə'laɪv] *a* живой, в живых

all [ɔ:l] *pron* весь, все, вся, все; ~ **kind of** = ~ **sorts of** самые разнообразные, всякие; ~ **of them** все; ~ **over again** снова и снова; ~ **over the world** во всем мире; ~ **right** хорошо, ладно; **in** ~ полностью, всего; **at** ~ вообще, совсем

allow [ə'laʊ] *v* позволять, разрешать

allowance [ə'laʊəns] *n* содержание (годовое, месячное), карманные деньги; разрешение, позволение

alloy ['ælɔɪ] *n* сплав

almost ['ɔ:lməʊst] *adv* почти

alone [ə'ləʊn] *a* один, одинокий; *adv* только

along [ə'lɒŋ] *prp* по, вдоль; ~ **with** наряду с; параллельно с

alphabet ['ælfəbɪt] *n* алфавит

alphanumeric [ælfə'njʊmerɪkəl] *a* буквенно-цифровой (*алфавит*)

already [ɔ:l'redɪ] *adv* уже

also ['ɔ:lsəʊ] *adv* тоже, также

alternative [ɔ:l'tə:nətɪv] *a* другой (*при выборе*), переменный, разный; *n* выбор

although [ɔ:l'dəʊ] *conj* хотя; несмотря на то, что

altogether [ɔ:ltə'geðə] *adv* совершенно, совсем

aluminium [æljʊ'mɪnjəm] *n* алюминий

a.m. (ante meridiem) время от 12 ночи до 12 дня (до полудня)

among [ə'mʌŋ] *prp* среди, между

amount [ə'maʊnt] *v* достигать; *n* количество, степень, величина

amplification [æmplɪfɪ'keɪʃən] *n* увеличение, расширение, усиление

amplifier ['æmplɪfaɪə] *n* усилитель

amplify ['æmplɪfaɪ] *v* расширять(ся), усиливать

analyse ['ænəlaɪz] *v* разбирать, анализировать; рассматривать

analysis [ə'næləsis] *n* анализ

ancestor ['ænsɪstə] *n* предок

ancient ['eɪfənt] *a* древний, старинный, старый

angle ['æŋɡl] *n* угол

announce [ə'naʊns] *v* объявлять, заявлять

announcement [ə'naʊnsmənt] *n* объявление

annually ['ænjuəlɪ] *adv* ежегодно

another [ə'nʌðə] *a* другой; еще один

antenna [æn'tenə] (*pl antennae*) *n* антенна

anticipate [æn'tɪsɪpeɪt] *v* предвидеть, предвосхитить

anyway ['eniweɪ] *adv* во всяком случае

apart [ə'pɑ:t] *adv* на расстоянии, отдельно; ~ **from** не говоря уже о, кроме, не считая

apparatus [æpə'reɪtəs] *n* аппарат, прибор, устройство

apparently [ə'pærəntli] *adv* явно, очевидно, по-видимому, видимо, вероятно

appear [ə'pɪə] *v* появляться, казаться; ~ **useful** оказаться полезным

appearance [ə'pɪərəns] *n* появление, наружность, внешний вид

appliance [ə'plaɪəns] *n* устройство, приспособление

applicable ['æplɪkəbl] *a* применимый, пригодный, подходящий

application [ˌæplɪ'keɪʃən] *n* применение; заявление

apply [ə'plaɪ] *v* применять, использовать; ~ **to** обратиться к (с просьбой)

approach [ə'prəʊtʃ] *v* подходить, приближать(ся); *n* приближение, подход (к решению задачи)

approve [ə'pru:v] *v* одобрять

approximate [ə'prɒksɪmɪt] *a* приблизительный; ~ **calculation** приближенные вычисления

arc [ɑ:k] *n* дуга

architect ['ɑ:kɪtekt] *n* архитектор

architecture ['ɑ:kɪtektʃə] *n* архитектура

area ['ɛəriə] *n* площадь, участок, место, пространство

arise (arose, arisen) [ə'raɪz, ə'rəʊz, ə'rɪzn] *v* возникать

arm [ɑ:m] *n* рука; рычаг

armoured ['ɑ:məd] *a* бронированный

army ['ɑ:mi] *n* армия

around [ə'raʊnd] *adv* кругом; *prp* вокруг

arrange [ə'reɪndʒ] *v* устанавливать, устраивать, располагать

arrangement [ə'reɪndʒmənt] *n* устройство, расположение

arrival [ə'raɪvəl] *n* приход, прибытие

arrive [ə'raɪv] (**at, in**) *v* прибывать, приезжать

art [ɑ:t] *n* искусство, умение

article ['ɑ:tɪkl] *n* статья; изделие

artificial [ˌɑ:trɪ'fiʃəl] *a* искусственный

artillery [ɑ:'tɪləri] *n* артиллерия; *a* артиллерийский

artist ['ɑ:tɪst] *n* художник

as [æz] *conj* так как; ~ *adv* как, по мере того как, в то время как, когда, в качестве (чего-либо, кого-либо);

~ **a consequence** ['kɒnsɪkwəns] в результате, как результат; ~ **far** ~ так далеко, до; ~ **early** ['ɜ:li] еще давно (о времени); ~ **far back** ['fɑ:bæk] еще; ~ **follows** ['fɒləʊz] следующим образом; ~ **if** как если бы; ~ **long** ~ пока (по времени); ~

much ~ **possible** как можно больше; ~ **a result** [rɪ'zʌlt] в результате; ~ **a rule** [ru:l] как правило; ~ **soon** ~ как только; ~ **soon** ~ **possible** как можно скорее; ~ **though** [ðəʊ] как если бы; ~ **to** что касается; ~ **well** а также; ~ **well** ~ так же как

ascend [ə'send] *v* подниматься, двигаться вверх

ascent [ə'sent] *n* подъем; движение вверх

ask [ɑ:sk] *v* спрашивать, просить; ~ **for** (smth.) просить что-либо

aspect ['æspekt] *n* вид, особенность, аспект

assemble [ə'sembl] *v* собирать

assembling [ə'semblɪŋ] *n* сборка

assembly [ə'semblɪ] *n* сборка; *a* сборочный; ~ **shop** сборочный цех; ~ **line** конвейер

assist [ə'sɪst] *v* помогать

assistance [ə'sɪstəns] *n* помощь

assistant [ə'sɪstənt] *n* преподаватель, ассистент, помощник

associated [ə'səʊʃɪeɪtɪd] *a* **to be** ~ **with** быть связанным с чем-либо

assume [ə'sju:m] *v* допускать, полагать, принимать

assumption [ə'sʌmpʃən] *n* допущение, предположение

astronomer [əs'trɒnəmə] *n* астроном

astronomy [əs'trɒnəmi] *n* астрономия

at [æt] *prp* у, около, во, на; ~ **last** [lɑ:st] наконец; ~ **least** [li:st] по крайней (меньшей) мере; ~ **once** [wʌns] сейчас же, сразу; ~ **present** ['preznt] в настоящее время; ~ **one time or another** ['wʌn taɪm ɔ:rə'nʌðə] в то или иное время

atmosphere ['ætməsfiə] *n* атмосфера

atmospheric [ætməs'ferɪk] *a* атмосферный

atom ['ætəm] *n* атом

atomic ['ætɒmɪk] *a* атомный

attach [ə'tæʃ] *v* прикреплять, присоединять

attachment [ə'tæʃmənt] *n* прикрепление, приспособление; принадлежность

attain [ə'teɪn] *v* достигать, получать

attempt [ə'tempt] *n* попытка

attend [ə'tend] *v* посещать

attention [ə'tenʃən] *n* внимание

attentive [ə'tentɪv] *a* внимательный

attentively [ə'tentɪvli] *adv* внимательно

attitude ['ætɪtju:d] *n* отношение (к чему-либо)

attract [ə'trækt] *v* притягивать; ~ **attention** привлекать внимание

attractive [ə'træktɪv] *a* привлекательный, притягательный, заманчивый

audible ['ɔ:dəbl] *a* слышимый, достаточно громкий

audience ['ɔ:dʒəns] *n* публика, аудитория (о людях)

author ['ɔ:θə] *n* автор

automatic [ɔ:tə'mætɪk] *a* автоматический

automatically [ɔ:tə'mætɪkəli] *adv* автоматически; ~ **controlled** [kən'trəuld] с автоматическим управлением

automation [ɔ:tə'meɪʃən] *n* автоматизация

automatize ['ɔ:təmetaɪz] *v* автоматизировать

automobile ['ɔ:təməubi:l] *n* автомобиль; *a* автомобильный; ~ **body** кузов автомобиля

automotive [ɔ:tə'məutɪv] *a* само движущийся, автомобильный

availability [ə'veɪlə'bɪlɪti] *n* наличие

available [ə'veɪləbl] *a* существующий, наличный, доступный

average ['ævərɪdʒ] *a* средний, приблизительный; *v* выводить среднее число, в среднем равняться, составлять

aviation [eɪvɪ'eɪʃən] *n* авиация

avoid [ə'vɔɪd] *v* избегать

award [ə'wɔ:d] *n* награда; *v* награждать; **to be ~ed** получать награду

away [ə'weɪ] (**from**) *adv* далеко от, в стороне от, в сторону от

axis ['æksɪs] *n* (*pl axes*) ось (геометрическая)

axle ['æksl] *n* ось; вал, на котором вращаются колеса

В

back [bæk] *adv* обратно, назад

backup ['bæk'ʌp] *v* поддерживать; дублировать; *n* дублирование

- backward** ['bækwəd] *adv* в обратном направлении; *a* отсталый, обратный
- bag** [bæg] *n* мешок, сумка, чемодан
- balance** ['bæləns] *n* равновесие, весы; *~d a* уравновешенный
- balloon** [bə'lu:n] *n* воздушный шар, неуправляемый аэростат
- bank** [bæŋk] *n* берег, банк
- barrel** ['bærəl] *n* бочка, баррель (*мера жидких, сыпучих материалов*)
- base** [beɪs] *n* основание; *v* основывать; **to be ~d (on)** [tə bi: beɪst (on)] основываться на чем-либо
- basic** ['beɪsɪk] *a* основной
- basis** ['beɪsɪs] *n* основа, база
- battle** ['bætl] *n* битва, сражение, бой
- beam** [bi:m] *n* луч, пучок лучей, балка
- bearing** ['beərɪŋ] *n* подшипник
- beat** (**beat, beaten**) [bi:t, bi:t, bi:tn] *v* бить, победить; **to be ~en** проиграть
- beautiful** ['bju:təfʊl] *a* красивый, прекрасный
- because** [bi'kɔ:z] *conj* так как, потому что; *~ of prp* вследствие, из-за
- become** (**became, become**) [bi'kʌm, bi'keɪm, bi'kʌm] *v* становиться
- before** [bi'fɔ:] *adv* впереди, раньше; *prp* перед, до; *conj* прежде чем
- begin** (**began, begun**) [bi'gɪn, bi'gæn, bi'gʌn,] *v* начинать(ся); **to ~ with** прежде всего, во-первых, сначала
- beginning** [bi'gɪnɪŋ] *n* начало
- beg pardon** ['beg 'pɑ:dən] просить прощения, извиняться
- behaviour** [bi'heɪvjə] *n* поведение
- behind** [bi'haɪnd] *adv* сзади, после; *prp* за, сзади
- believe** [bi'li:v] *v* верить, полагать, считать
- belong** [bi'lɒŋ] *v* принадлежать, относиться к чему-либо
- below** [bi'ləu] *adv* ниже, внизу; *prp* под, ниже (*о качестве, положении*)
- belt** [belt] *n* пояс, ремень, зона
- bend** (**bent, bent**) [bend, bent] *v* изгибать(ся), сгибать(ся), гнуть; *n* сгиб, изгиб
- beneath** [bi'ni:θ] *adv* внизу; *prp* под, ниже
- benefit** ['benɪfɪt] *n* польза, выгода, благо; *v* получать, приносить пользу; извлекать пользу, выгоду
- binary** ['baɪnəri] *a* двоичный, бинарный
- besides** [bi'saɪdz] *adv, prp* помимо, кроме
- beyond** [bi'jɒnd] *prp* за пределами, вне
- bicycle** ['baɪsɪkl] *n* велосипед
- bike** [baɪk] *n* (сокр. от **bicycle**) велосипед
- bird** [bɜ:d] *n* птица
- bit** [bɪt] *n* кусочек, часть
- blade** [bleɪd] *n* лезвие, клинок, лопасть
- blank** [blæŋk] *a* пустой, свободный; *n* пропуск; *~ space* пустое (незаполненное) место
- blanket** ['blæŋkɪt] *n* шерстяное одеяло
- blow** (**blew, blown**) [bləu, blu:, bləʊn] *v* дуть; *n* удар
- board** [bɔ:d] *n* борт (*корабля*), доска; **on ~** на борту

body ['bɒdɪ] *n* тело, корпус, группа людей, состав, организация, административный орган; ~ **of a car** = **car body** кузов (автомобиля)

boil [bɔɪl] *v* кипятить(ся); кипеть

boiler ['bɔɪlə] *n* котел (паровой); бойлер

bomb [bɒm] *n* бомба; *v* бомбардировать

bone [bəʊn] *n* кость

booster ['buːstə] *n* ускоритель; **rocket** ~ стартовый (ракетный) ускоритель

border ['bɔːdə] граница; ~ **line** граница, пограничная зона

boredom ['bɔːdəm] *n* скука

born [bɔːn] **to be** ~ родиться

borrow ['bɒrəʊ] *v* занимать, заимствовать

both [bəʊθ] *pron* оба; *adv*, *cj* ~ ... **and** как ... так и; и ... и

bother ['bɒðə] *v* беспокоить, причинять беспокойство

bottom ['bɒtəm] *n* низ, дно, нижняя часть; *a* нижний

brain [breɪn] *n* мозг

brake [breɪk] *n* тормоз; *v* тормозить; **parking** ~ стояночный тормоз

branch [brɑːntʃ] *n* ветвь, отрасль

break (**broke**, **broken**) [breɪk, brəʊk, 'brəʊkən] ломать, разрушать; ~ **out** разразиться (о войне); *n* перерыв, пауза

breakthrough ['breɪk'θruː] *n* крупное достижение, открытие, шаг вперед, прорыв

bright [braɪt] *a* яркий, блестящий

brightness ['braɪtnɪs] *n* яркость

brilliant ['brɪljənt] *a* блестящий, великолепный

bring (**brought**, **brought**) [brɪŋ, brɔːt] *v* приносить, приводить, привозить; ~ **about** вызывать (какое-либо явление); ~ **in** вводить; ~ **to** доводить до

brittle ['brɪtl] *a* хрупкий, ломкий

broad [brɔːd] *a* широкий

bubble ['blʌbl] *n* пузырек воздуха или газа

build (**built**, **built**) [bɪld, bɪlt] *v* строить; ~ **up** построить, создать, составить

built-in *pp* встроенный

building ['bɪldɪŋ] *n* здание, строительство; *a* строительный

bumper ['bʌmpə] *n* бампер, амортизатор

bureau [bjʊə'reʊ] *n* бюро; отдел

burn (**burnt**, **burned**) [bɜːn, bɜːnt, bɜːnd] *v* гореть, сжигать; ~ **out** = ~ **up** сгорать; ~ **t gas** отработанный газ

businessman ['bɪznɪsmən] *n* деловой человек, коммерсант

but [bʌt] *adv* всего лишь; *ppp* кроме; *cj* но, а, однако

button ['bʌtn] *n* кнопка, пуговица

buy (**bought**, **bought**) [baɪ, bɔːt] *v* покупать

buzzer ['bʌzə] *n* гудок, сирена, звонок, зуммер

by [baɪ] *ppp* около, у, возле, к (определенному времени), до (определенного времени); ~ **all means** любыми (всеми) способами; ~ **day (night)** днем (ночью); ~ **means of** при помощи, посредством чего-либо; ~ **now** к настоящему времени; ~ **the beginning of** к началу; ~ **the end of** к концу; ~ **the middle of** к середине; ~ **that time** к тому времени; ~ **the time** к тому времени

как; ~ **the way** между прочим, кстати

by-product ['baɪprɒdʌkt] *n* побочный продукт

С

cabin ['kæbɪn] *n* кабина, каюта

cable ['keɪbl] *n* кабель

calcium ['kælsiəm] *n* кальций

calculate ['kælkjuleɪt] *v* считать, подсчитывать

calculation [ˌkælkjuˈleɪʃən] *n* вычисление, подсчет, расчет

call [kɔ:l] *n* сигнал, телефонный звонок; *v* называть; ~ **one's attention (to)** [ə'tenʃən] привлекать (обращать) чье-либо внимание на что-либо

called [kɔ:ld] *pp so* ~ так называемый

cancel ['kænsəl] *v* аннулировать, отменять

capability [ˌkeɪpəˈbɪlɪti] *n* способность

capable ['keɪpəbl] *a* способный; **to be** ~ быть в состоянии

capacity [kəˈpæsɪti] *n* производительность, мощность, способность

capital ['kæpɪtl] *n* столица

capture ['kæptʃə] *v* захватывать силой, захватить

car [kɑ:] *n* автомобиль, кар; ~ **body** кузов (*автомобиля*)

carbon ['kɑ:bən] *n* углерод

carburettor ['kɑ:bju:retə] *n* карбюратор

career [kəˈrɪə] *n* карьера

card [kɑ:d] *n* карточка

cardboard ['kɑ:dbɔ:d] *n* картон; *a* картонный

care [kɛə] *n, v* забота; **to take** ~ заботиться

careful ['keəfʊl] *a* тщательный, внимательный, осторожный

carefully ['keəflɪ] *adv* тщательно

cargo ['kɑ:gəu] *n* груз; *a* грузовой

carrier ['kæriə] *n* транспортный самолет, транспортер

carry ['kæri] *v* возить, носить, перевозить; ~ **out** проводить, выполнять работу (эксперимент); ~ **on** продолжать, вести дело

case [keɪs] *n* случай, судебное дело; **in (the)** ~ **of** в случае

cast (cast) [kɑ:st] *v* бросать, отбрасывать (*тень*)

catch (caught) [kæʃ, kɔ:t] *v* ловить, захватывать

cathode ['kæθəud] *n* катод; *a* катодный; ~ **ray** катодно-лучевой

cause [kɔ:z] *n* ~ дело, причина; *v* вызывать (какое-либо явление), доставлять, причинять

ceiling ['si:lɪŋ] *n* потолок

celebrity [sɪˈlebrɪti] *n* знаменитость, известность

celestial [sɪˈlestjəl] *a* небесный; ~ **body** небесное тело; ~ **mechanics** небесная механика

cell [sel] *n* элемент; ячейка; аккумулятор

cellular ['seljʊlə] *a* клеточный, ячеистый, сотовый; ~ **phone** сотовый телефон

centigrade ['sentɪgreɪd] *a* стоградусный, разделенный на сто градусов

central ['sentrəl] *a* центральный

centre ['sentə] *n* центр

centrifugal [senˈtrɪfjʊgəl] *a* центробежный

century ['sentʃʊri] *n* столетие, век

ceramic [sɪ'ræmɪk] *a* керамический

certain ['sə:tn] *a* некоторый, определенный; **to be** ~ быть уверенным

certainly ['sə:tnli] *adv* конечно

chain [tʃeɪn] *n* цепь

chamber ['tʃeɪmbə] *n* палата (*парламентская*), камера

chance [tʃɑ:ns] *n* случай, случайность, удача, возможность, вероятность, шанс

chancellor ['tʃɑ:nsələ] *n* канцлер

change [tʃeɪndʒ] *n* изменение, перемена; *v* менять(ся)

channel ['tʃænl] *n* пролив, канал, желоб

character ['kærɪktə] *n* знак, буква; характер

characteristic [kærɪktə'rɪstɪk] *n* характеристика; *a* характерный

charge [tʃɑ:ʒ] *n* заряд, топливная смесь (*в двигателе*), обязанность; **to be in** ~ **of** нести ответственность за что-либо; *v* заряжать; взимать плату

chassis ['ʃæsi] *n* шасси, рама (*автомобиль*)

cheap [tʃi:p] *a* дешевый

check up ['tʃek 'ʌp] *v* проверять; *n* проверка

chemical ['kemɪkl] *a* химический; *n* химический элемент, химикалий; ~ **composition** химический состав; ~ **engineering** химическое машиностроение

chemist ['kemɪst] *n* химик

chemistry ['kemɪstri] *n* химия

chess [tʃes] *n* шахматы

chief [tʃi:f] *n* начальник; *a* главный

chip [tʃɪp] *n* кристалл, интегральная схема

choice [tʃɔɪs] *n* выбор

choose (**chose**, **chosen**) [tʃu:z, tʃəuz, 'tʃəuzn] *v* выбирать

church [tʃə:tʃ] *n* церковь

circle ['sə:kl] *n* круг, кольцо, кружок; *v* обходить вокруг, вращаться

circuit ['sə:kɪt] *n* электрическая цепь

circuitry ['sə:kɪtri] *n* схемы

circular ['sə:kjələ] *a* круговой, кольцевой, дисковый

circumference [sə'klʌmfərəns] *n* окружность

circumstance ['sə:kəmstəns] *n* обстоятельство, случай

citizen ['sɪtɪzn] *n* гражданин

civil ['sɪvl] *a* гражданский; ~ **engineer** инженер-строитель; ~ **engineering** гражданское строительство

claim [kleɪm] *v* претендовать, заявлять

classify ['klæsɪfaɪ] *v* классифицировать

clean [kli:n] *a* чистый

clear [kliə] *a* ясный, понятный

clearly ['kliəli] *adv* ясно, отчетливо

click [klɪk] *n* щелчок; *v* щелкать

climate ['klaɪmɪt] *n* климат

close [kləʊs] *v* закрывать(ся); *a* близкий, пристальный

closely ['kləʊsli] *adv* тесно, вплотную; пристально, внимательно (*наблюдать*); ~ **related** тесно связанный

clothes [kləʊðz] *n, pl* одежда

coal [kəʊl] *n* уголь

coast [kəʊst] *n* морской берег, побережье

coat [kəʊt] *υ* покрывать (*краской и т.п.*); *n* покрытие, слой

code [kəʊd] *n* код; *υ* кодировать

coin [kɔɪn] *n* монета

coincide [ˌkəʊɪnˈsaɪd] *υ* совпадать

cold [kəʊld] *n* холод; *a* холодный

collect [kəˈlekt] *υ* собирать

college [ˈkɒlɪdʒ] *n* колледж; высшее специальное учебное заведение; ~ **training** обучение в высшем учебном заведении

collaboration [kəˌlæbəˈreɪʃən] *n* сотрудничество

collision [kəˈlɪʒən] *n* столкновение, коллизия

colour [ˈklɜː] *n* цвет, оттенок, тон

combination [ˌkɒmbɪˈneɪʃən] *n* сочетание, комбинация, соединение

combine [kəmˈbaɪn] *υ* соединять, сочетать, объединять; ~**d with** в сочетании с

combustion [kəmˈbʌstʃən] *n* сгорание

come (came, come) [kʌm, keɪm, kʌm] *υ* приходить; ~ **back** возвращаться; ~ **in** входить; ~ **through** проходить сквозь; проникать; ~ **to a conclusion** прийти к заключению; ~ **to light** появиться, вывестись; ~ **off** сходить

comet [ˈkɒmɪt] *n* комета

comfortable [ˈkʌmfətəbl̩] *a* удобный, уютный, комфортабельный

comforting [ˈkʌmfətɪŋ] *a* утешительный

commemorate [kəˈmeməreɪt] *υ* праздновать, отмечать, чтить память

comment [ˈkɒment] *n* замечание, отзыв; *υ* делать замечание, высказывать мнение

commerce [ˈkɒmə:s] *n* торговля, коммерция

commercial [ˈkəmə:ʃəl] *a* торговый, коммерческий; ~ **aviation** гражданская авиация

committee [kəˈmɪti] *n* комитет

common [ˈkɒmən] *a* обычный, всеобщий, общепринятый

commonly [ˈkɒmənli] *adv* обычно; ~ **used** широко используемый

communicate [kəˈmju:nikeɪt] (**with**) *υ* сообщаться, держать связь

communication [kəˈmju:nɪˈkeɪʃən] *n* связь, сообщение

community [kəˈmju:nɪti] *n* община, объединение, сообщество

compact [ˈkɒmpækt] *a* компактный, плотный; сплошной, массивный

compare [kəmˈpreɪ] *υ* сравнивать; (**as**) ~**d to** по сравнению с

competence [ˈkɒmpɪtəns] *n* способность, умение, компетентность

competition [ˌkɒmpɪˈtɪʃən] *n* соревнование, состязание, конкуренция

compiler [kəmˈpaɪlə] *n* составитель; компилятор

complete [kəmˈpli:t] *υ* завершать(ся), заканчивать(ся); *a* полный, законченный, готовый

completely [kəmˈpli:tli] *adv* полностью, целиком

completion [kəmˈpli:ʃən] *n* завершение, окончание

complex [ˈkɒmpleks] *a* сложный

complexity [kəmˈpleksɪti] *n* сложность

complicated [ˈkɒmplɪkeɪtɪd] *a* сложный

component [kəmˈpəʊnənt] *n* часть, деталь, компонент (*машины, уст-*

ройства); ~ **parts** составные части, компоненты (*машины*)

compose [kəm'pəuz] *у* составлять, **to be ~d of** состоять из

composite ['kɒmpəzɪt] *а* составной, сложный, композитный; *и* композиционный материал, композит

composition [kəm'pəzɪʃən] *и* состав, смесь; сочинение

comprehensive [kəm'prɪ'hensɪv] *а* всеобъемлющий, исчерпывающий, обширный

compress ['kəm'pres] *у* сжимать

compression ['kɒm'preʃən] *и* сжатие; ~-**ignition engine** дизель

comprise [kəm'praɪz] *у* включать в себя, состоять из

computation [kəm'pjʊ:'teɪʃən] *и* подсчет

compute [kəm'pjʊ:t] *у* вычислять, подсчитывать

computer [kəm'pjʊ:tə] *и* электронная вычислительная машина, ЭВМ, вычислительное устройство, компьютер

computing device [kəm'pjʊ:tɪŋ dɪ'vaɪs] счетно-решающее устройство

concentrate ['kɒnsəntreɪt] *у* сосредоточивать(ся), концентрировать(ся)

concept ['kɒnsept] *и* концепция, понятие

concern [kən'sə:n] *у* касаться, иметь отношение; заботиться, беспокоиться

conclusion [kən'klu:ʒən] *и* заключение

condenser [kən'densə] *и* конденсатор

condition [kən'dɪʃən] *и* условие, состояние

conduct [kən'dʌkt] *у* проводить (*ток*), вести; ['kɒndʌkt] *и* поведение

conductivity [kɒndʌk'tɪvɪtɪ] *и* проводимость

conference ['kɒnfərəns] *и* конференция

confidence ['kɒnfɪdəns] *и* доверие

confident ['kɒnfɪdənt] *а* уверенный, самоуверенный

confine [kən'faɪn] *у* ограничивать

confirm [kən'fə:m] *у* подтверждать, утверждать

connect [kə'nekt] *у* соединять

connection [kə'nekʃən] *и* связь, соединение, присоединение

conquer ['kɒŋkə] *у* завоевывать, покорять, подчинять; побеждать

consequence ['kɒnsɪkwəns] *и* следствие; **in ~ of** в результате, вследствие

consequently ['kɒnsɪkwəntli] *adv* следовательно

consider [kən'sɪdə] *у* считать, полагать, рассматривать, учитывать

considerable [kən'sɪdərəbl] *а* значительный; **a ~ distance ahead** на значительном расстоянии впереди

consideration [kən,sɪdə'reɪʃən] *и* расчет; **in ~ of** принимая во внимание; **take into ~** принимать во внимание, учесть (*в расчете*)

consist [kən'sɪst] (**of**) *у* состоять из, заключаться в чем-либо

constant ['kɒnstənt] *а* постоянный

constantly ['kɒnstəntli] *adv* постоянно, все время

constituent [kən'stɪtjuənt] *и* составная часть

constitute ['kɒnstɪtju:t] *у* составлять, основывать, учреждать

construct [kən'strʌkt] <i>в</i> строить, сооружать	cook [kuk] <i>в</i> стряпать, готовить пищу, варить
construction [kən'strʌkʃən] <i>н</i> строительство	cool [ku:l] <i>в</i> охлаждать; ~ down остывать
constructional [kən'strʌkʃənl] <i>а</i> конструктивный; ~ steel конструкционная сталь	coolant ['ku:lənt] <i>н</i> смазочно-охлаждающая жидкость
consumer [kən'sju:mə] потребитель	cooling ['ku:lɪŋ] <i>н</i> охлаждение
consumption [kən'sʌmpʃən] <i>н</i> потребление, расход	cooperation [kəʊ,pə'reɪʃən] <i>н</i> сотрудничество, совместные действия
contain [kən'teɪn] <i>в</i> содержать	coordinate [kəʊ'ɔ:dɪneɪt] <i>в</i> координировать, связывать
contaminant [kən'tæmɪnənt] <i>н</i> загрязняющее вещество	coordinated [kəʊ'ɔ:dɪneɪtɪd] <i>а</i> взаимосвязанный, согласованный
content ['kɒntent] <i>н</i> содержание, количество	copper ['kɒpə] <i>н</i> медь; <i>а</i> медный; ~ alloy медный сплав
continually [kən'tɪnjuəli] <i>adv</i> непрерывно, постоянно	copy ['kɒpi] <i>н</i> копия, экземпляр
continuation [kən,tɪnju'eɪʃən] <i>н</i> продолжение	corner ['kɔ:nə] <i>н</i> угол; ~ stone краеугольный камень
continue [kən'tɪnju:] <i>в</i> продолжать	corporation [,kɔ:pə'reɪʃən] <i>н</i> корпорация
continuous [kən'tɪnjuəs] <i>а</i> непрерывный	correct [kə'rekt] <i>в</i> исправлять; <i>а</i> правильный
contribute [kən'trɪbjʊ:t] <i>в</i> содействовать, способствовать; делать вклад	correlate ['kɒrɪleɪt] <i>в</i> соотносить(ся)
contribution [,kɒntrɪ'bju:ʃən] вклад	correspond [,kɒrɪs'pɒnd] <i>в</i> соответствовать
control [kən'trəʊl] <i>в</i> управлять, регулировать; <i>н</i> управление; ~ engineering техника управления; ~ station (unit) управляющее устройство	corresponding [,kɒrɪs'pɒndɪŋ] <i>а</i> соответствующий
controlled [kən'trəʊld] <i>а</i> управляемый, регулируемый	cost (cost) [kɒst] <i>в</i> стоить; <i>н</i> стоимость, цена
controls [kən'trəʊlz] <i>н</i> приборы управления, пульт управления	council ['kaʊnsɪl] <i>н</i> совет
convenient [kən'vi:njənt] <i>а</i> удобный	country ['kʌntri] <i>н</i> страна
conventional [kən'venʃənl] <i>а</i> обычный, общепринятый, традиционный	countryside ['kʌntrɪsaɪd] <i>н</i> сельская местность
convert [kən'vɜ:t] <i>в</i> преобразовывать, превращать	course [kɔ:s] <i>н</i> течение, ход, курс (<i>наук</i>); ~ of lectures курс лекций; ~ of studies курс обучения; training ~ курс подготовки; in the ~ of в ходе ..., в процессе чего-либо

cover ['kʌvə] *υ* покрывать, укрывать, охватить, пройти (*программу*), ~ **the course** пройти курс

craft [krɑ:ft] *n* ремесло, умение, искусство; суда любого назначения, самолет

create [kri:'eɪt] *υ* создавать, творить

creation [kri:'eɪʃən] *n* создание

creature ['kri:tʃə] *n* живое существо, создание

crew [kru:] *n* судовая команда, экипаж

critical ['kritɪkəl] *a* критический; ~ **point** [pɔɪnt] критическая точка; ~ **temperature** ['temprɪtʃə] критическая температура

cross [krɒs] *υ* пересекать, переходить; ~-**section** поперечное сечение

cruising ['kru:zɪŋ] ~ **speed** средняя скорость, скорость установившегося движения, крейсерская скорость

cryogenic ['kraɪəu'dʒenɪk] *a* охлаждающий

crystal ['krɪstl] *n* кристалл; *a* хрустальный

crystalline ['krɪstəlɪn] *a* кристаллический; прозрачный

cultivate ['kʌltɪveɪt] *υ* возделывать, культивировать

cultivation [kʌltɪ'veɪʃən] *n* возделывание, разведение

current ['kʌrənt] *n* ток (*электрический*); *a* современный, текущий, нынешний

currently ['kʌrəntli] *adv* сейчас, в настоящее время

curriculum [kə'ɪrɪkjuləm] (*pl curricula*) *n* курс обучения, учебный план

cushion ['kuʃən] *n* подушка

cycle ['saɪkl] *n* цикл

D

daily ['deɪli] *a* ежедневный; *adv* ежедневно

damage ['dæmɪdʒ] *n* повреждение

danger ['deɪndʒə] *n* опасность

dangerous ['deɪndʒərəs] *a* опасный

dark [dɑ:k] *a* темный

darken ['dɑ:kən] *υ* затемнять; ~**ed** затемненный

dash [dæʃ] *n* черта, тире, штрих

data ['deɪtə] *n, pl* данные (от **datum** ['deɪtəm])

date back ['deɪt 'bæk] *υ* относиться (*к определенной эпохе*)

day [deɪ] *n* день; ~ **before yesterday** позавчера, накануне; ~ **by** ~ день за днем; **one** ~ однажды; ~ **off** свободный день

deal (dealt) [di:l, delt] *υ* (**with**) иметь дело с; **a good** ~ довольно много, значительно

dean [di:n] *n* декан

death [deθ] *n* смерть

decade ['dekeɪd] *n* десятилетие

decide [dɪ'saɪd] *υ* решать

decision [dɪ'sɪʒən] *n* решение, заключение, решимость; **to make a** ~ принять решение

declare [dɪ'kleə] *υ* заявлять, объявлять

decline [dɪ'klaɪn] *υ* отклонить (*предложение*)

decorate ['dekəreɪt] *υ* украшать, отделывать (*дом*)

decrease [di:'kri:s] *υ* уменьшать(ся); *n* ['di:kri:s] уменьшение

defect [dɪ'fekt] *n* дефект, недостаток

defend [dɪ'fend] *n* защищать(ся)

define [dɪ'faɪn] *υ* определять, давать определение, устанавливать

definite [ˈdefɪnɪt] *a* определенный, точный, отчетливый

definition [ˌdefɪˈnɪʃən] *n* определение; резкость, четкость (*техн.*)

degree [dɪˈɡri:] *n* градус, степень;
to get a ~ получить ученую степень

delay [dɪˈleɪ] *n* задержка, препятствие, замедление, промедление;
v откладывать, отсрочивать; задерживать, препятствовать

deliver [dɪˈlɪvə] *v* представлять, доставлять; ~ **a lecture** прочитать лекцию; ~ **a report** сделать доклад

demand [dɪˈmɑːnd] *v* требовать; *n* требование

demonstrate [ˈdemənstreɪt] *v* демонстрировать, показывать

demonstration [ˌdemənsˈtreɪʃən] *n* демонстрация, показ

dense [dens] *a* плотный, насыщенный

density [ˈdensɪtɪ] *n* плотность, удельный вес

deny [dɪˈnaɪ] *v* отрицать, отрекаться

department [dɪˈpɑːtmənt] *n* отдел, отделение, факультет, цех

depend [dɪˈpend] (**on, upon**) *v* зависеть (от); ~**ing on** в зависимости

dependence [dɪˈpendəns] *n* зависимость

dependent [dɪˈpendənt] *a* зависимый; **to be ~ on** зависеть (от)

deposit [dɪˈpɒzɪt] *n* залежь, месторождение

depression [dɪˈpreʃən] *n* снижение, падение (*давления*); депрессия, угнетенное состояние

depth [depθ] *n* глубина

derive [dɪˈraɪv] *v* устанавливать (выводить) закон (происхождение)

descend [dɪˈsend] *v* опускаться

descendant [dɪˈsendənt] *n* потомок

descent [dɪˈsent] *n* спуск

describe [dɪsˈkraɪb] *v* описывать, изображать, характеризовать, называть; **to be ~ed as** называться

description [dɪsˈkrɪpʃən] *n* описание, обозначение, вид, тип

descriptive [dɪsˈkrɪptɪv] *a* описательный; ~ **geometry** начертательная геометрия

design [dɪˈzaɪn] *v* конструировать, проектировать, предназначать; *n* проект, план, расчет, конструкция, эскиз; ~ **office** конструкторское бюро

desirable [dɪˈzaɪərəbl̩] *a* желательный

desire [dɪˈzaɪə] *v* желать, ~**ed** желательный, желаемый; *n* желание

desk [desk] *n* письменный (рабочий) стол

despite [dɪsˈpaɪt] *prp* несмотря на, вопреки

destination [ˌdestɪˈneɪʃən] *n* место назначения, цель (*путешествия*)

destroy [dɪsˈtrɔɪ] *v* разрушать, уничтожать

destruction [dɪsˈtrʌkʃən] *n* разрушение

detail [ˈdiːteɪl] *n* подробность; *a* ~**ed** подробный

detect [dɪˈtekt] *v* обнаруживать, выявлять

detection [dɪˈtekʃən] *n* обнаружение, выявление, распознавание

determination [dɪˌtɜːmɪˈneɪʃən] *n* определение

determine [dɪ'tə:mɪn] *в* определять, устанавливать

develop [dɪ'veləp] *в* развивать, разрабатывать, создавать, проявлять (*фото*)

development [dɪ'veləpmənt] *н* создание, разработка, развитие, достижение, открытие

deviation [di:vɪ'eɪʃən] *н* отклонение, девиация

device [dɪ'vaɪs] *н* устройство, механизм, прибор

devote [dɪ'vəʊt] *в* посвящать; ~ **one's attention (to)** уделять внимание

diagonal [daɪ'æɡənəl] *а* диагональный, идущий наискосок

diagram ['daɪəɡræm] *н* диаграмма

dial ['daɪəl] *н* циферблат, круговая шкала, диск

diameter [daɪ'æmɪtə] *н* диаметр

dictionary ['dɪkʃənəri] *н* словарь

die [daɪ] *н* штамп, матрица, пуансон

differ ['dɪfə] *в* отличаться (*от*)

difference ['dɪfrəns] *н* отличие, разница

different ['dɪfrənt] *а* различный, иной, другой, неодинаковый; **to be ~ from** отличаться от; **to be of ~ composition** иметь иной (другой) состав

differential [dɪfə'renʃəl] *а* дифференциальный; ~ **equation** дифференциальное уравнение

difficult ['dɪfɪkəlt] *а* трудный

difficulty ['dɪfɪkəltɪ] *н* трудность, затруднение

digital ['dɪdʒɪtl] *а* цифровой

dime [daɪm] *н* монета в 10 центов

dimension [dɪ'menʃən] *н* измерение; ~s размеры, величина, объем, протяжение

direct [dɪ'rekt] *в* руководить, направлять; *а* прямой, непосредственный; **in ~ consequence** как прямое следствие

direction [dɪ'rekʃən] *н* направление

directly [dɪ'rektlɪ] *adv* прямо, непосредственно

disadvantage [dɪsəd'vɑ:ntɪdʒ] *н* недостаток

disagree [dɪsə'ɡri:] *в* не соглашаться

disappear [dɪsə'piə] *в* исчезать

disappoint [dɪsə'pɔɪnt] *в* разочаровываться

disappointment [dɪsə'pɔɪntmənt] *н* разочарование

discourage [dɪs'kʌrɪdʒ] *в* обескураживать, расхолаживать

disconnect ['dɪskə'nekt] *в* разъединять

discover [dɪs'klʌvə] *в* открывать, обнаруживать

discovery [dɪs'klʌvəri] *а* открытие

discuss [dɪs'kʌs] *в* обсуждать

discussion [dɪs'kʌʃən] *н* обсуждение

disintegrate [dɪs'ɪntɪɡreɪt] *в* разделять(ся) на составные части, дезинтегрировать, раздроблять, разрушаться

disobey ['dɪsə'beɪ] *в* не слушать(ся)

disorder [dɪs'ɔ:də] *н* беспорядок

display [dɪs'pleɪ] *в* показывать, выставлять, демонстрировать; *н* показ, выставка, выставление напоказ, дисплей

disposal [dɪs'pəʊzəl] *н* избавление (*от* чего-либо), устранение, удаление

distance ['distəns] *n* расстояние; **a long ~ ahead** далеко впереди, на большое расстояние вперед

distant ['distənt] *a* отдаленный; ~ **controlled** с дистанционным управлением

distinct [dis'tɪŋkt] *a* отчетливый, ярко выраженный

distinguish [dis'tɪŋɡwɪʃ] *v* различать, распознавать, характеризовать, отличать

distort [dis'tɔ:t] *v* искажать, извращать

distribute [dis'tribju:t] *v* распределять, размещать

distribution [ˌdɪstrɪ'bju:ʃən] *n* распределение, размещение

district ['dɪstrɪkt] *n* район

divide [dɪ'vaɪd] *v* делить

dividend ['dɪvɪdend] *n* доход, прибыль, дивиденд

division [dɪ'vɪʒən] *n* деление

domestic [dəu'mestɪk] *a* домашний, семейный, внутренний, отечественный

dominant ['dɒmɪnənt] *a* господствующий, доминирующий, преобладающий

dormitory ['dɔ:mitrɪ] *n* спальня, спальный корпус, общежитие

dot [dɒt] *n* точка

double ['dʌbl] *v* удваивать; *a* двойной

doubt [daʊt] *n* сомнение

down [daʊn] *adv* вниз

dozen ['dʌzn] *a* дюжина

drag [dræg] *v* тащить(ся) (*c усилением*), тянуть(ся)

draw (**drew, drawn**) [drɔ:, dru:, drɔ:n] *v* чертить, рисовать, проводить линию; тянуть, натягивать

drawing ['drɔ:ɪŋ] *n* рисунок, рисование, черчение

dream [dri:m] *n* мечта; (**dreamt or dreamed**) [dremt, dremd] *v* мечтать

drill [drɪl] *v* сверлить; *n* сверло

drive (**drove, driven**) [draɪv, drəʊv, 'drɪv] *v* ездить (*на автомобиле*); приводить в движение; ~ **a car** водить автомобиль; *n* поездка (*на автомобиле*)

drive [draɪv] *n* привод; дисковод; накопитель

driver [draɪvə] *n* водитель

drop [drɒp] *v* бросать, оставлять; ~ **the idea** перестать думать, отказаться от мысли; *n* капля

drum [drʌm] *n* барабан

dry [draɪ] *a* сухой

due to ['dju: tu] *prp* из-за, благодаря, вследствие; **to be ~ to** являться результатом чего-либо; **to be ~** направляться куда-либо

duration [dʒuə'reɪʃən] *n* продолжительность

during ['dʒuərɪŋ] *prp* в течение, во время

Dutch [dʌʃ] *a* нидерландский, голландский

duty ['dju:ti] *n* долг, обязанность; **off ~** вне службы, свободный от работы

Е

each [i:tʃ] каждый; ~ **of** каждый из; ~ **one** каждый; ~ **other** друг друга; ~ **time** каждый раз; ~ **year** каждый год, ежегодно

early ['ɜ:lɪ] *a* ранний; *adv* рано; ~ **in 19...** в начале 19...; **as ~ as** еще (так давно, как)

earth [ə:θ] *n* земля

easily ['i:zɪlɪ] *adv* легко

easy ['i:zɪ] *a* легкий; *adv* легко

ecological [ekə'lɒdʒɪkəl] *a* экологический

ecology [ɪ'kɒlədʒɪ] *n* экология

economical [i:kə'nɒmɪkəl] *a* экономический; *~ly* [i:kə'nɒmɪkəlɪ] *adv* экономически, экономно

economy [ɪ'kɒnəmi] *n* экономика; экономия

edge [edʒ] *n* кромка, край, лезвие

editing ['editɪŋ] *n* монтаж; редактирование; **video** ~ видеомонтаж

educate ['edju:keɪt] *v* обучать, давать образование, воспитывать; *~d* образованный; **to be** *~d* иметь образование, быть образованным

education [edju:'keɪʃən] *n* образование

effect [ɪ'fekt] *n* действие, влияние, воздействие, последствия, результат; *v* воздействовать, осуществлять

effective [ɪ'fektɪv] *a* удачный, успешный, эффективный; *~ means* эффективный способ

efficiency [ɪ'fɪʃənsɪ] *n* КПД, производительность

efficient [ɪ'fɪʃənt] *a* эффективный, продуктивный, с высоким коэффициентом полезного действия

effort ['efət] *n* усилие

elect [ɪ'lekt] *v* выбирать, избирать

electric [ɪ'lektrɪk] *a* электрический; *~ conductivity* электропроводность; *~ current* электрический ток

electrical [ɪ'lektrɪkəl] *a* *~ engineer* инженер-электрик; *~ engineering*, электротехника

electricity [ɪlek'trɪsɪti] *n* электричество

electron [ɪ'lektrɒn] *n* электрон

electronic [ɪlek'trɒnɪk] *a* электронный

electronics [ɪlek'trɒnɪks] *n* электроника

element ['elɪmənt] *n* элемент, часть, узел; *~s of machines* детали машин

elemental [elɪ'mentl] *a* основной, начальный, элементарный

elementary [elɪ'mentəri] *a* простой, элементарный

elevator ['elɪveɪtə] *n* подъемник, лифт

eliminate [ɪ'lɪmɪneɪt] *v* устранять, исключать, ликвидировать

elongate ['i:lɒŋgeɪt] *v* растягивать(ся), удлинять(ся), продлевать (*срок*)

else [els] *adv* еще

emission [ɪ'mɪʃən] *n* выделение, распространение, эмиссия

emit [ɪ'mɪt] *v* испускать, излучать, выделять

empire ['empaɪə] *n* империя

employ [ɪm'plɔɪ] *v* использовать, употреблять, применять

empty ['emptɪ] *a* пустой

enable [ɪ'neɪbl] *v* помогать, давать возможность

enclose [ɪn'kləʊz] *v* вкладывать (*в письмо и т.п.*), помещать, заключать (*внутри чего-либо*)

encode [ɪn'kəʊd] *v* кодировать, шифровать

encounter [ɪn'kaʊntə] *v* встретить(ся), сталкиваться

end [end] *v* кончать, кончаться; *n* конец

enemy ['enɪmi] *n* враг; *a* вражеский

energy ['enədʒɪ] *n* энергия, сила

engine ['endʒɪn] *n* двигатель, мотор; **jet** ~ реактивный двигатель; **ventilator** ~ турбовентиляторный двигатель; **propeller** ~ пропеллерный двигатель

engineer [ˌendʒɪˈniə] *n* инженер, механик, машинист

engineering [ˌendʒɪˈniəriŋ] *n* техника, строительное дело, машиностроение, конструирование

enjoy [ɪnˈdʒɔɪ] *v* получать удовольствие, наслаждаться

enlarge [ɪnˈlɑːdʒ] *v* увеличивать(ся), расширять(ся)

enormous [ɪˈnɔːməs] *a* огромный, колоссальный

enough [ɪˈnʌf] *adv* достаточно, довольно

enrol(l) [ɪnˈrəʊl] *v* зачислять, вносить в списки; **to be ~ed** быть зачисленным (*в списки*)

enrolment [ɪnˈrəʊlmənt] *n* прием (*новых членов*), регистрация, внесение в списки

ensure [ɪnˈʃʊə] *v* обеспечивать, гарантировать

enter [ˈentə] *v* входить, поступать (*в учебное заведение*)

enterprise [ˈentəpraɪz] *n* предприятие

entire [ɪnˈtaɪə] *a* весь, целый, полный

entirely [ɪnˈtaɪəli] *adv* всецело, полностью, совершенно

entrance [ˈentrəns] *n* вход, поступление; ~ **examinations** вступительные экзамены

entrust [ɪnˈtrʌst] *v* поручать, вверять, оказать доверие

envelope [ˈenvələʊp] *n* конверт, оболочка

environment [ɪnˈvaɪərənmənt] *n* окружение, окружающая среда

environmental [ɪnˈvaɪərənˈmɛntl] *a* относящийся к окружающей среде

envisage [ɪnˈvɪzɪdʒ] *v* рассматривать, предусматривать, смотреть прямо в глаза

equal [ˈiːkwəl] *a* равный, одинаковый; *v* равняться

equation [ɪˈkweɪʃən] *n* уравнение

equip [ɪˈkwɪp] *v* оборудовать, оснащать, снабжать

equipment [ɪˈkwɪpmənt] *n* оборудование

equivalent [ɪˈkwɪvələnt] *n* эквивалент; *a* равноценный, равный по величине (значению), эквивалентный

era [ˈɪərə] *n* эра, эпоха

erase [ɪˈreɪz] *v* стирать; вычеркивать (*из памяти*)

error [ˈerə] *n* ошибка, заблуждение

escalator [ˈeskəleɪtə] *n* эскалатор

escape [ɪsˈkeɪp] *v* выходить, вырываться, ускользать, давать утечку

especially [ɪsˈpeʃəli] *adv* особенно, специально

essential [ɪˈsenʃəl] *a* основной, существенный

essentially [ɪˈsenʃəli] *adv* в основном, по существу

establish [ɪsˈtæblɪʃ] *v* устанавливать, учреждать, основывать

establishment [ɪsˈtæblɪʃmənt] *n* установление, учреждение

estimate [ˈestɪmeɪt] *v* определять, оценивать; [ˈestɪmɪt] *n* оценка

etc. (*сокр. лат. et cetera*) = **and so on** и так далее

evaluate [ɪˈvæljuːeɪt] *v* оценивать, определять

even ['i:vən] *adv* даже

event [ɪ'vent] *n* событие, случай

eventually [ɪ'ventʃəli] *adv* в конечном счете, в конце концов; со временем

evidence ['evidəns] *n* очевидность, свидетельство, основание

evident ['evidənt] *a* очевидный, ясный

exact [ɪg'zækt] *a* точный

examination [ɪg,zæmɪ'neɪʃən] *n* экзамен, проверка

examine [ɪg'zæmɪn] *v* осматривать, проверять

example [ɪg'zɑ:mpəl] *n* пример; **for** ~ например

exceed [ɪk'si:d] *v* превышать, превосходить

excellent ['eksələnt] *a* отличный, превосходный

except [ɪk'sept] *prp* за исключением, исключая; ~ **for** за исключением; ~ **that** за исключением (не считая) того, что

exception [ɪk'sepʃən] *n* исключение

exceptional [ɪk'sepʃənəl] *a* исключительный

exceptionally [ɪk'sepʃənli] *adv* исключительно

excess [ɪk'ses] *n* избыток; *a* лишний

exchange [ɪks'tʃeɪndʒ] *n* обмен

exchanger [ɪks'tʃeɪndʒə] *n* **heat** ~ теплообменник

exclude [ɪks'klu:d] *v* исключать

excuse [ɪks'kju:s] *v* извинять, прощать

exercise ['eksəsaɪz] *n* упражнение

exert [ɪg'zə:t] *v* оказывать (*действие, влияние*), прилагать (*усилие*)

exhaust [ɪg'zɔ:st] *n* выхлопной; ~ **gas** выхлопной (отработанный) газ; ~ **pipe** выхлопная труба

exhibition [,eksɪ'biʃən] *n* выставка

exist [ɪg'zɪst] *v* существовать

existence [ɪg'zɪstəns] *n* существование

expand [ɪks'pænd] *v* расширять(ся)

expansion [ɪks'pænʃən] *n* расширение, растяжение, распространение

expect [ɪks'pekt] *v* ожидать, ждать, предполагать, надеяться, думать

expensive [ɪks'pensɪv] *a* дорогой, дорогостоящий

experience [ɪks'piəriəns] *n* (приобретенный) опыт; ~**d** *a* опытный

experiment [ɪks'perɪmənt] *n* опыт, эксперимент; *v* делать опыты, экспериментировать

experimental [eks,perɪ'məntl] *a* экспериментальный, основанный на опыте

explain [ɪks'pleɪn] *v* объяснять

explanation [,eksplə'neɪʃən] *n* объяснение

explode [ɪks'pləʊd] *v* взрываться

exploit [ɪks'plɔɪt] *v* эксплуатировать, разрабатывать

exploration [,eksplɔ:'reɪʃən] *n* исследование

explore [ɪks'plɔ:] *v* исследовать

explorer [ɪks'plɔ:rə] *n* исследователь

explosion [ɪks'pləʊzən] *n* взрыв, вспышка

explosive [ɪks'pləʊsɪv] *a* взрывчатый; *n* взрывчатая смесь

expose [ɪks'pəʊz] *v* подвергать (*действию*)

express [ɪks'pres] *v* выражать

extend [ɪks'tend] *υ* простираться, распространяться, выступать (за пределы чего-либо)

extensive [ɪks'tensɪv] *a* обширный, пространный

extent [ɪks'tent] *n* степень, мера

external [ɪks'tə:nl] *a* внешний, наружный

extract [ɪks'trækt] *υ* извлекать

extreme [ɪks'tri:m] *a* крайний, чрезвычайный, экстремальный

extremely [ɪks'tri:mli] *adv* чрезвычайно, крайне, очень

F

fable ['feɪbl] *n* басня, миф

fabricate ['fæbrɪkeɪt] *υ* производить, изготавливать

fabricating ['fæbrɪkeɪtɪŋ] *n* изготовление, производство; ~ **processes** производственные процессы

fabrication [fæbrɪ'keɪʃən] *n* производство, изготовление

face [feɪs] *n* лицо, поверхность, грань; *υ* стоять лицом к чему-либо, сталкиваться с чем-либо

facilitate [fə'sɪlɪteɪt] *υ* облегчать

facility [fə'sɪlɪtɪ] *n* оборудование, приспособление, аппаратура

fact [fækt] *n* факт; *in* ~ в действительности

factory ['fæktəri] *n* завод, фабрика; ~ **grounds** территория завода

faculty ['fækəltɪ] *n* факультет; преподавательский состав факультета (*амер.*)

fail [feɪl] *υ* разрушаться, ломаться, не выполнять чего-либо, не суметь сделать чего-либо, провалиться на экзамене

failure ['feɪljə] *n* разрушение, повреждение, выход из строя

fair [fɛə] *n* ярмарка

fall (**fell**, **fallen**) [fɔ:l, fel, 'fɔ:ln] *υ* падать, понижаться; *n* падение; осень (*амер.*)

fame [feɪm] *n* слава, известность

familiar [fə'mɪljə] *a* ~ хорошо знакомый, известный, близкий; **to be** ~ **with** хорошо знать что-либо

family ['fæmɪli] *n* семья, семейство

famous ['feɪməs] *a* знаменитый

fan [fæn] *n* вентилятор

fantastic [fæn'tæstɪk] *a* фантастический, невероятный

far [fɑ:] *a* далекий, дальний; *adv* далеко; ~ **away** далеко; **as** ~ **back** **as** еще в ... (*году*)

farther ['fɑ:ðə] *a* дальнейший, более отдаленный

fashion ['fæʃən] *n* стиль, мода; манера, способ

fast [fɑ:st] *a* быстрый; *adv* быстро; ~ **acting** = ~ **operating** быстродействующий

fasten ['fɑ:sn] *υ* прикреплять, привязывать, сжимать

fault [fɔ:lt] *n* недостаток, дефект; повреждение, неисправность

favourite ['feɪvərɪt] *a* любимый

fear [fiə] *n* страх, боязнь, опасение

feature ['fi:tʃə] *n* особенность, характерная черта

feed (**fed**) [fi:d, fed] *υ* питать, подавать (*топливо, сырье*); *n* подача (*материала*), питание

feel (**felt**) [fi:l, felt] *υ* чувствовать, сознавать, ощущать

feeling ['fi:lɪŋ] *n* чувство, ощущение, сознание

female ['fi:meɪl] *a* женский

ferromagnetic ['ferəʊmæg'netɪk] *a* ферромагнитный

few [fju:] *adv* мало; **a** ~ несколько, небольшое (*число*)

fibre ['faɪbə] *n* волокно, нить; ~ **structure** волокнистая структура; ~ **glass** стекловолокно

fiction ['fɪkʃən] *n* беллетристика, художественная литература; вымысел

field [fi:ld] *n* область, отрасль, поле (*электрическое*)

fight (fought) [faɪt, fɔ:t] *v* бороться; *n* борьба

fill [fɪl] *v* наполнять(ся); заполнять; ~ **in** заполнять

film [fɪlm] *n* пленка, легкий слой, оболочка; фильм

final ['faɪnəl] *a* окончательный, последний, заключительный; *n* ~s выпускной экзамен

finally ['faɪnəli] *adv* наконец, в заключение, в конце концов

find (found) [faɪnd, faund] *v* находить; ~ **out** выяснить, обнаружить, понять

finger ['fɪŋɡə] *n* палец

finish ['fɪnɪʃ] *v* заканчивать

firearm ['faɪəɹɑ:m] *n* огнестрельное оружие

first [fɜ:st] *a* первый; **at** ~ сперва, на первых порах, вначале; *adv* сначала, прежде всего, впервые

fisherman ['fɪʃəmən] *n* рыбак

fit [fɪt] *v* приспособливать, прилаживать, подгонять; ~ **with** снабжать, оборудовать чем-либо

fix [fɪks] *v* устанавливать, закреплять; ~**ed** неподвижный

flame [fleɪm] *n* пламя

flat [flæt] *a* плоский; ~ **battery** разряженный аккумулятор

flexible ['fleksəbl] *a* гибкий, гнущийся, эластичный

flight [flaɪt] *n* полет, перелет

flirt [flɜ:t] *v* флиртовать, кокетничать

float [fləʊt] *v* плавать, держаться на поверхности воды; *n* поплавок

floor [flɔ:] *n* этаж, пол

flow [fləʊ] *v* течь, истекать; *n* течение

flower ['flaʊə] *n* цветок, цветение; *v* цвести

fluid ['flu:ɪd] *n* жидкость; *a* жидкий

fly (flew, flown) [flaɪ, flu:, fləʊn] *v* летать; ~ **up** взлететь

flying ['flaɪɪŋ] *n* полет(ы); *a* летательный; ~ **machine** летательный аппарат

flywheel ['flaɪwi:l] *n* маховое колесо

focus ['fəʊkəs] *n* (*pl* foci) фокус, центр

follow ['fɒləʊ] *v* следовать (*за*), следить, наблюдать (*за*), **as** ~s следующим образом

follower ['fɒləʊə] *n* последователь

following ['fɒləʊɪŋ] *a* следующий; **the** ~ **day** на следующий день; **the** ~ **year** в будущем году; **in the** ~ **way** следующим образом

food [fu:d] *n* пища, питание, еда

for [fɔ:] *prp* для, за, в течение; ~ **a long time** в течение долгого времени; ~ **a number of years** в течение ряда лет; ~ **example**, ~ **instance** например; ~ **the first time** впервые; ~ **good** навсегда; *сj* так как

force [fɔ:s] *n* сила, действие; *v* давить, заставлять, вынуждать; **to be** ~**d** быть вынужденным

foreign ['fɔ:ɪn] *a* иностранный, посторонний

forest ['fɔ:ɪst] *n* лес

forget (forgot, forgotten) [fə'get, fə'gɒt, fə'gɒtn] *v* забывать

fork [fɔ:k] *n* вилка

form [fɔ:m] *v* придавать (принимать) форму, образовывать; *n* форма, вид; **in the ~ of** в виде

formal ['fɔ:məl] *a* формальный, официальный

former ['fɔ:mə] *a* прежний, бывший, первый (*из двух*); **the ~ ... the latter** первый ... последний

formula ['fɔ:mjələ] (*pl* **formulae** ['fɔ:mjuli:]) *n* формула

formulate ['fɔ:mjuleɪt] *v* формулировать

fortification [fɔ:tɪfɪ'keɪʃən] *n* укрепление, фортификация

fortune ['fɔ:tʃən] *n* богатство, состояние, удача

forward ['fɔ:wəd] *a* передовой, передний; *adv* вперед

fossil ['fɒsl] *n* окаменелость, ископаемое

found [faʊnd] *v* основывать

foundation [faʊn'deɪʃən] *n* основание

founder ['faʊndə] *n* основатель, основоположник

fraction ['frækʃən] *n* доля, часть, дробь

frame [freɪm] *n* рама

free [fri:] *a* свободный, бесплатный; **~ of charge** бесплатно

freedom ['fri:dəm] *n* свобода

freight [freɪt] *n* груз; *a* грузовой; **~ transport** грузовые перевозки

frequency ['fri:kwənsɪ] *n* частота; частотность

frequent ['fri:kwənt] *a* частый; часто посещаемый

frequently ['fri:kwəntli] *adv* часто

freshman ['freʃmən] *n* первокурсник

friction ['frɪkʃən] *n* трение

front [frʌnt] *a* передний; *n* передняя сторона, фасад; **in ~ of** перед, впереди

frost [frɒst] *n* мороз, иней

fruitful ['fru:tful] *a* плодovitый, плодотворный

fuel [fjuəl] *n* топливо

fulfil [ful'fɪl] *v* выполнять

full [ful] *a* полный

fully ['fʊli] *adv* полностью

furnace ['fə:nɪs] *n* печь, топка

further ['fə:ðə] *a* более дальний, дальнейший, добавочный

G

game [geɪm] *n* игра

gap [gæp] *n* пропуск, пробел, пустое место

gas [gæs] *n* газ, бензин (*амер.*); *a* газовый

gasolene ['gæsəʊli:n] *n* бензин; **~ powered** бензиновый, работающий на бензине

gather ['gæðə] *v* собирать, собираться, скапливаться

gear [gɪə] *n* шестерня, зубчатая передача; **~ wheel** зубчатое колесо, передача

general ['dʒenərəl] *a* общий, главный, основной; **~ engineering subjects** общетехнические дисциплины; **in ~** вообще

generally ['dʒenərəli] *adv* обычно, вообще; **~ speaking** вообще говоря

generate ['dʒenəreɪt] *v* вырабатывать, производить, создавать

generation [dʒenə'reɪʃən] *n* поколение; получение, производство

generator ['dʒenəreɪtə] *n* генератор
genius ['dʒi:njəs] *n* гений
gently ['dʒentli] *adv* мягко, вежливо
geography [dʒɪ'ɒɡrəfi] *n* география
get (got) [get, ɡɒt] *v* получать, достигать; ~ **an idea** получить представление; ~ **back** вернуться; ~ **interested** заинтересоваться; ~ **lost** потеряться, заблудиться; ~ **off** выходить, сходить; ~ **out** выходить; ~ **ready** готовиться, приготовить(ся); ~ **sure** убедиться; ~ **up** встать; взобраться
giant ['dʒaɪənt] *a* громадный, исполинский
go (went, gone) [ɡəʊ, went, ɡɒn] *v* ходить, ездить; ~ **away** уходить; ~ **down** опускаться; ~ **on** продолжать, происходить; ~ **out** выходить; ~ **over (to smb.)** пойти к кому-либо, перейти; ~ **through the university** окончить университет; **it goes without saying** само собой разумеется; **to be going + Infinitive** собираться сделать что-то
gold [ɡəʊld] *n* золото, *a* золотой
good [ɡʊd] *a* хороший; *a* ~ **deal of** много; **for** ~ навсегда; ~ **luck** желаю удачи
govern ['ɡʌvən] *v* управлять, определять
government ['ɡʌvnmənt] *n* правительство
gown [gaʊn] *n* мантия (*судьи*)
graduate ['ɡrædjueɪt] *v* окончить (учебное заведение); ['ɡrædjuət] *n* выпускник учебного заведения
graduation [ˌɡrædju'eɪʃən] *n* окончание; ~ **project** дипломный проект
gram [ɡræm] *n* грамм
grant [ɡrɑ:nt] *n* стипендия; *v* давать, разрешать, предоставлять; ~

a degree присуждать ученую степень
gravitation [ˌɡrævɪ'teɪʃən] *n* притяжение, тяготение
gravity ['ɡrævɪti] *n* сила тяжести, земное притяжение
great [ɡreɪt] *a* большой, великий, крупный; *a* ~ **number of** очень много, большое число; **to be of ~ importance** иметь большое значение; **to be of ~ interest** представлять большой интерес
greatly ['ɡreɪtli] *adv* очень, значительно, в значительной степени
greet [ɡri:t] *v* приветствовать, здороваться
group [ɡru:p] *n* группа, тип
grow (grew, grown) [ɡrəʊ, ɡru:, ɡrəʊn] *v* расти; ~ **into** разрастаться, превращаться в
growth [ɡrəʊθ] *n* рост
guidance ['ɡaɪdəns] *n* руководство, наведение; ~ **system** система наведения
guide [ɡaɪd] *n* руководитель; *v* вести, направлять

Н

half [hɑ:f] *n* половина
hall [hɔ:l] *n* зал
hammer ['hæmə] *n* молот; *v* вбивать, прибивать, стучать
hand [hænd] *n* рука; **on the one ~ ... on the other** ~ с одной стороны..., с другой стороны; *v* вручать
handle ['hændl] *v* обращаться с чем-либо, управлять, регулировать
handling ['hændlɪŋ] *n* обращение с чем-либо, транспортировка; ~ **device** транспортировочное средство, устройство; ~ **equipment** транспортировочное оборудова-

ние; ~ **unit** транспортировочное устройство

hang (hung) [hæŋ, hŋ] *v* вешать, подвешивать, висеть

happen ['hæpən] *v* происходить, случаться

happy ['hæpi] *a* счастливый

hard [hɑ:d] *a* твердый, трудный, тяжелый; *adv* упорно, трудно

hardly ['hɑ:dlɪ] *adv* едва, едва ли, с трудом

hardness ['hɑ:dnɪs] *n* твердость

hardships ['hɑ:dʃɪp] *n* (*pl*) трудности

hate [heit] *v* ненавидеть

head [hed] *n* голова, глава, руководитель; **at the ~ of** во главе; *v* возглавлять

headlight ['hedlaɪt] *n* фара

health [helθ] *n* здоровье

hear (heard) [hiə, hæ:d] *v* слышать

heart ['hɑ:t] *n* сердце, центр, ядро

heat [hi:t] *n* тепло, температура, нагрев; *v* нагревать; ~ **resisting** жаропрочный; ~ **treatment** термообработка

heating ['hi:tiŋ] *n* нагревание

heavy ['hevi] *a* тяжелый

heel [hi:l] *n* пята

height [hait] *n* высота, вершина

helium ['hi:ljəm] *n* гелий

help [help] *n* помощь; *v* помогать

hence [hens] *adv* следовательно, отсюда

hidden [hɪdn] *pp* скрытый

high [haɪ] *a* высокий; ~ **temperature alloy** жаропрочный сплав; ~ **quality steel** высокосортная (качественная) сталь

higher ['haɪə] *a* высший; ~ **education** высшее образование; ~ **school** высшее учебное заведение

highway ['haɪweɪ] *n* шоссе

historical [his'tɔ:ɪkəl] *a* исторический

history ['hɪstəri] *n* история

hold (held) [həʊld, held] *v* держаться, удерживать; ~ **a meeting** устраивать собрание; ~ **a post** занимать должность

hole [həʊl] *n* дыра, отверстие

hope [həʊp] *n* надежда; *v* надеяться; ~ **for the best** надеяться на лучшее

horizontal [hɔ:ri'zɒntl] *a* горизонтальный

horology [hɔ:'rɒlədʒɪ] *n* искусство измерения времени, часовое дело

hose [həʊz] *n* шланг

hostel ['hɒstəl] *n* общежитие

hot [hɒt] *a* горячий

house [haus] *n* дом; *v* вмещать, размещать; **to be ~ed** размещаться, помещаться

hover ['hɒvə] *v* парить, висеть, находиться в режиме парения

how [haʊ] *adv* как, каким образом; ~ **far** насколько (*о расстоянии*); ~ **long** сколько (*о времени*); ~ **many** сколько (*по количеству*); ~ **old** сколько лет (*о возрасте*)

however [haʊ'evə] *adv* однако; *conj* тем не менее

huge [hju:dʒ] *a* огромный

hull [hʌl] *n* корпус (*корабля*), каркас

human ['hju:mən] *a* человеческий; ~ **life** жизнь

humanity [hju:'mænɪtɪ] *n* человечество; **the humanities** гуманитарные науки

hydraulic [haɪ'drɔ:lik] *a* гидравлический

hydraulics [haɪ'drɔ:liks] *n* гидравлика

hydrogen ['haɪdrɪdʒən] *n* водород

hypersonic ['haɪpə:'səʊnɪk] *a* ультразвуковой, сверхзвуковой

I

idea [aɪ'diə] *n* мысль, представление

identical [aɪ'dentɪkəl] *a* одинаковый, идентичный

identify [aɪ'dentɪfaɪ] *v* устанавливать тождество, опознавать, отождествлять

i.e. = that is ['ðæt 'ɪz] *to* есть

ignite [ɪg'naɪt] *v* воспламенять

ignition [ɪg'niʃən] *n* воспламенение, зажигание

illuminate [ɪ'lju:mɪneɪt] *v* освещать, иллюминировать

image ['ɪmɪdʒ] *n* образ, изображение

imagination [ɪ,mædʒɪ'neɪʃən] *n* воображение, фантазия

imagine [ɪ'mædʒɪn] *v* представлять (себе), воображать

immediately [ɪ'mi:dʒətli] *adv* немедленно, сразу же, непосредственно

immensely [ɪ'mensli] *adv* чрезвычайно, очень, безмерно

impact ['ɪmpækt] *n* удар, воздействие, толчок; *a* ударный

impassable [ɪm'pɑ:səbl] *a* непроходимый, непроезжий

imperative [ɪm'perətɪv] *a* настоятельный, императивный, обязывающий

imperfect [ɪm'pə:fɪkt] *a* несовершенный

implement ['ɪmplɪment] *v* выполнять, осуществлять, обеспечивать выполнение

implementation [ɪmplɪmen'teɪʃən] *n* осуществление, выполнение

importance [ɪm'pɔ:təns] *n* значение, важность; **to be of ~** иметь значение

important [ɪm'pɔ:tənt] *a* важный, значительный

impose [ɪm'pəʊz] *v* налагать (*обязательство*)

impossible [ɪm'pɔsəbl] *a* невозможный

impress [ɪm'pres] *v* производить впечатление; поражать

impressible [ɪm'presəbl] *a* впечатляющий, впечатлительный, восприимчивый

impression [ɪm'preʃən] *n* впечатление

imprint [ɪm'prɪnt] *v* отпечатывать, оставлять след

improve [ɪm'pru:v] *v* улучшать, совершенствовать

improvement [ɪm'pru:vmənt] *n* улучшение, усовершенствование

impurity [ɪm'pjʊərɪti] *n* загрязнение, примесь

in [ɪn] *prp* в; ~ **a year** через год; ~ **any case** во всяком случае; ~ **detail** подробно; ~ **order to (that)** для того, чтобы; ~ **service** в эксплуатации; ~ **spite of** несмотря на; ~ **the meantime** между прочим, кстати; ~ **time** вовремя; ~ **what way** как, каким образом

inaccuracy [ɪn'ækjʊərəsi] *a* неточность

inattentive [ɪnə'tentɪv] *a* невнимательный

inch [ɪntʃ] *n* дюйм (2,54 см)

incline [In'klaɪn] *v* наклонять(ся), склонять(ся)

include [In'klu:d] *v* включать

incomplete [ɪnkəm'pli:t] *a* неполный, незавершенный

inconvenient [ɪnkən'vi:njənt] *a* неудобный

incorporate [In'kɔ:pəreɪt] *v* соединять(ся), объединять(ся), включать

incorrect [ɪnkə'rekt] *a* неправильный

increase [In'kri:s] *v* увеличивать(ся); [ɪnkri:s] *n* возрастание, рост, увеличение, прибавление

increasingly [In'kri:sɪŋli] *adv* все в большей степени

incredible [In'kredəbl] *a* невероятный, неправдоподобный

indeed [In'di:d] *adv* действительно, в самом деле

indefinite [In'defɪnɪt] *a* неопределенный, неограниченный

independence [ɪndɪ'pendəns] *n* независимость

independent [ɪndɪ'pendənt] *a* независимый

indestructible [ɪndɪs'trʌktəbl] *a* неразрушимый

indicate [ɪndɪkeɪt] *v* показывать, указывать

indicator [ɪndɪkeɪtə] *n* индикатор, указание, счетчик

indirect [ɪndɪ'rekt] *a* косвенный, не прямой

individual [ɪndɪ'vɪdʒuəl] *a* отдельный, индивидуальный

induction [ɪn'dʌkʃən] *n* всасывание, индукция; ~ **motor** индукционный мотор

industrial [ɪn'dʌstriəl] *a* промышленный, индустриальный; ~ **training** производственное обучение

industry ['ɪndəstri] *n* промышленность

ineffective [ɪnɪ'fektɪv] *a* неэффективный, безрезультатный

inertia [ɪ'nə:ʃjə] *n* инерция

inertness [ɪ'nə:tnɪs] *n* инертность

influence ['ɪnfluəns] *v* влиять, воздействовать; *n* влияние, воздействие

inform [ɪn'fɔ:m] *v* сообщать, информировать

information [ɪnfə'meɪʃən] *n* сообщение

inhabit [ɪn'hæbɪt] *v* жить, обитать, поселяться

initial [ɪ'niʃəl] *a* начальный, первоначальный

initiate [ɪ'niʃieɪt] *v* вводить, положить начало, приступить к чему-либо

inject [ɪn'dʒekt] *v* впрыскивать, вводить, впускать

inlet ['ɪnlet] *n* впуск, впускное отверстие; ~ **pipe** впускная труба; ~ **valve** впускной клапан

input ['ɪnpʊt] *n* ввод; ~ **section** устройство для ввода информации

inside [ɪn'saɪd] *n* внутренняя часть; *a* внутренний; *adv*, *prp* внутрь, внутри

insist [ɪn'sɪst] (**on**, **upon**) *v* настаивать на чем-либо

inspect [ɪn'spekt] *v* осматривать, проверять

install [ɪn'stɔ:l] *v* устанавливать, помещать, монтировать

installation [ɪnstə'leɪʃən] *n* установка, сборка

- instance** ['ɪnstəns] *n* пример; **for ~** например
- instant** ['ɪnstənt] *n* мгновение, момент
- instead** [ɪn'sted] *adv* вместо; ~ **of** вместо, взамен
- institute** ['ɪnstɪtju:t] *v* учреждать, основывать; *n* институт
- institution** [ɪnstɪ'tju:ʃən] *n* учреждение, общество
- instruct** [ɪn'strʌkt] *v* обучать, давать указания
- instruction** [ɪn'strʌkʃən] *n* обучение, инструкция, указание, распоряжение
- insulate** ['ɪnsuleɪt] *v* изолировать, отделять
- intake** ['ɪnteɪk] *n* впускное устройство, впуск, всасывание
- integrate** ['ɪntɪgreɪt] *v* соединять, интегрировать, объединять
- intelligence** [ɪn'telɪdʒəns] *n* ум, интеллект, разум
- intend** [ɪn'tend] *v* намереваться, предполагать (*сделать что-либо*); предназначить
- intensify** [ɪn'tensɪfaɪ] *v* усиливать(ся)
- intensity** [ɪn'tensɪti] *n* интенсивность, напряженность
- intensive** [ɪn'tensɪv] *a* интенсивный, напряженный
- intent** [ɪn'tent] *a* полный решимости, целеустремленный
- intention** [ɪn'tenʃən] *n* намерение
- interaction** [ɪntər'æksʃən] *n* взаимодействие
- interchangeable** [ɪntə:'tʃeɪndʒəbl] *a* взаимозаменяемый
- interconnect** [ɪntə:kə'nekt] *v* связывать(ся), взаимосвязывать
- interdisciplinary** [ɪntə'dɪsɪ'plɪnəri] *a* междисциплинарный
- interest** ['ɪntrɪst] *n* интерес; **to be of ~** представлять интерес; **to be ~ed in** интересоваться чем-либо, кем-либо; **to get ~ed** заинтересоваться
- interesting** ['ɪntrɪstɪŋ] *a* интересный
- interference** [ɪntə'fɪərəns] *n* вмешательство, препятствие, помеха, интерференция
- interior** [ɪn'tɪəriə] *n* внутренняя сторона; *a* внутренний
- internal** [ɪn'tə:nl] *a* внутренний; ~ **combustion engine** двигатель внутреннего сгорания (ДВС)
- interrelate** [ɪntərɪ'leɪt] *v* взаимосвязывать
- interrupt** [ɪntə'rʌpt] *v* прерывать
- interval** ['ɪntəvəl] *n* промежуток, перерыв, интервал
- interview** ['ɪntəvjʊ:] *n* беседа, интервью
- introduce** [ɪntrə'dju:s] *v* вводить, внедрять
- invade** [ɪn'veɪd] *v* вторгаться, захватывать, оккупировать
- invent** [ɪn'vent] *v* изобретать
- invention** [ɪn'venʃən] *n* изобретение
- investigate** [ɪn'vestɪgeɪt] *v* исследовать, расследовать
- investigation** [ɪn'vestɪ'geɪʃən] *n* исследование, расследование
- investment** [ɪn'vestmənt] *n* капиталовложение, помещение денег, вклад
- invisible** [ɪn'vɪzəbl] *a* невидимый
- invite** [ɪn'vaɪt] *v* приглашать
- involve** [ɪn'vɒlv] *v* вовлекать, включать в себя; ~**d (in)** связанный с

чем-либо, данный; **to be ~d in** быть связанным с чем-либо

iron ['aɪən] *n* железо; чугун (*амер.*); *a* железный

issue ['ɪʃu:] *v* выдавать

item ['aɪtəm] *n* пункт, параграф, отдельный предмет

J

jam [dʒæm] *n* затор, «пробка»; *v* заклинивать(ся), заедать

jet [dʒet] *n* струя, сопло; *a* реактивный; ~ **engine** реактивный двигатель; ~ **propelled** реактивный (*самолет*)

job [dʒɒb] *n* работа, дело, задание; операция; деталь

join [dʒɔɪn] *v* присоединяться (*к*), заниматься (*в*), поступать; ~ **together** соединять одно с другим

joint [dʒɔɪnt] *n* место соединения; стык; *a* общий, объединенный, совместный

journey ['dʒə:nɪ] *n* поездка, путешествие

junior ['dʒu:njə] *a* младший, юниорный

K

keep (kept) [ki:p, kept] *v* держать, сохранять; ~ **in mind** помнить, иметь в виду; ~ + *Gerund* продолжать (*делать*) что-то; ~ **on** продолжать(ся)

key [ki:] *n* ключ, *a* ключевой

kick [kɪk] *n* удар, толчок

kill [kɪl] *v* убивать

kilometer ['kɪləu,mɪ:tə] *n* километр

kind [kaɪnd] *n* вид, тип, разновидность, сорт, класс, характер; **all ~s of** всякие, самые разнообразные; **what ~ of** какой; **a ~ of** что-то вроде; **the ~ that** такой, который

kindergarten ['kɪndə,gɑ:tɪn] *n* детский сад

knock [nɒk] *v* ударять(ся), стучать; ~ **down** сломать, разрушать; сбить с ног

know (knew, known) [nəu, nju:, nəʊn] *v* знать; ~ **n** *a* известный

knowledge ['nɒlɪdʒ] *n* знания

L

label ['leɪbl] *n* ярлык, этикетка

laboratory = **lab** [lə'bɒrətəri] *n* лаборатория, *a* лабораторный; ~ **assistant** лаборант, препарат

labour ['leɪbə] *n* труд, работа

lack [læk] *v* испытывать недостаток; нуждаться; не иметь, не хватать, недоставать

lane [leɪn] *n* линия уличного движения; полоса дороги

land [lænd] *n* земля, страна; *a* наземный; *v* приземляться

language ['læŋgwɪdʒ] *n* язык

lantern ['læntən] *n* фонарь

large [lɑ:dʒ] *a* большой, крупный; **a ~ variety** самые разнообразные

largely ['lɑ:dʒli] *adv* в значительной степени, широко

laser ['leɪzə] *n* лазер

last [lɑ:st] *v* продолжаться; *a* прошлый, последний; ~ **month** (**year** и т.п.) в прошлом месяце (году и т.п.); ~ **time** в прошлый раз; **at ~** наконец

late [leɪt] *a* поздний; *adv* поздно; **to be ~** опаздывать; **in the ~ sixties** в конце 60-х годов; ~ **er on** позднее, потом, в дальнейшем

lately ['leɪtli] *adv* в последнее время, недавно

later ['leɪtə] *a* более поздний; *adv* позже; ~ **on** позднее, после, как-нибудь потом

latter (the latter) ['lætə] *a* последний (*из двух*)

latitude ['lætɪtju:d] *n* широта

laugh [lɑ:f] *v* смеяться, рассмеяться

launch [lɔ:ntʃ] *v* запускать; *n* запуск

law [lɔ:] *n* закон

lay (laid) [leɪ, leɪd] *v* класть, положить; ~ **the foundation** заложить основу, фундамент

lead [led] *n* свинец; *a* свинцовый

lead (led) [li:d, led] *v* вести, возглавлять, приводить к чему-либо

leader ['li:də] *n* руководитель

learn (learnt) [lə:n, læ:nt] *v* учить, научиться; узнавать что-либо, овладевать чем-либо

learning ['lə:nɪŋ] *n* учение, изучение

least [li:st] *n* наименьшее количество; **at** ~ по крайней мере (по меньшей мере)

leave (left) [li:v, left] *v* уходить, уезжать, оставлять

lecture ['lektʃə] *n* лекция; *v* читать лекцию

left [left] *a* левый

length [leŋθ] *n* длина; отрезок, кусок

lengthy ['leŋθɪ] *a* очень длинный, растянутый

lest [lest] *conj* чтобы ... не

let (let) [let] *v* давать, разрешать, позволять; ~'s **begin** начнем; ~'s **go** пойдёмте

letter ['letə] *n* буква, письмо

level ['levl] *n* уровень

lie (lay, lain) [laɪ, leɪ, leɪn] *v* лежать

lifeboat ['laɪfbəʊt] *n* спасательная шлюпка

lifetime ['laɪftaɪm] *n* продолжительность жизни, целая жизнь; срок службы

lift [lɪft] *n* поднятие, подъем; *v* поднимать

light [laɪt] *n* свет; (**lit, lighted**) [lɪt, 'laɪtɪd] *v* зажигать, зажигаться, освещать, светить; *a* светлый; легкий

lighten ['laɪtn] *v* облегчить, освещать

lighting ['laɪtɪŋ] *n* освещение

like [laɪk] *v* любить, нравиться; *a* подобный; **to be** ~ быть похожим; **look** ~ выглядеть как ...

likely ['laɪklɪ] *adv* вероятно, возможно

limit ['lɪmɪt] *v* ограничивать; *n* предел

limitation [ˌlɪmɪ'teɪʃən] *n* ограничение

line [laɪn] *n* линия, строчка, черта; **assembly** ~ сборочная линия

linear ['lɪniə] *a* линейный

link [lɪŋk] *v* связывать, соединять; *n* звено, связь

liquid ['lɪkwɪd] *a* жидкий; *n* жидкость

list [lɪst] *n* список, перечень

listen ['lɪsn] (**to**) слушать

lithium ['lɪθɪəm] *n* литий

little ['lɪtl] *adv* мало, немного; *a* небольшой, маленький; ~ **by** ~ понемногу, постепенно

livability ['lɪvəbɪlɪtɪ] *n* пригодность для жизни; условия, приемлемые (удобные) для жилья

live [lɪv] *v* жить

load [ləʊd] *v* нагружать; *n* груз; ~**ing** загрузка, погрузка

local ['ləukəl] *a* местный

locate [ləu'keɪt] *v* поместить, расположить, определить местоположение

location [ləu'keɪʃən] *n* локация, обнаружение, определение местонахождения, размещение

lock [lɒk] *v* запирать(ся); стопорить, блокировать

logistics [ləu'dʒɪstɪk] *n* материально-техническое обеспечение

long [lɒŋ] *a* длинный; *adv* долго; ~ **ago** давно; ~ **before** задолго до ...; ~ **distance communication** дальняя связь; **no ~er** больше не

longitude ['lɒndʒɪtju:d] *n* долгота

longitudinal [lɒndʒɪ'tju:dɪnəl] *a* продольный

longstanding ['lɒŋ'stændɪŋ] *a* давнишний

look [lʊk] *n* взгляд, выражение лица, вид; *v* смотреть, выглядеть ~ **at** смотреть; ~ **for** искать; ~ **upon** смотреть как на..., рассматривать как...; ~ **up** искать в словаре; ~ **here!** послушайте! ~ **like** быть похожим

lorry ['lɒrɪ] *n* грузовой автомобиль, грузовик

lose (lost) [lu:z, lɒst] *v* терять, лишаться

loss [lɒs] *n* потеря

lot [lɒt] *a lot of* = **very much** очень много

love [lʌv] *v* любить

low [ləu] *a* низкий; ~**er** нижний

lower ['ləuə] *v* спускать (*шлюпку, парус, флаг*); снижать

lubrication [lu:brɪ'keɪʃən] *n* смазка

luck [lʌk] *n* везение, удача

lunar ['lu:nə] *a* лунный; ~ **motion** движение Луны

luxury ['lʌkʃəri] *n* роскошь; большое удовольствие

М

machine [mə'ʃi:n] *v* обрабатывать, подвергать механической обработке; *n* машина, станок; ~ **building** машиностроение; ~ **tool** станок

madman ['mædmən] *n* сумасшедший, безумец

magazine [mægə'zi:n] *n* журнал

magnetic [mæg'netɪk] *a* магнитный

magnificent [mæg'nɪfɪsnt] *a* великолепный, величественный

mail [meɪl] *n* почта, почтовая корреспонденция, почтовое отправление

main [meɪn] *a* основной, главный; **the ~ thing** самое главное

mainly ['meɪnli] *adv* главным образом

maintain [meɪn'teɪn] *v* поддерживать; обслуживать, содержать в исправности

maintenance ['meɪntənəns] *n* сохранение в исправности, техническое обслуживание; эксплуатация

major ['meɪdʒə] *a* главный, основной

majority [mə'dʒɔ:ɪtɪ] *n* большинство

make (made) [meɪk, meɪd] *v* делать, производить, изготавливать, заставлять; ~ **difficult** затруднять; ~ **every effort** приложить все усилия; ~ **friends** подружиться; ~ **sure** убедиться; ~ **up one's mind** принять решение; ~ **use of** использовать; ~ **up** составлять, собирать, комплектовать

management ['mænidʒmənt] <i>n</i> управление, заведование, правление, дирекция, администрация	means [mi:ns] <i>n</i> средство, способ, устройство; by ~ of посредством, при помощи; by no ~ ни под каким предлогом, ни за что; by all ~ любым способом, обязательно
maneuver [mə'nu:və] <i>v</i> маневрировать	meanwhile ['mi:n'waɪl] <i>adv</i> тем временем; между тем
mankind [mæn'kaɪnd] <i>n</i> человечество	measure ['meɪʒə] <i>n</i> мера; to take ~s принимать меры; <i>v</i> измерять
manned [mænd] <i>pp</i> (от man) пилотируемый (человеком), с людьми на борту, обитаемый	measuring ['meɪʒərɪŋ] <i>a</i> измерительный; ~ devices измерительные приборы
manner ['mænə] <i>n</i> способ, образ действия, манера; in a ~ different from не так, как ..., иным способом, по-другому	measurement ['meɪʒəmənt] <i>n</i> измерение
manufacture [ˌmænjʊ'fæktʃə] <i>v</i> производить, обрабатывать, изготавливать; <i>n</i> производство, изготовление, обработка	medicine ['medsɪn] <i>n</i> медицина
manufacturer [ˌmænjʊ'fæktʃərə] <i>n</i> изготовитель, производитель	medium ['mi:dʒəm] <i>n</i> среда (вещество)
marine [mə'ri:n] <i>a</i> морской, судовой	meet (met) [mi:t, met] <i>v</i> встречаться, знакомиться; ~ the requirements (demands, needs) удовлетворять требованиям
mark [mɑ:k] <i>n</i> отметка; <i>v</i> отмечать	meeting ['mi:tɪŋ] <i>n</i> собрание; to hold a ~ устраивать собрание
marking ['mɑ:kɪŋ] <i>n</i> разметка, отметка, маркировка	melt [melt] <i>n</i> расплавленный металл, расплав; <i>v</i> плавить(ся)
mass [mæs] <i>n</i> масса; <i>a</i> массовый; ~ production массовое производство	member ['membə] <i>n</i> член, часть, деталь, элемент конструкции
master ['mɑ:stə] <i>v</i> овладевать	memorial [mi'mɔ:riəl] <i>n</i> памятник, мемориал
match [mætʃ] <i>v</i> соответствовать, подходить	memory ['meməri] <i>n</i> память, запоминающее устройство ЭВМ
material [mə'tiəriəl] <i>n</i> материал; <i>a</i> существенный, значительный	mention ['menʃən] <i>v</i> упоминать; <i>n</i> упоминание; ~ should be made следует упомянуть
mathematics [ˌmæθɪ'mætɪks] <i>n</i> математика	mercury ['mɜ:kjʊri] <i>n</i> ртуть
matter ['mætə] <i>n</i> вещество, дело, вопрос	metallurgist [me'tælədʒɪst] <i>n</i> металлург
meal [mi:l] <i>n</i> принятие пищи, еда	metallurgy [me'tælədʒɪ] <i>n</i> металлургия
mean (meant) [mi:n, ment] <i>v</i> означать; <i>a</i> средний	meter ['mi:tə] <i>n</i> метр, измеритель, датчик
meaning ['mi:nɪŋ] <i>n</i> значение, смысл	method ['meθəd] <i>n</i> метод, способ

microchip ['maɪkrəʊtʃɪp] *n* микросхема, микрокристалл

middle ['mɪdl] *a* средний; *n* середина

mile [maɪl] *n* миля

military ['mɪlɪtəri] *a* военный

mind [maɪnd] *n* память, мнение, мысль; **to keep in** ~ помнить, иметь в виду; **never** ~ ничего, не обращайтесь внимания, не беда

minute ['mɪnɪt] *n* минута

minute [maɪ'nju:t] *a* мелкий, крохотный, мельчайший

missile ['mɪsaɪl] *n* ракета, снаряд

mission ['mɪʃən] *n* миссия, цель, задача; полет

mistake [mɪs'teɪk] *n* ошибка; **to be** ~ *n* ошибаться

mixture ['mɪkstʃə] *n* смесь

mobile ['məʊbaɪl] *a* подвижный, мобильный, передвижной

mobility [məʊ'bɪlɪtɪ] *n* подвижность, мобильность

modest ['mɒdɪst] *a* скромный, умеренный

modular ['mɒdjulə] *a* модульный

modul(e) ['mɒdju:l] *n* модуль, блок; модульный отсек; ~ **drive** привод модуля

money ['mʌni] *n* деньги

monitor ['mɒnɪtə] *n* староста; контрольное устройство, контрольно-измерительное устройство, монитор; *v* осуществлять текущий контроль, контролировать

monitoring ['mɒnɪtərɪŋ] *n* контроль

moor [muə] *v* причаливать, пришвартовываться

more or less [mɔ:(r)ə'les] *adv* более или менее; **more than** более чем

moreover [mɔ:'rəʊvə] *adv* кроме того, более того

most [məʊst] *n* большая часть, наибольшее количество; ~ **of** большинство, большая часть; ~ **widely used** самый распространенный; *adv* наиболее, более всего

mostly ['məʊstli] *adv* главным образом, большей частью

motion ['məʊʃən] *n* движение

motor ['məʊtə] *n* мотор, двигатель, автомобиль; ~ **car** автомобиль (легковой)

motorway ['məʊtəweɪ] *n* автострада, автомагистраль

mount [maʊnt] *v* устанавливать, монтировать

mounting ['maʊntɪŋ] *n* монтаж, сборка, установка

move [mu:v] *v* двигаться, передвигаться, переезжать; ~ **down** опускаться; **to be on the** ~ находиться в движении

movement ['mu:vmənt] *n* движение

much [mʌʃ] *a* много; ~ **more** гораздо больше

multitude ['mʌltɪtju:d] *n* множество, большое число

mural ['mjuərəl] *n* фресковая живопись, фреска

mysterious [mɪs'tɪəriəs] *a* таинственный, непостижимый

N

nail [neɪl] *n* гвоздь

name [neɪm] *n* имя; *v* называть; ~ **after** называть в честь кого-то

namely ['neɪmli] *adv* а именно, то есть

natural ['nætʃrəl] *a* естественный

nature ['neɪtʃə] *n* природа, тип, вид

navigation [ˌnævɪˈgeɪʃən] *n* мореходство, судоходство, навигация

navy ['neɪvɪ] *n* военно-морской флот

near [niə] *adv* около, близко

nearly ['niəli] *adv* почти

necessary ['nesɪsəri] *a* необходимый

necessity [nɪˈsesɪti] *n* необходимость

need [ni:d] *n* необходимость, *v* нуждаться

needle ['ni:dl] *n* игла, стрелка

negative ['negətɪv] *a* отрицательный

network ['netwɜ:k] *n* сеть, сетка

never ['nevə] *adv* никогда; ~ **mind** ничего, не обращайтесь внимания

new [nju:] *a* новый; ~ **man** новичок

news [nju:z] *n* новость, новости

newspaper ['nju:s,peɪpə] *n* газета

next [nekst] *a* следующий; ~ **year** в следующем году

nickel ['nɪkl] *n* монета в 5 центов

night [naɪt] *n* ночь

non-traditional ['nɒntreˈdɪʃənəl] *a* нетрадиционный

nose [nəʊz] *n* нос, носовая передняя часть (лодки, самолета, машины)

notable ['nəʊtəbl] *a* заметный, значительный, достопримечательный

notation [nəʊˈteɪʃən] *n* **binary** ~ двоичная система изображения чисел

note [nəʊt] *v* делать заметки, записывать, отмечать, обращать внимание, замечать

notebook ['nəʊtbuk] *n* записная книжка, тетрадь

nothing ['nʌθɪŋ] ничего; ~ **to be done** ничего нельзя сделать

notice ['nəʊtɪs] *v* замечать

not only... but also ['nɒt ənlɪ bət'ɔ:lseu] не только ..., но и

novelty ['nɒvəltɪ] *n* новизна, новость, новинка, нововведение, новшество

now [naʊ] *adv* теперь, сейчас

nowadays ['naʊədeɪz] *adv* в настоящее время, теперь

nowhere ['nəʊwɛə] *adv* нигде

nuclear ['nju:klɪə] *a* ядерный; ~ **engineering** ядерная техника; ~ **power** ядерная энергия

nucleus ['nju:klɪəs] *n* (*pl* **nuclei**) ядро, центр, атомное ядро

number ['nʌmbə] *n* номер, число; **a** ~ **of** ряд, несколько; **in a** ~ **of ways** несколькими способами; *v* насчитывать

numerical [nju:'merɪkəl] *a* числовой

numerous ['nju:mərəs] *a* многочисленный

О

obey [ə'beɪ] *v* повиноваться

object ['ɒbʤɪkt] *n* предмет, дополнение; [əb'ʤekt] *v* возражать, протестовать

observation [ˌɒbzə:'veɪʃən] *n* наблюдение

observatory [əb'zə:vətɪrɪ] *n* обсерватория

observe [əb'zə:v] *v* наблюдать

obtain [əb'teɪn] *v* получать, приобретать

obvious ['ɒvviəs] *a* очевидный, явный, ясный

occasion [ə'keɪzən] *n* случай; **on the ~** по случаю

occupy ['ɒkjupaɪ] *v* занимать; **to be occupied** быть занятым

occur [ə'kʌ:] *v* происходить, случаться, иметь место

ocean ['əʊʃən] *n* океан

offer ['ɒfə] *v* предлагать, выражать готовность

office ['ɒfɪs] *n* контора, кабинет; **post ~** почта, почтовое отделение

official [ə'fɪʃəl] *n* чиновник, *a* официальный

often ['ɒfn] *adv* часто

oil ['ɔɪl] *n* масло, смазка; *v* смазывать

old [əʊld] *a* старый; **how ~** сколько лет

on [ɒn] *prp* на, при, по; **~ the occasion** по случаю; **~ the other hand** с другой стороны; **~ the part of** со стороны; **~ the way** по дороге, по пути; **onward** вперед, дальше

once [wʌns] *adv* однажды, один раз; **~ again**, **~ more** еще раз; **at ~** сразу; **~ a week** раз в неделю

one [wʌn] **~ another** друг друга; **~ by ~** по одному, постепенно; **~ day** однажды; **~ more** еще один; **~ thing** одно

only ['əʊnli] *a* единственный; **the ~ way** единственный способ; **not ~ ... but also** не только ..., но и

open ['əʊpən] *a* открытый, *v* открывать(ся)

operate ['ɒpəreɪt] *v* действовать, работать, приводить в действие

operation [ˌɒpə'reɪʃən] *n* работа, операция, действие

operator ['ɒpəreɪtə] *n* рабочий, оператор

opinion [ə'pɪnjən] *n* мнение

opportunity [ˌɒpə'tju:nɪti] *n* возможность

oppose [ə'pəʊz] *v* противодействовать, возражать

opposite ['ɒpəzɪt] *a* противоположный

opposition [ˌɒpə'zɪʃən] *n* противодействие, оппозиция, сопротивление

oppress [ə'pres] *v* угнетать

oppressive [ə'presɪv] *a* гнетущий, угнетающий, тягостный

optical ['ɒptɪkəl] *a* оптический; **~ fiber** оптическое волокно

optics ['ɒptɪks] *n* оптика

oral ['ɔ:rəl] *a* устный

orange ['ɒrɪndʒ] *a* оранжевый

orbit ['ɔ:bit] *n* орбита

order ['ɔ:də] **in ~ to**, **in ~ that** для того, чтобы

ordinary ['ɔ:dnrɪ] *a* обычный

organization [ˌɔ:gənəɪ'zeɪʃən] *n* организация

organize ['ɔ:gənaɪz] *v* организовывать

origin ['ɒrɪdʒɪn] *n* возникновение, происхождение, начало

original [ə'rɪdʒənəl] *a* самостоятельный, первоначальный

other ['ʌðə] *a* другой; **others** *n* другие, остальные

otherwise ['ʌðəwaɪz] *adv* иными словами, иначе, в противном случае

ought [ɔ:t] *v* модальный глагол, выражающий долженствование

outer ['aʊtə] *a* внешний, наружный; **~ space** космическое пространство, космос

outline ['aʊtlaɪn] *n* очертание; *v* обрисовывать(ся), очерчивать, описывать

output ['aʊtput] *n* производительность, выход (*продукции*)

outside ['aʊt'saɪd] *a* внешний, наружный; *adv* снаружи

outstanding [aʊt'stændɪŋ] *a* выдающийся, знаменитый

over ['əʊvə] *prp* по, над, выше; **to be** ~ оканчиваться

overall ['əʊvəɹɔ:l] *a* полный, общий, предельный, всеобщий; *n* спецодежда, комбинезон

overcome (**overcame**) [əʊvə'kʌm, əʊvə'keɪm] *v* преодолевать

overestimate ['əʊvər'estimeɪt] *v* переоценивать

overload ['əʊvə'ləʊd] *v* перегружать

owing to ['əʊɪŋtə] *prp* благодаря, вследствие

own [əʊn] *a* собственный; *v* владеть, иметь

Р

pack [pæk] *n* пакет, пачка, связка, кипа, вьюк

package ['pækɪdʒ] *n* пакет, модуль, программный пакет

paint [peɪnt] *v* писать красками, красить, окрашивать

painter ['peɪntə] *n* художник, живописец

palace ['pælɪs] *n* дворец

panel ['pænl] *n* панель; щит управления, приборная панель

paper ['peɪpə] *n* бумага, статья; *a* бумажный

parents ['pɛərənts] *n* родители

park [pɑ:k] *v* поставить на длительную стоянку (*автомашину*)

parking ['pɑ:kɪŋ] *n* стоянка, стоянка автотранспорта

part [pɑ:t] *n* часть, деталь; **to take** ~ принимать участие

partial ['pɑ:ʃəl] *a* частичный

partially ['pɑ:ʃəlɪ] *adv* частично

particle ['pɑ:tɪkl] *n* частица

particular [pə'tɪkjulə] *a* особенный, данный, определенный; **in** ~ в особенности, в частности

particularly [pə'tɪkjuəlɪ] *adv* особенно, в особенности

pass [pɑ:s] *v* проходить; ~ **examinations** сдавать экзамены

passage ['pæsɪdʒ] *n* абзац, проход

passenger ['pæsɪndʒə] *n* пассажир; ~ **car** легковой автомобиль

passive ['pæsɪv] *a* пассивный

past [pɑ:st] *a* прошлый, прошедший; *adv* через, сквозь, мимо

path [pɑ:θ] *n* путь, дорога, направление

pathway ['pɑ:θweɪ] *n* траектория; рабочий мостик (*для сообщений*)

pattern ['pætən] *n* модель, образец

pave [peɪv] *v* ~ **the way** прокладывать путь, подготавливать почву (*для проведения чего-либо*)

pay (**paid**) [peɪ, peɪd] *v* платить; ~ **attention** обращать внимание; *n* плата, выплата, заработная плата

payload ['peɪləʊd] *n* полезная нагрузка

peace [pi:s] *n* мир

pearl [pɜ:l] *n* жемчуг

peculiar [pɪ'kju:lɪə] *a* особый

peculiarity [pɪ'kju:lɪ'ærɪtɪ] *n* особенность, отличительная черта

pedagogical [ˌpedə'ɡɒdʒɪkəl] *a* педагогический

penetrate ['penɪtreɪt] *v* проникать

people ['pi:pl] *n* люди, народ

per [pə:] *prep* за, в, на; ~ **hour (mile)** в час, на милю и т. п.

per cent [pə'sent] *n* процент

perfect ['pə:fɪkt] *a* прекрасный, совершенный

perfect [pə'fekt] *v* усовершенствовать, улучшать

perform [pə'fɔ:m] *v* выполнять

performance [pə'fɔ:məns] *n* характеристика (работы машины); поведение

perhaps [pə'hæps] *adv* может быть

period ['piəriəd] *n* срок, период, время

periodical [ˌpiəri'ɒdɪkəl] *a* периодический (закон)

periodicity [ˌpiəriə'disɪtɪ] *n* периодичность

permanent ['pə:mənənt] *a* постоянный

permission [pə'mɪʃən] *n* разрешение

permit [pə'mɪt] *v* разрешать

persist [pə'sɪst] *v* настаивать, продолжать

person ['pə:sn] *n* человек

personal ['pə:snl] *a* личный

petrol ['petrəl] *n* бензин

phase [feɪz] *n* фаза, стадия, степень

phenomenon [fɪ'nɒmɪnən] *n* (*pl* **phenomena**) явление

philosophy [fɪ'lɒsəfɪ] *n* философия

Ph.D. ['pi:etʃ'di:] доктор философии (ученое звание)

photo ['fəutəu] *n* фотография

photographic [ˌfəutə'græfɪk] *a* фотографический

physical ['fɪzɪkəl] *a* физический

physicist ['fɪzɪsɪst] *n* физик

physics ['fɪzɪks] *n* физика

pick up [pɪk'ʌp] *v* собирать, подбирать

picture ['pɪktʃə] *n* картина, изображение

piece [pi:s] *n* деталь, узел, кусок, устройство

pillow ['pɪləu] *n* подушка

pilot ['paɪlət] *v* пилотировать; *n* пилот

pipe [paɪp] *n* труба, трубка

piston ['pɪstən] *n* поршень

place [pleɪs] *v* помещать

plan [plæn] *v* планировать, предполагать

planning ['plænɪŋ] *n* планирование, проектирование

plane [pleɪn] *n* плоскость, *a* плоский

plane [pleɪn] = **aeroplane** ['æərəpleɪn] *n* самолет

planet ['plænɪt] *n* планета

planetary ['plænitəri] *a* планетный, планетарный

plant [plɑ:nt] *n* растение; завод, фабрика; установка, агрегат

plate [pleɪt] *n* пластинка, плитка

platform ['plætfo:m] *n* платформа

play [pleɪ] *v* играть; ~ **role** играть роль

please [pli:z] пожалуйста; **to be ~d** быть довольным

pleasure ['plezə] *n* удовольствие

plug [plʌg] *v* ~ **in** закупоривать, затыкать; *n* пробка, стопор; **spark** ~ свеча зажигания

p.m. (post meridiem) *adv* после полудня, пополудни

pocket ['pɒkɪt] *n* карман

point [pɔɪnt] *n* конец, острие, точка, вопрос; *v* ~ **out** указывать

pole [pəʊl] *n* полюс

policy ['pɒlɪsɪ] *n* политика
polite [pə'laɪt] *a* вежливый
pollute [pə'lu:t] *v* загрязнять
pollution [pə'lu:ʃən] *n* загрязнение
polygon ['pɒlɪɡən] *n* многоугольник
popular ['pɒpjulə] *a* популярный, общественный
population [ˌpɒpjʊ'leɪʃən] *n* жители, население
portable ['pɔ:təbl] *a* портативный, переносной, передвижной; съемный
position [pə'zɪʃən] *n* место, пост, должность, позиция
possess [pə'zes] *v* обладать
possibility [ˌpɒsə'bɪlɪtɪ] *n* возможность
possible ['pɒsəbl] *a* возможный; **as much as** ~ как можно больше
post [pəʊst] *n* почта; свая, подпорка
postmaster ['pəʊst,mɑ:stə] *n* начальник почты
postoffice ['pəʊst,ɒfɪs] *n* почтовое отделение, почта
pound [paʊnd] *n* фунт (453 г)
power ['paʊə] *n* мощность, энергия, способность, власть; ~ **generation** производство энергии; ~ **engineer** инженер-энергетик; ~ **engineering** энергомашиностроение; ~ **plant** электростанция, силовая установка; ~ **station** электростанция; ~ **source** источник энергии; *a* силовой, энергетический
powerful ['paʊəfʊl] *a* мощный, сильный
practical ['præktɪkəl] *a* практический; ~ **training** практика, практические занятия

practically ['præktɪkəlɪ] *adv* практически
practice ['præktɪs] *n* практика
pre-arranged ['pri:ə'reɪndʒd] *a* предусмотренный, заранее составленный
precede [pri:'si:d] *v* предшествовать
precision [prɪ'sɪʒən] *n* точность
predetermined ['pri:dɪ'tə:mɪnd] *a* заранее установленный, предопределенный
predict [prɪ'dɪkt] *v* предсказывать, прогнозировать
prediction [prɪ'dɪkʃən] *n* предположение, предсказание
prefer [prɪ'fə:] *v* предпочитать
preliminary [prɪ'lɪmɪnəri] *a* предварительный
premium ['pri:mjəm] *n* премия, награда
preparation [ˌprepə'reɪʃən] *n* подготовка
prepare [prɪ'pɛə] *v* подготавливать, готовить
preparatory [prɪ'pærətəri] *a* подготовительный, предварительный
presence ['prezns] *n* присутствие, наличие
present [prɪ'zent] *v* представлять (*статью, доклад*)
present ['preznt] *a* присутствующий; **to be** ~ присутствовать; ~ **day** *a* современный, настоящий; **at** ~ в настоящее время
preset [ˌpri:'set] *a* заранее установленный, заданный, программированный
pressure ['preʃə] *n* давление; ~ **measuring device** манометр
prevent [prɪ'vent] *v* мешать, предотвращать

previous ['pri:vjəs] *a* предшествующий

previously ['pri:vjəsli] *adv* предварительно

price [praɪs] *n* цена

prime mover ['praɪm 'mu:və] *n* первичный двигатель

primitive ['prɪmɪtɪv] *a* простой, примитивный

principal ['prɪnsəpəl] *a* главный

principle ['prɪnsəpl] *n* принцип

print [prɪnt] *n* гравюра, эстамп

priority [praɪ'ɔrɪti] *n* приоритет, порядок срочности (очередности)

private ['praɪvɪt] *a* частный, личный

privately ['praɪvɪtli] *adv* частным образом

prize [praɪz] *n* премия, награда

probe [prəʊb] *n* проба, зонд; автоматическая исследовательская ракета (станция)

problem ['prəʊbləm] *n* задача; проблема

proceed [prə'si:d] *v* продолжать, продвигаться вперед; ~ **to a degree** получать ученую степень

process [prə'ses] *v* обрабатывать; ['prəuses] *n* процесс

processing [prə'sesiŋ] *n* обработка

produce [prə'dju:s] *v* производить, создавать

producer [prə'dju:sə] *n* производитель, изготовитель

product ['prɒdʌkt] *n* продукт, изделие, продукция

production [prə'dʌkʃən] *n* производство

productivity [prɒdʌk'tɪvɪti] *n* производительность

program(me) ['prəʊgræm] *n* программа, составлять программу; программировать

programmable ['prəʊgræməbl] *a* программируемый, с программным управлением

progress ['prəʊgrəs] *n* прогресс, успех, развитие

project ['prɒdʒekt] *n* проект; [prə'dʒekt] *v* проектировать, обдумывать план

projectile ['prɒdʒɪktail] *n* реактивный снаряд

prolonged [prəu'lonɪd] *pp* продленный; затянувшийся, длительный

prominent ['prɒmɪnənt] *a* выдающийся

promise ['prɒmɪs] *v* обещать; *n* обещание

promising ['prɒmɪsɪŋ] многообещающий, подающий надежды

promptly ['prɒmptli] *adv* сразу, быстро, точно

proof [pru:f] *n* доказательство

propagation [prɒpə'geɪʃən] *n* распространение (движения), продвижение

propel [prə'pel] *v* приводить в движение, продвигать вперед, толкать

propellant [prə'pelənt] *n* топливо, горючая смесь, горючее

proper ['prɒpə] *a* правильный, надлежащий

properly ['prɒpəli] *adv* надлежащим образом

property ['prɒpəti] *n* свойство

proportion [prə'pɔ:ʃən] *n* пропорция, соотношение; *in* ~ пропорционально

propose [prə'pəʊz] *v* предлагать, вносить предложение

propulsion [prə'pʌlʃən] *n* движение вперед, толчок

prospects ['prɒspekts] *n* возможности, перспективы

prospective [prəs'pektɪv] *a* предполагаемый, ожидаемый, относящийся к будущему, будущий

protect [prə'tekt] *v* защищать

protection [prə'tekʃən] *n* защита

proton ['prəʊtɒn] *n* протон

prove [pru:v] *v* доказывать, оказываться

provide [prə'vaɪd] *v* снабжать

provided [prə'vaɪdɪd] *conj* в том случае, если

public ['pʌblɪk] *a* общественный, народный

publication [ˌpʌblɪ'keɪʃən] *n* опубликование, издание

publish ['pʌblɪʃ] *v* издавать, опубликовывать

pulley ['pʊli] *n* шкив, блок

pump [pʌmp] *n* насос, помпа; *v* накачивать

punch [pʌntʃ] *v* пробивать отверстие, штамповать; *n* пробойник, пуансон

punching ['pʌntʃɪŋ] *n* перфорирование, пробивание (*отверстий*); штамповка

pupil ['pju:pl] *n* ученик, учащийся

pure [pjʊə] *a* чистый

purity ['pjʊəriti] *n* чистота, беспримесность

purpose ['pə:pəs] *n* цель, назначение

push [puʃ] *v* толкать; ~ **out** выталкивать

put (put) [put] *v* класть; ~ **down** записать; ~ **into effect** осуществлять; ~ **into service** пустить в эксплуатацию

Q

qualification [ˌkwɒlɪfɪ'keɪʃən] *n* квалификация

qualified ['kwɒlɪfaɪd] *a* квалифицированный

quality ['kwɒlɪti] *n* качество

quantitative ['kwɒntɪtətɪv] *a* количественный

quantity ['kwɒntɪti] *n* количество

question ['kwestʃən] *n* вопрос; **in** ~ рассматриваемый (данный) вопрос

questionable ['kwestʃənəbl] *a* сомнительный, подозрительный

quick [kwɪk] *a* быстрый

quiet ['kwaɪət] *a* спокойный, тихий

quite [kwaɪt] *adv* вполне; ~ **a number** довольно много

R

race [reɪs] *n* состязание, гонка

radar ['reɪdə] *n* радар

radiate ['reɪdɪeɪt] *v* излучать, расходиться из центра

radiation [ˌreɪdɪ'eɪʃən] *n* радиация

radically ['rædɪkəli] *adv* коренным образом

radio ['reɪdɪəʊ] *n* радио; ~ **engineering** радиотехника; ~ **receiver** = ~ **set** радиоприемник

random ['rændəm] *a* случайный; беспорядочный

range [reɪndʒ] *n* радиус действия, расстояние, ряд, диапазон; *v* простираться, колебаться в известных пределах; **close** ~ на близком расстоянии

rapid ['ræpɪd] *a* быстрый

rate [reɪt] *n* темп; скорость; **twice the** ~ в два раза быстрее; **at any** ~ во всяком случае

rather ['rɑ:ðə] *adv* весьма, довольно, очень; ~ **than** а не ...

ratio ['reiʃiəu] *n* отношение, соотношение

ray [reɪ] *n* луч; **cathode- ~ tube** электронно-лучевая трубка

reach [ri:tʃ] *v* достигать

read (read) [ri:d, red] *v* читать

readily ['rediɪ] *adv* охотно

reading ['ri:diŋ] *n* чтение; ~ **room** читальня

ready ['redi] *a* готовый; **to be ~** быть готовым; **to get ~** готовиться к чему-либо

real [riəl] *a* действительный, настоящий

reality [ri:'æliɪti] *n* действительность, реальность

realize ['ri:əlaɪz] *v* понимать, отчетливо представлять, осуществлять

really ['ri:əli] *adv* действительно, в самом деле

rear [riə] *a* задний

rearward ['riəwəd] *adv* назад, в обратном направлении

reason ['ri:zn] *n* причина

reasonable ['ri:znəbl] *a* разумный, приемлемый

receive [ri'si:v] *v* получать

receiver [ri'si:və] *n* приемник

recent ['ri:snt] *a* последний, недавний

recently ['ri:sntli] *adv* недавно

recognition [,rekəg'niʃən] *n* признание

recognize ['rekəgnaɪz] *v* признавать

recollect [,rekə'lekt] *v* вспоминать

recommendation [,rekəmen'deɪʃən] *n* рекомендация

reconstruct ['ri:kəns'trʌkt] *v* реконструировать, переделывать, восстанавливать

record [rɪ'kɔ:d] *v* записывать, регистрировать; ['rekɔ:d] *n* запись

recreation [,rekri'eɪʃən] *n* восстановление сил, отдых

recycle [ri:'saɪkl] *v* повторить цикл; возвратить в исходное состояние; перерабатывать

reduce [rɪ'dju:s] *v* уменьшать, снижать

reduction [rɪ'dʌkʃən] *n* снижение, уменьшение

re-entry [ri:'entri] *n* вход, возвращение в плотные слои атмосферы

refer [rɪ'fə:] *v* ссылаться, упоминать

reference book ['refrəns buk] *n* справочник

reflect [rɪ'flekt] *v* отражать(ся), размышлять

reflection [rɪ'flekʃən] *n* отражение

refuse [rɪ'fju:z] *v* отказывать(ся)

regard [rɪ'gɑ:d] *v* рассматривать, считать, полагать

regulate ['regjuleɪt] *v* регулировать, упорядочивать

relate [rɪ'leɪt] *v* рассказывать, связывать, относить к чему-либо

relation [rɪ'leɪʃən] *n* отношение, соотношение, взаимосвязь, родство

relative ['relətiv] *a* относительный

relatively ['relətivli] *adv* сравнительно, относительно

relativity [,relə'tiviti] *n* относительность, теория относительности

relax [rɪ'læks] *v* расслабляться, снижать напряжение

reliability [rɪˌlaɪəˈbɪlɪti] <i>n</i> надежность	вести исследовательскую работу ; <i>a</i> научно-исследовательский
reliable [rɪˌlaɪəbl̩] <i>a</i> надежный, прочный	resemble [rɪˈzembəl] <i>v</i> походить, иметь сходство
rely [rɪˈlaɪ] (on, upon) <i>v</i> полагаться (<i>на</i>)	resist [rɪˈzɪst] <i>v</i> сопротивляться; оказывать сопротивление
remain [rɪˈmeɪn] <i>v</i> оставаться	resistance [rɪˈzɪstəns] <i>n</i> сопротивление
remains [rɪˈmeɪnz] <i>n</i> остатки	resistant [rɪˈzɪstənt] <i>a</i> heat ~ теплостойкий
remarkable [rɪˈmɑːkəbl̩] <i>a</i> замечательный, выдающийся	resistivity [ˌrɪzɪsˈtɪvɪti] <i>n</i> удельное сопротивление
remember [rɪˈmembə] <i>v</i> помнить	resolve [rɪˈzɒlv] <i>v</i> решать(ся), принимать решение
remote [rɪˈməʊt] <i>a</i> отдаленный, дистанционный, действующий на расстоянии; ~ controlled с дистанционным управлением	resource [rɪˈsɔːs] <i>n</i> источник, ресурс
remove [rɪˈmuːv] <i>v</i> удалять, снимать	respect [rɪsˈpekt] <i>n</i> отношение; in all ~s во всех отношениях; in this ~ в этом отношении; in many ~ во многих отношениях; with ~ to что касается
renewal [rɪˈnjuːəl] <i>n</i> возрождение, обновление	responsible [rɪsˈpɒnsəbl̩] <i>a</i> ответственный; to be ~ for отвечать за что-либо
repair [rɪˈpɛə] <i>v</i> обновлять, восстанавливать, ремонтировать	rest [rest] <i>n</i> покой, отдых; the ~ остальное, остаток
repeat [rɪˈpiːt] <i>v</i> повторять	restore [rɪsˈtɔː] <i>v</i> восстанавливать(ся)
replace [rɪˈpleɪs] <i>v</i> заменять, вытеснять	result [rɪˈzʌlt] <i>n</i> результат; <i>v</i> ~ in приводить к чему-либо; ~ from быть результатом чего-либо
replenish [rɪˈplenɪʃ] <i>v</i> снова наполнять, пополнять	retain [rɪˈteɪn] <i>v</i> удерживать, сохранять, поддерживать
reply [rɪˈplaɪ] <i>n</i> ответ; <i>v</i> отвечать	retire [rɪˈtaɪə] <i>v</i> уходить в отставку (<i>на пенсию</i>)
report [rɪˈpɔːt] <i>v</i> докладывать; <i>n</i> доклад	retrieve [rɪˈtriːv] <i>v</i> отыскивать (<i>информацию</i>)
represent [ˌreprɪˈzent] <i>v</i> представлять, изображать	return [rɪˈtəːn] <i>v</i> возвращаться; <i>n</i> возвращение; <i>a</i> обратный
representative [ˌreprɪˈzentətɪv] <i>n</i> представитель; <i>a</i> характерный, показательный	reveal [rɪˈviːl] <i>v</i> показывать, обнаруживать
require [rɪˈkwaɪə] <i>v</i> требовать	
requirement [rɪˈkwaɪəmənt] <i>n</i> требование	
rescue [ˈreskjʊː] ~ craft спасательное судно	
research [rɪˈsəːtʃ] <i>v</i> исследовать; <i>n</i> исследовательская работа; do ~	

reverse [rɪ'və:s] *v* поворачиваться в противоположную сторону
revision [rɪ'vɪʒən] *n* повторение, обзор
rich [rɪʃ] *a* богатый
right [raɪt] *a* правый, правильный; *n* право; ~ **kind of** правильный; ~ **on** сразу; **in the ~ way** правильно
ring [rɪŋ] *n* кольцо
rise (rose, risen) [raɪz, rəʊz, 'rɪzn] *v* подниматься, увеличиваться, вставать
road [rəʊd] *n* дорога
rocket ['rɒkɪt] *n* ракета; *a* реактивный, ракетный
roll [rəʊl] *v* прокатывать; вальцевать
roller ['rəʊlə] *n* ролик; валик
rolling ['rəʊlɪŋ] *n* прокатка, вальцевание; *a* роликовый; вращающийся; поворотный
roof [ru:f] *n* крыша
rotary ['rəʊtəri] *a* вращательный, ротационный
round [raʊnd] *a* круглый; *adv* вокруг
route [ru:t] *n* маршрут, курс, путь, дорога
row [rəʊ] *n* ряд
ruin [ruɪn] *n* гибель, крушение; *v* разрушать, разорять
rule [ru:l] *n* власть, правило; **as a ~** как правило; *v* править, управлять
run (ran, run) [rʌn, ræn, rʌn] *v* бежать, бегать; работать (*о машине*), действовать, эксплуатировать; ~**ing engine** работающий двигатель
rural ['ruərəl] *a* сельский, деревенский

S

safe [seɪf] *a* безопасный, надежный
safely ['seɪfli] *adv* благополучно
safety ['seɪftɪ] *n* безопасность; ~ **device** предохранительное устройство; ~ **measures** меры безопасности, меры предосторожности; ~ **warning** сигнал предупреждения
sail [seɪl] *v* плыть под парусами; ~ **boat** парусное судно
sailor ['seɪlə] *n* матрос
same [seɪm] *a* такой же; **the ~** то же самое; **in the ~ way** так же, таким же способом
sample ['sɑ:mpl] *n* образец, проба
sand [sænd] *n* песок
satellite ['sætələɪt] *n* спутник
satisfactory [sætɪs'fæktəri] *a* удовлетворительный
satisfy ['sætɪsfaɪ] *v* удовлетворять
save [seɪv] *v* экономить, спасать
saving ['seɪvɪŋ] *a* экономный, бережливый; *n* экономия, сбережение, спасение
scale [skeɪl] *n* масштаб, шкала, размер
scan [skæn] *v* разлагать изображение, сканировать, пристально разглядывать, изучать
scanning ['skænɪŋ] *n* развертка, сканирование
scarcely ['skɛəsli] *adv* едва, как только
scattered ['skætəd] *a* разбросанный
schedule ['ʃedju:l] *n* график, план
scheme [ski:m] *n* схема, план
scholar ['skɒlə] *n* ученый; образованный человек

school [sku:l] *n* школа; училище; научное направление

science ['saɪəns] *n* наука

scientific [,saɪən'tɪfɪk] *a* научный

scientist ['saɪəntɪst] *n* ученый

screen [skri:n] *n* экран, щит, перегородка; *v* защищать, отгораживать, прикрывать

screw [skru:] *n* винт; *v* завинчивать

sea [si:] *n* море; *a* морской

seagoing ['si:gəʊɪŋ] *n* мореходство

seal [si:l] *n* изоляция; *v* изолировать; запечатывать

seaman ['si:mən] *n* моряк

search [sə:tʃ] *n* поиск; исследование; изыскание; *v* искать, исследовать

seat [si:t] *n* место для сидения, сиденье; *v* усаживать, сесть, садиться

secondary ['sekəndəri] *a* средний (об образовании)

section ['sekʃən] *n* разрез, сечение, профиль, отдельная деталь, узел (машины), блок

seem [si:m] *v* казаться

seize [si:z] *v* схватывать, ухватить

seldom ['seldəm] *adv* редко

select [sɪ'lekt] *v* выбирать

self-governing ['self'gʌvənɪŋ] *a* самоуправляющийся

self-moving ['self'mu:vɪŋ] *a* самодвигающийся

self-propelled ['selfprə'peld] *a* самоходный

sell (sold) [sel, səʊd] *v* продавать

semiconductor ['semɪkən'dʌktə] *n* полупроводник; *a* полупроводниковый

send (sent) [send, sent] *v* посылать; отправлять; передавать (*no radio*); ~ **back** возвращать; ~ **for** посылать за чем-либо (кем-либо)

senior ['si:njə] *n* старший; студент последнего курса; ~ **assistant** старший преподаватель в университете

sense [sens] *n* чувство, ощущение

sensitive ['sensɪtɪv] *a* чувствительный, восприимчивый

sensor ['sensə] *n* сенсор, датчик

sensory ['sensəri] *a* чувствительный, сенсорный

separate ['sepəreɪt] *v* отделять(ся), разъединять(ся); ['seprɪt] *a* отдельный

sequence ['si:kwəns] *n* последовательность; ход событий

series ['siəri:z] *n* ряд, серия; *a* ~ **of** несколько, ряд

serious ['siəriəs] *a* серьезный; важный

serve [sə:v] *v* служить

service ['sə:vɪs] *n* служба, заслуги, эксплуатация; *v* обслуживать; **in** ~ в эксплуатационных условиях

session ['seʃən] *n* заседание, сессия

set [set] *n* набор, комплект, установка, приемник; *v* помещать, устанавливать; ~ **a task** поставить перед кем-либо задачу; начинаться, наступать, устанавливаться; ~ **in motion** приводить в движение; ~ **up** учреждать, устанавливать, организовывать

settlement ['setlmənt] *n* поселение, колония

several ['sevrəl] *a* несколько; ~ **times** несколько раз

severe [si'viə] *a* жесткий, тяжелый, сильный; ~ **stresses** большие напряжения
sewing ['səʊɪŋ] *n* шитье
shaft [ʃɑ:ft] *n* вал, ось
shake (shook, shaken) [ʃeɪk, ʃʊk, 'ʃeɪkn] *v* качать(ся), потрясать; ~ **hands** пожать руки; ~ **one's head** покачать головой в знак отрицания; **to be** ~**en** быть потрясенным
shape [ʃeɪp] *n* форма, очертание, конфигурация; *v* придавать форму
share [ʃɛə] *n* часть, доля; ~ **of data** обмен данными
sharp [ʃɑ:p] *a* резкий; острый
shatter ['ʃætə] *v* расшатывать, колебать, разрушить (*представление*)
sheet [ʃi:t] *n* лист (*бумаги, металла*), простыня
shell [ʃel] *n* оболочка, снаряд; *v* обстреливать
shine (shone) [ʃaɪn, ʃɒn] *v* светить(ся), сиять, блестеть
ship [ʃɪp] *n* корабль, пароход; **on board** ~ на борту корабля; *v* отправлять, перевозить
shipbuilding ['ʃɪp,bɪldɪŋ] *n* кораблестроение
shipyard ['ʃɪpjɑ:d] *n* верфь, судостроительный завод
shock [ʃɒk] *n* удар, толчок, потрясение; ~ **resistance** ударостойкий
shop [ʃɒp] *n* магазин, цех, мастерская
shore [ʃɔ:] *n* берег; *a* береговой
short [ʃɔ:t] *a* короткий
shortage ['ʃɔ:tɪdʒ] *n* нехватка, недостаток, дефицит
shot [ʃɒt] *n* выстрел
shout [ʃaʊt] *v* кричать

show (showed, shown) [ʃəʊ, ʃəʊd, 'ʃəʊn] *v* показывать
shower ['ʃaʊə] *n* душ
shut (shut) [ʃʌt] *v* затворять; закрывать
side [saɪd] *n* сторона, бок; *a* боковой
sight [saɪt] *n* вид
sign [saɪn] *v* подписывать
signal ['sɪgnl] *n* сигнал; *v* сигнализировать, подавать сигнал
signature ['sɪgnɪʃə] *n* подпись
significance [sɪg'nɪfɪkəns] *n* значение, значимость
significant [sɪg'nɪfɪkənt] *a* важный, значительный
silicon ['sɪlɪkən] *n* кремний
silver ['sɪlvə] *a* серебряный
similar ['sɪmɪlə] *a* подобный, одинаковый
similarity [ˌsɪmɪ'lærɪtɪ] *n* подобие, сходство
similarly ['sɪmɪləri] *adv* так же, подобным образом
simple ['sɪmpl] *a* простой; ~ **shape** изделие простой конфигурации
simplicity [sɪm'plɪsɪtɪ] *n* простота
simplify ['sɪmplɪfaɪ] *v* упрощать
simulate ['sɪmjuleɪt] *v* моделировать, воспроизводить
simultaneous [ˌsɪmə'lteɪnjəs] *a* одновременный
since [sɪns] *adv* с тех пор; *prp* с, после; *cj* с тех пор как, так как, поскольку
single ['sɪŋgl] *a* один, единственный, отдельный
sink (sank, sunk) [sɪŋk, sæŋk, slŋk] *v* тонуть, погружаться
site [saɪt] *n* участок; местонахождение; **delivery** ~ место доставки;

construction ~ строительная площадка

situated ['sitjuetɪd] *a* расположенный, находящийся

situation [ˌsitju'eɪʃən] *n* ситуация, положение

size [saɪz] *n* размер

skill [skɪl] *n* умение, искусство, мастерство, квалификация

skilled [skɪld] *a* квалифицированный, умелый

skin [skɪn] *n* кожа

sky [skaɪ] *n* небо, небеса

skyscraper ['skaɪ,skreɪpə] *n* небоскреб

slightly ['slaɪtli] *adv* слегка, немного

slow [sləʊ] *a* медленный; ~ **down** *v* замедлить

small [smɔ:l] *a* небольшой

smile [smɑɪl] *v* улыбаться; *n* улыбка

smog [smɒɡ] *n* густой туман с дымом и копотью; смог

smoke [sməʊk] *v* курить; *n* дым

snappy ['snæpɪ] *a* живой, энергичный

so [səʊ] *adv* так, таким образом; ~ **as to** так, чтобы; ~ **called** так называемый; ~ **that** так, чтобы

society [sə'saɪətɪ] *n* общество

soft [sɒft] *a* мягкий; ~ **landing** мягкая посадка

soil [sɔɪl] *n* почва, земля, грунт

solar ['səʊlə] *a* солнечный

solid ['sɒlɪd] *a* твердый, плотный, сплошной; *n* твердое тело

solidification [səˌlɪdɪfɪ'keɪʃən] *n* затвердевание, застывание

solution [sə'lu:ʃən] *n* решение; раствор

solve [sɒlv] *v* решать (задачу)

soon [su:n] *adv* скоро, вскоре; ~ **after** вскоре после того, как; **as** ~ **as** как только, как можно скорее

sophisticated [sə'fɪstɪkeɪtɪd] *pp* сложный, изощренный, утонченный

sorry ['sɒrɪ] **to be** ~ сожалеть

sort [sɔ:t] *n* сорт, тип, вид; **all** ~s of всякие, самые разнообразные

sound [saʊnd] *n* звук; *a* звуковой, хороший, прочный; ~ **education** хорошее образование

source [sɔ:s] *n* источник

space [speɪs] *n* космос, пространство; ~ **craft** космический корабль; ~ **engineering** космическая техника; ~ **exploration** космическое исследование; ~ **flight** космический полет; ~ **ship** космический корабль; ~ **probe** космический зонд

spark [spɑ:k] *n* искра; ~ **plug** свеча зажигания

special ['speʃəl] *a* специальный, особый

speciality [ˌspeʃɪ'ælɪtɪ] *n* специальность

specialization [ˌspeʃəlaɪ'zeɪʃən] *n* специализация

specialize ['speʃəlaɪz] *v* специализироваться

specific [spɪ'sɪfɪk] *a* особый, характерный, специфический; ~ **impulse** удельный импульс

specification [ˌspesɪfɪ'keɪʃən] *n* детализация; инструкция по обращению; спецификация

specify ['spesɪfaɪ] *v* точно определять, устанавливать, давать спецификацию

specimen ['spesɪmɪn] *n* образец, экземпляр

spectacular [spek'tækjulə] *a* эффектный, захватывающий

speed [spi:d] *n* скорость; ~ **up** *v* ускорять

spend (**spent**) [spend, spent] *v* проводить, тратить

spill (**spilt**, **spilled**) [spɪl, spɪlt, spɪld] *v* проливать(ся), расплескивать(ся)

splendid ['splendɪd] *a* великолепный, роскошный

spoke [spəʊk] *n* спица

sponsor ['spɒnsə] *n* устроитель, организатор, покровитель

spoon [spu:n] *n* ложка

spread (**spread**) [spred] *v* распространять(ся)

square [skwɛə] *n* площадь, квадрат; *a* квадратный; ~ **rooting** извлечение квадратного корня

squeeze [skwi:z] *v* сжимать, сдавливать; ~ **out** выдавливать

stable ['steɪbl] *a* стойкий, устойчивый, прочный, постоянный, стабильный

stabilizer ['steɪbɪlaɪzə] *n* стабилизатор

staff [stɑ:f] *n* персонал, штат

stage [steɪdʒ] *n* стадия, ступень

stamp [stæmp] *n* марка; **postage** ~ почтовая марка

standard ['stændəd] *n* стандарт, норма, образец; ~ **of living** жизненный уровень

standpoint ['stændpɔɪnt] *n* точка зрения

start [stɑ:t] *v* начинать, запускать, отправляться, заводить двигатель; ~ **for** отправляться куда-либо; ~ **ing point** начало, отправная точка

starter ['stɑ:tə] *n* стартер, пусковой прибор

state [steɪt] *n* государство, положение, состояние; *a* государственный; *v* гласить, устанавливать, излагать, формулировать

statement ['steɪtmənt] *n* формулировка, определение, утверждение; ~ **of the problem** постановка задачи

state-of-art [steɪt əv 'ɑ:t] *n* современное состояние; *a* современный

station ['steɪʃən] *n* станция, пункт, позиция, местоположение

stationary ['steɪʃnəri] *a* неподвижный, закрепленный, стационарный

stay [steɪ] *v* оставаться, остановиться, гостить у кого-либо

staying ['steɪɪŋ] *a* ~ **power** возможность оставаться в воздухе длительное время

steady ['stedɪ] *a* устойчивый, постоянный

steam [sti:m] *n* пар; *a* паровой; ~ **generation** парообразование

steel [sti:l] *n* сталь; **stainless** ~ коррозионно-стойкая сталь; *a* стальной

step [step] *n* шаг, ступень; *v* шагнуть

still [stɪl] *adv* все еще, однако, до сих пор

stone [stəʊn] *n* камень; *a* каменный

stop [stop] *v* останавливаться, прекращать

storage ['stɔ:ɡɪdʒ] *n* склад, хранилище; ~ **section** запоминающее устройство ЭВМ

store [stɔ:] *v* накапливать, собирать, хранить; *n* магазин

- storey** ['stɔ:ri] *n* этаж
- story** ['stɔ:ri] *n* рассказ, история
- straight** [streɪt] *a* прямой; *adv* прямо
- strange** [streɪndʒ] *a* странный
- stream** [stri:m] *n* поток, струя
- streamlined** ['stri:mlaɪnd] *a* обтекаемый
- strength** [streŋθ] *n* прочность; ~ **of materials** сопротивление материалов
- strengthen** ['streŋθən] *v* укреплять
- stress** [stres] *n* напряжение, усилие, стресс; *v* подвергать нагрузке, напряжению, давлению
- stretch** [stretʃ] *v* растягивать, натягивать, удлинять
- strike** (**struck, stricken**) [straɪk, strʌk, 'strikn] *v* наносить удар, поражать, производить впечатление
- striking** ['straɪkɪŋ] *a* поразительный
- stroke** [strəʊk] *n* удар; ход (*поршня*), такт
- strong** [strɒŋ] *a* сильный, прочный
- structural** ['strʌktʃərəl] *a* структурный; ~ **parts** конструкционные детали
- structure** ['strʌktʃə] *n* сооружение, конструкция, структура
- student body** ['stju:dənt bɒdɪ] *n* число студентов (*в учебном заведении*)
- study** ['stʌdɪ] *n* изучение, исследование; *v* изучать, учить
- stupid** ['stju:pɪd] *a* глупый, бестолковый
- subject** ['sʌbdʒɪkt] *n* предмет, тема, вопрос; *v* [səb'dʒekt] подвергать
- submerge** [səb'mə:dʒ] *v* погружать(ся)
- submersible** [səb'mə:səbl] *a* погружаемый, пригодный для действия под водой; *n* спускаемый, погружаемый аппарат
- subsequent** ['sʌbsɪkwənt] *a* последующий
- substance** ['sʌbstəns] *n* вещество
- substitute** ['sʌbstɪtju:t] *v* заменять
- suburb** ['sʌbə:b] *n* пригород; *pl* предместья, окрестности
- succeed** [sək'si:d] (**in**) *v* удаваться (*сделать что-либо*), следовать; ~**ing** последующий
- success** [sək'ses] *n* успех; **to be a ~** иметь успех, быть удачным
- such** [sʌʃ] такой; ~ **as** такой как, подобный; **in ~ a way** таким образом
- sudden** ['sʌdn] *a* внезапный
- suddenly** ['sʌdnli] *adv* внезапно, вдруг
- suffer** ['sʌfə] *v* страдать, испытывать, претерпевать
- sufficient** [sə'fɪʃənt] *a* достаточный; *n* достаточное количество
- suffix** ['sʌfɪks] *n* суффикс
- suggest** [sə'dʒest] *v* предлагать, рекомендовать, советовать
- suit** [sju:t] *v* удовлетворять требованиям, быть удобным, устраивать, быть пригодным
- suitable** ['sju:təbl] *a* подходящий, пригодный, удобный
- sum** [sʌm] *n* сумма; *v* ~ **up** складывать, суммировать
- superintendent** [ˌsju:pərɪn'tendənt] *n* управляющий
- superior** [sju:'piəriə] *a* лучший, превосходный, превосходящий

supplement ['sʌplɪmənt] *n* дополнение, добавление; *v* ['sʌplɪment] пополнять, добавлять

supply [sə'plai] *v* снабжать, доставлять, поставлять, сообщать (энергию); *n* запас

support [sə'pɔ:t] *v* поддерживать; *n* опора, подставка; **life** ~ жизнеобеспечение

supporter [sə'pɔ:tə] *n* приверженец, сторонник

suppose [sə'pəʊz] *v* предполагать, полагать

suppression [sə'preʃən] *n* подавление

sure [ʃuə] *a* уверенный; **to be** ~ быть уверенным; **to get** ~ удостовериться, убедиться

surely ['ʃuəli] *adv* конечно, непременно

surface ['sə:fɪs] *n* поверхность; *a* наружный

surpass [sə:'pɑ:s] *v* превышать, превосходить

surprise [sə'praɪz] *v* удивлять, поражать, *n* неожиданность

surprising [sə'praɪzɪŋ] *a* удивительный, поразительный

surprisingly [sə'praɪzɪŋli] *adv* удивительно, необычайно, неожиданно

surround [sə'raʊnd] *v* окружать

surrounding [sə'raʊndɪŋ] *a* близлежащий, соседний

survey ['sə:veɪ] *n* обозрение, обследование, изыскание; [sə'veɪ] *v* осматривать, делать обзор, производить изыскания

survival [sə'vaɪvəl] *n* выживание, оставшийся в живых, выживший

switch [swɪʃ] *n* выключатель, переключатель; *v* переключать; ~ **off**

выключать; ~ **on** включать; ~ **over** переключать(ся)

sword [sɔ:d] *n* меч, сабля, шпага

system ['sɪstɪm] *n* система

Т

table ['teɪbl] *n* стол; таблица

take (took, taken) [teɪk, tuk, 'teɪkn] *v* брать; ~ **away** забирать, убирать; ~ **care of** позаботиться о; ~ **courses** прослушать курс; ~ **examinations** сдавать экзамены; ~ **interest in** заинтересоваться чем-либо; ~ **into account** принять во внимание (в расчет); ~ **the opportunity** использовать возможность; ~ **part** принимать участие; ~ **pity on** пожалеть; ~ **place** происходить; ~ **steps** предпринимать шаги; ~ **time** отнимать время; ~ **a train** садиться в поезд; **take off** *n* взлет; *v* взлетать

talk [tɔ:k] *v* разговаривать, беседовать; *n* беседа

tank [tæŋk] *n* бак, бассейн, танк

tape [teɪp] *n* лента, пленка (для магнитной записи)

tape-recorder ['teɪprɪ,kɔ:də] *n* магнитофон

task [tɑ:sk] *n* задача

tax ['tæks] *n* налог

tea [ti:] *n* чай

teach (taught) [ti:tʃ, tɔ:t] *v* учить, обучать, преподавать

teacher ['ti:tʃə] *n* преподаватель

technical ['tekɪnɪkəl] *a* технический

technique [tek'ni:k] *n* техника, способы, методы, технические приемы

technological [tek'nɒlədʒɪkəl] *a* технологический

technology [tek'nɒlədʒɪ] *n* технология

telegram ['telɪgræm] *n* телеграмма
telegraph ['telɪgrɑ:f] *n* телеграф
telephone ['telɪfəʊn] *n* телефон;
a телефонный
television ['telɪvɪzən] *n* телевидение;
a телевизионный
tell (told) [tel, təʊld] *v* сказать, сообщить
temperature ['temprɪtʃə] *n* температура
tend [tend] *v* иметь тенденцию (*к чему-либо*)
tendency ['tendənsɪ] *n* тенденция, стремление
term [tə:m] *n* термин, выражение, семестр; **long** ~ долгосрочный
territory ['terɪtəri] *n* территория
test [test] *v* испытывать, исследовать, пробовать, проверять; *n* испытание, проба, проверка; ~ **work** контрольная работа
than [ðæn] *conj* чем; **he is taller ~ you** он выше вас (чем вы)
thank [θæŋk] *v* благодарить; **thanks to** благодаря
that is (i.e.) то есть; **that is why** вот почему
then [ðen] *adv* тогда, затем; **the ~** тогдашний, существовавший в то время
thereby ['ðeə'baɪ] *adv* таким образом
therefore ['ðeəfɔ:] *adv* поэтому
thermal ['θə:məl] *a* тепловой, термический
thick [θɪk] *a* толстый
thin [θɪn] *a* тонкий
thing [θɪŋ] *n* вещь; **one ~** одно
think (thought) [θɪŋk, θɔ:t] *v* думать
thinking ['θɪŋkɪŋ] *n* мышление

thorough ['θɒrə] *a* глубокий, тщательный; ~ **knowledge** глубокие знания
thoroughly ['θɒrəli] *adv* тщательно, глубоко, основательно
though [ðəʊ] *conj* хотя; **as ~** как если бы, как будто
thought [θɔ:t] *n* мысль
threshold ['θreʃhəʊld] *n* порог, отправной пункт, начало
through [θru:] *prp* через, сквозь
throughout [θru:'aʊt] *adv* всюду, по, на протяжении, по всему (*сечению*)
thrust [θrʌst] *n* давление, нагрузка, тяга
thus [ðʌs] *adv* таким образом, так
till [tɪl] *prp* до; *conj* до тех пор пока
time [taɪm] *n* время, период времени, раз; **many ~s** много раз; ~ **table** расписание; *v* рассчитывать по времени; **by the ~** к тому времени как; **in ~** вовремя; **for the ~** ~ **being** в данное время
tin [tɪn] *n* олово
tiny ['taɪni] *a* крошечный
tired ['taɪəd] *a* утомленный, усталый
title ['taɪtl] *n* заглавие, название, заголовок
to-day [tə'deɪ] *adv* в настоящее время, сегодня; **of ~** современный
together [tə'geðə] *adv* вместе
too [tu:] *adv* тоже, также, слишком
tool [tu:l] *n* инструмент, станок
top [tɒp] *n* верхушка, верх, верхняя часть
total ['təʊtl] *n* сумма, итог; *v* подсчитывать, насчитывать, равняться; *a* весь, целый

- touch** [tʌʃ] *υ* притрагиваться, прикасаться; *n* прикосновение; ~ **down** посадка, приземление
- tough** [tʌf] *a* вязкий, тягучий; жесткий, плотный; упругий, стойкий, крепкий
- toughness** ['tʌfnɪs] *n* ударная вязкость, тягучесть, жесткость, прочность
- tour** [tuə] *n* обход, прогулка
- towards** [tə'wɔ:dz] *prp* по направлению к чему-либо, по отношению к чему-либо
- tower** ['taʊə] *n* башня, вышка; **the Tower** Тауэр (в Лондоне)
- track** [træk] *n* след; дорожка; слежение, сопровождение
- trade** [treɪd] *n* ремесло, профессия; торговля
- tradition** [trə'dɪʃən] *n* традиция
- traditional** [trə'dɪʃənəl] *a* традиционный
- traffic** ['træfɪk] *n* движение (уличное)
- train** [treɪn] *n* поезд; *υ* обучать
- training** ['treɪnɪŋ] *n* подготовка; ~ **course** курс обучения
- transducer** [trænz'dju:sə] *n* преобразователь, датчик
- transform** [træns'fɔ:m] *υ* преобразовывать
- transformation** [trænsfə'meɪʃən] *n* преобразование
- transformer** [træns'fɔ:mə] *n* преобразователь, трансформатор
- transistor** [træn'zɪstə] *n* транзистор, транзисторный приемник
- transition** [træn'sɪʒən] *n* переход
- transitional** [træn'sɪʒənəl] *a* переходный, промежуточный
- transmission** [trænz'mɪʃən] *n* передача
- transmit** [trænz'mɪt] *υ* передавать (*no radio*)
- transparency** [træns'pɛərənsɪ] *n* прозрачность
- transparent** [træns'pɛərənt] *a* прозрачный
- travel** ['trævl] *υ* путешествовать, перемещаться, двигаться; *n* путешествие, передвижение, перемещение
- tray** [treɪ] *n* поднос
- treat** [tri:t] *υ* обрабатывать, обращаться с чем-либо
- treatment** ['tri:tment] *n* обработка
- tremendous** [tri'mendəs] *a* громадный
- trend** [trend] *n* направление, тенденция
- triangulation** [traɪ,æŋɡju'leɪʃən] *n* разбивка на треугольники; тригонометрическая съемка
- trick** [trɪk] *n* хитрость, обман; **to play a ~** сыграть шутку, обмануть
- trouble** ['trʌbl] *n* неприятности, затруднение, беда
- true** [tru:] *a* правильный, истинный
- truly** ['tru:lɪ] *adv* поистине
- trust** [trʌst] *n* доверие; ответственность, долг; *υ* доверять, полагаться
- try** [traɪ] *υ* пытаться, пробовать
- tube** [tju:b] *n* трубка, труба
- tuition** [tju:'ɪʃən] *n* обучение
- turn** [tɜ:n] *υ* поворачиваться; ~ **against** обернуться против; ~ **one's attention** обратить внимание на; ~ **back** обернуться, снова обратиться; ~ **into** превратиться; ~ **round** обернуться; ~ **off (on)** выключить (включить); ~ **out** оказываться; ~ **to** обратиться к чему-

либо; ~ **up** выявиться, оказаться;
in its ~ в свою очередь

tutor ['tju:tə] *n* наставник (*в Оксфорде, Кэмбридже*)

TV ['ti:vi] *n* телевидение, телевизор; *a* телевизионный

twice [twais] *adv* дважды

twin [twɪn] *a* двойной, сдвоенный

type [taɪp] *n* тип, вид

typical ['tɪpɪkəl] *a* типичный

typing ['taɪpɪŋ] *n* переписка на машинке, машинопись

U

unable ['ʌn'eɪbl] *a* неспособный;
to be ~ не быть в состоянии

unamenable ['ʌnə'mi:nəbl] *a* неподатливый, непослушный

unbelievable [ˌʌnbɪ'li:vəbl] *a* невероятный

uncertain [ʌn'sə:tn] *a* неуверенный; **to be** ~ сомневаться

under ['ʌndə] *prp* под; ~ **certain conditions** при определенных условиях; ~ **consideration** данный, рассматриваемый; ~ **investigation** исследуемый; **to be** ~ **way** проводиться, строиться в данный момент

undergo (**underwent**, **undergone**) [ˌʌndə'gəʊ, ˌʌndə'went, ˌʌndə'gɒn] *v* подвергаться чему-либо

undergraduate [ˌʌndə'grædjʊɪt] *n* студент

underground ['ʌndəgraʊnd] *n* метро; *a* подземный

underwater ['ʌndə'wɔ:tə] *a* подводный

undiscovered [ˌʌndɪs'klʌvəd] *a* неоткрытый, обнаруженный

undoubtable ['ʌn'daʊtəbl] *a* несомненный, бесспорный

uneven ['ʌn'i:vən] *a* неровный, шероховатый

unexpected ['ʌnɪks'pektɪd] *a* неожиданный

unfortunately [ʌn'fɔ:tʃnɪtli] *adv* к несчастью, к сожалению

uniform ['ju:nɪfɔ:m] *a* равномерный, однородный, одинаковый

unit ['ju:nɪt] *n* единица измерения; единица; агрегат, блок, установка, узел, устройство, прибор

universal [ˌju:nɪ'və:səl] *a* всеобщий

universally [ˌju:nɪ'və:səli] *adv* везде, всюду

universe ['ju:nɪvə:s] *n* мир, вселенная

university [ˌju:nɪ'və:sɪti] *n* университет; *a* университетский

unknown ['ʌn'nəʊn] *a* неизвестный

unless [ən'les] *conj* если не

unlike ['ʌn'laɪk] *a* неодинаковый; *prp* в отличие от

unlikely [ʌn'laɪklɪ] *adv* едва ли, маловероятно

unlimited [ʌn'lɪmɪtɪd] *a* безграничный, беспредельный

unload ['ʌn'ləʊd] *v* разгружать

unquestionable [ʌn'kwɛstʃənəbl] *a* несомненный, неоспоримый

unsolved ['ʌn'sɒlvd] *a* нерешенный

unthinkable [ʌn'θɪŋkəbl] *a* невообразимый, немыслимый

until [ən'tɪl] *conj* до тех пор пока не; *prp* до

unused ['ʌn'ju:zd] *a* неиспользованный

unusual [ʌn'ju:zuəl] *a* необычный

up to ['ʌp tə] *prp* до; **up-to-date** *a* современный

upon [ə'pɒn] *prp* на
urban ['ə:bən] *a* городской
usable ['ju:zəbl] *a* пригодный для употребления
usage ['ju:zɪdʒ] *n* употребление, использование
use [ju:s] *n* польза, употребление;
in ~ в эксплуатации; *v* [ju:z] использовать, употреблять
useful ['ju:sfʊl] *a* полезный
usefulness ['ju:sfʊlnɪs] *n* польза
useless ['ju:sɪs] *a* бесполезный
user ['ju:zə] *n* потребитель
usual ['ju:zuəl] *a* обычный
usually ['ju:zuəli] *adv* обычно
utilize ['ju:tɪlaɪz] *v* использовать

V

vacation [və'keɪʃən] *n* каникулы
vacuum ['vækjuəm] *n* вакуум; ~
chamber вакуумная камера
valid ['vælɪd] *a* ценный, обоснованный
value ['vælju:] *n* ценность, значение, величина
valve [vælv] *n* клапан; электронная лампа
vaporize ['veɪpəraɪz] *v* испарять(ся)
varied ['vɛərɪd] *a* разнообразный, различный
variety [və'raɪəti] *n* разнообразие, большое число; **a large ~ of** самые разнообразные
various ['vɛərɪəs] *a* различный, разнообразный; ~ **kinds of** разные, разнообразные
vary ['vɛəri] *v* менять(ся), изменять(ся)
vast [vɑ:st] *a* огромный, обширный

vehicle ['vi:ɪkl] *n* любое средство передвижения (*автомобиль, летательный аппарат и т.п.*)
velocity [vɪ'ləsɪti] *n* скорость
Venus ['vi:nəs] *n* Венера
versatile ['vɜ:sətəɪl] *a* разносторонний, гибкий
versatility [ˌvɜ:sə'tɪlɪti] *n* многосторонность
version ['vɜ:ʃən] *n* вариант; версия
vertical ['vɜ:tɪkəl] *a* вертикальный
very ['veri] *adv* очень; **the** ~ тот самый; ~ **much** очень много
via ['vaɪə] *prp* через (*лат.*)
vibrate [vaɪ'breɪt] *v* вибрировать
vibration [vaɪ'breɪʃən] *n* колебание, вибрация
vice versa ['vaɪsɪ'vɜ:sə] *adv* наоборот (*лат.*)
vicinity [vɪ'sɪnɪti] *n* соседство, близость; **Moscow** ~ Подмосковье
victory ['vɪktəri] *n* победа
view [vju:] *n* вид; *v* осматривать, рассматривать
village ['vɪlɪdʒ] *n* деревня
violin [ˌvaɪə'lɪn] *n* скрипка
virtue ['vɜ:tʃu:] *n* достоинство; **by** ~ благодаря чему-либо
virtually ['vɜ:tʃuəli] *adv* фактически, в сущности, поистине
visible ['vɪzəbl] *a* видимый
vision ['vɪzən] *n* зрение, видение;
night ~ ночное видение
visit ['vɪzɪt] *n* посещение, визит; *v* посещать, навещать
visual ['vɪzjuəl] *a* зрительный, видимый
vital ['vaɪtl] *a* жизненно важный; существенный
vocational [vəu'keɪʃənəl] *a* профессиональный

voice [vɔɪs] *n* голос

voltage ['vəʊltɪdʒ] *n* напряжение, вольтаж

voltmeter ['vəʊlt,mi:tə] *n* вольтметр

volume ['vɒljʊm] *n* том, книга, объем

W

wait [weɪt] *v* ждать, ожидать

walk [wɔ:k] *v* ходить, гулять; ~ **about** прогуливаться; *n* прогулка

wall [wɔ:l] *n* стена

wander ['wɒndə] *v* бродить, отклоняться

want [wɒnt] *v* хотеть

war [wɔ:] *n* война

warm [wɔ:m] *a* теплый

warming ['wɔ:mɪŋ] *n* нагревание, подогревание

warmth [wɔ:mθ] *n* тепло

warn [wɔ:n] *v* предупреждать, предостерегать

warning ['wɔ:nɪŋ] *n* предупреждение, предостережение; **safety** ~ сигнал предупреждения

warrior ['wɔ:riə] *n* борец, воин

wash [wɔʃ] *n* мытье; ~**ing machine** стиральная машина

waste [weɪst] *n* отходы, отбросы; *v* тратить впустую; стать полностью непригодным к употреблению

watch [wɔʃ] *v* наблюдать, следить, сторожить; *n* часы

water ['wɔ:tə] *n* вода; *a* водный; ~ **system** водопровод

watertight ['wɔ:tətəɪt] *a* водонепроницаемый

wave [weɪv] *n* волна

wavy ['weɪvɪ] *a* волнистый

way [weɪ] *n* путь, дорога, способ; **in such a** ~ таким образом, так что; **in this** ~ таким образом; ~ **out** выход из положения; **to be under** ~ проводиться; **to give** ~ уступать (*дорогу*)

weak [wi:k] *a* слабый

weapon ['wepən] *n* оружие

wear (**wore, worn**) [weə, wɔ:, wɔ:n] *v* носить (*одежду*)

weather ['weðə] *n* погода

week [wi:k] *n* неделя; ~ **day** будничный день; ~ **end** время от субботы до понедельника (уик-энд)

weigh [weɪ] *v* взвешивать

weight [weɪt] *n* вес; **by** ~ по весу

weightlessness ['weɪtlɪsnɪs] *n* невесомость

welding ['weldɪŋ] *a* сварной; ~ **techniques** способы сварки, сварочные процессы

well [wel] *adv* хорошо; **as** ~ также; **as** ~ **as** так же как; ~-**known** хорошо известный, популярный

wheel [wi:l] *n* колесо; *v* повернуть
whenever [wen'evə] *conj* когда бы ни, всякий раз когда

whereas [weə'ræz] *conj* тогда как; несмотря на то, что

whichever [wɪtʃ'evə] *conj* какой угодно, какой бы ни

while [waɪl] *conj* в то время как; ~ **speaking** разговаривая; **for a** ~ на время

whole [həʊl] *a* весь, целый; **the** ~ **of** весь, целый; **as a** ~ в целом

why [waɪ] *adv* почему; **that is** ~ вот почему

wide [waɪd] *a* широкий, обширный; **a** ~ **range of** много, большое число; **a** ~ **variety of** самые разно-

образные; ~ **screen** широкоэкранный

widely ['waɪdlɪ] *adv* широко; ~ **different** совершенно различные, неодинаковые; ~ **used** широко используемые

widen ['waɪdn] *v* расширять

width [wɪðθ] *n* ширина

wife [waɪf] *n* жена

will [wɪl] *v* хотеть, желать; **to be ~ing** очень хотеть; *n* воля; **good ~** добрая воля

willingly ['wɪlɪŋli] *adv* охотно

win (won) [wɪn, wʌn] *v* выигрывать; ~ **a prize** получить премию; ~ **a recognition** завоевать признание

wind [wɪnd] *n* ветер; ~ **screen** ['wɪndskri:n] *n* переднее ветровое стекло

wire ['waɪə] *n* проволока, провод; ~ **telegraph** телеграф

wise ['waɪz] *a* мудрый, умудренный (*опытом*)

wish [wɪʃ] *v* желать, хотеть; *n* желание

within [wɪ'ðɪn] *prp* внутри, в пределах

without [wɪ'ðaʊt] *prp* без; ~ **heating** без нагрева

withstand (withstood) [wɪð'stænd, wɪð'stu:d] *v* выдерживать (*нагрузки, температуры*)

wonderful ['wʌndəfʊl] *a* прекрасный, удивительный, замечательный

work [wɜ:k] *v* работать; *n* работа; ~ **out** разрабатывать

workable ['wɜ:kəblɪ] *a* годный для обработки

worker ['wɜ:kə] *n* рабочий

working ['wɜ:kɪŋ] ~ **conditions** условия труда

workshop ['wɜ:kʃɒp] *n* мастерская, цех

world [wɜ:ld] *n* мир; *a* всемирный; ~ **wide** всемирный; ~ **War II** вторая мировая война; **throughout the ~** во всем мире, повсюду

worry ['wʌrɪ] *n* беспокойство, тревога; *v* беспокоить(ся), волноваться

worth [wɜ:θ] *a* достойный; **to be ~** заслуживать, стоить; **to be ~-while** иметь смысл

wrist [rɪst] *n* запястье

wrong [rɒŋ] *a* неправильный, не тот, ошибочный

Y

year [jə:] *n* год; ~**s before** за ... лет до; ... ~**s old** ... лет

yellow ['jeləʊ] *a* желтый

yet [jet] *adv* все еще, однако; *conj* все же

Z

zinc [zɪŋk] *n* цинк

zone [zəʊn] *n* зона, пояс, полоса

ДОПОЛНИТЕЛЬНЫЕ МАТЕРИАЛЫ ДЛЯ ФАКУЛЬТЕТА «ИНЖЕНЕРНЫЙ БИЗНЕС И МЕНЕДЖМЕНТ»

Text 1

Какое влияние оказывает Интернет на бизнес и глобальную экономику? Приведите примеры последних лет.

А. Прочитайте текст и найдите слова, означающие:

work (to be in action), large (substantial), terrible (horrible) experience, deal with, payment for professional service, follow, business deal, trade, in the end, keep a secret, reduce drastically, reduction, very great, offer a price at an auction sale.

Car Giants' Single Online Supply Store

General Motors, Ford Motors and Daimler Chrysler companies have announced plans to open the online auto marketplace, potentially making it the largest Internet business yet created. It will allow suppliers and buyers to automate routine transactions and streamline¹ the bidding process for everything from car windows and fuel-injection parts to paper clips and paint through electronic sales, auctions and «reverse auctions» in which buyers state their needs and receive bids from sellers.

Consumers are not likely to see massive price cuts because of the new system. But it should help automakers keep a lid on retail prices as new features are introduced, such as electronic steering, computerized transmission systems and weight-sensitive air bags. It will also make it possible for customers to order more personalized vehicles and to take delivery of them faster.

General Motors, Ford and Daimler Chrysler will have an equal share of the new company, which is expected to be running by the end of June. They will also open their virtual marketplace to other automakers and could eventually expand the service into other industries, such as aerospace, construction and office supplies.

The joint marketplace is the most powerful sign of the migration of commerce from the old world of salesmen and brick stores to the new virtual world of electronic commerce (e-commerce). It is going to change the way businesses interact with each other by taking out the huge inefficiencies that have been built around the old methods of using the phone and mail.

By using the speed of Internet communications and the power of large computerized databases to handle global sales and purchasing,

the companies hope to control costs, slash production inefficiencies and reduce the logistical nightmare of tracking millions of parts.

«The Internet is transforming every piece of our company and our industry», Ford president said in a statement.

In one of the first purchases made by Ford on its own online marketplace the company was reported to save more than \$10 million.

There will ultimately be more than 100,000 supply companies on the system. The company could become a profit maker since it will collect a fee or commission for every transaction that takes place over the network.

Note to the Text

1. to make more efficient by simplifying

В. Найдите в тексте антонимы слов:

buy, buyer, sale, wholesale price, waste (use more than needed), destroy, increase, loss, small.

С. Составьте возможные словосочетания прилагательных из колонки А и существительных из колонки В:

A	B
1. electronic	a. share
2. routine	b. sales, commerce
3. retail	c. price cuts
4. equal	d. transactions
5. global	e. prices
6. massive	f. marketplace
7. virtual/joint	g. sales and purchasing

Д. Заполните пропуски, образуя составные слова, общеизвестные словосочетания или термины. Запомните их.

auto ...	online ...	profit ...
... clips	... injection	-sensitive ... bag

Упражнение 1. Прочитайте определения наиболее распространенных терминов по маркетингу. Дайте русские эквиваленты выделенных слов. Переведите предложения.

1. **Market** is the total demand for goods.
2. **Market** economy is one in which prices and quantities are determined by **supply** and **demand**.
3. **Marketing** is a theory and practice of large scale selling.

4. The marketing «mix» often referred to as the four Ps includes choosing the right **product** a company produces; selling it at the right **price**; using the right kind of **promotion**, i.e., the ways to make the product popular and well-known by advertising; making it available in the right **place**, where you sell the product and how it reaches the consumer, which is also known as **distribution**.

5. People who buy and use products are called **consumers**.

6. People who buy the products of a particular company are that company's **customers** or **clients**.

7. One of the equal parts into which capital of a company is divided is called a **share**.

8. **Market share** is the % of a market that a company has, e.g., 25 % market share.

9. **Market leader** is the company or product with the largest market share.

10. **Market research** provides information about what people want, need and buy.

11. **Profit** is money made or gained in business.

12. You call the amount you have sold **sales figures**.

13. **Sales target** means the amount you would like to sell in the future.

14. The amount you hope to sell next two years is **sales forecast**.

15. **Sales representative** (usually sales rep) is a person who sells a company's products.

16. The person who runs the **sales or marketing department** is called sales or marketing manager.

17. **To launch** a new product is to introduce a new car onto the market.

18. **The main competitor** is the most important company in the same market.

19. The idea that people have of the company is **the image** of the company.

Упражнение 2. Подберите к словам в колонке А слова-партнеры из колонки В.

A

1. buy
2. buyer
3. buying
4. sale
5. retail
6. export

B

- a. seller
- b. wholesale
- c. increase
- d. sell
- e. demand
- f. loss

7. supply
8. save
9. profit
10. reduce

- g. selling
- h. import
- i. purchase
- j. waste

Упражнение 3. Составьте возможные словосочетания глаголов из колонки А и существительных из колонки В.

А	В
1. make	a. the service
2. cut	b. inefficiency
3. save	c. goods
4. have	d. commission (fee)
5. launch	e. money
6. expand	f. a profit
7. control	g. a new product
8. collect	h. prices
9. automate	i. a share
10. reduce	j. transaction
11. handle	k. costs

Упражнение 4. Заполните пропуски словами:

market leader image customers buying sales figures sales forecast
 profit handle product consumers competitors price sales rep retail
 marketing

1. The company is interested in (1) ... this enterprise, but we find the (2) ... to be too high. 2. The wholesale price is always lower than the (3) ... price. 3. Our marketing manager thinks the company will not make as much (4) ... this year. 4. We do not (5) ... goods of that kind in this company. 5. Everybody was impressed with the (6) ... for the new product. 6. What is your company's (7) ... for the next year? 7. Our main (8) ... are going to take part in a (9) ... conference this week. 8. An experienced (10) ... should have an excellent knowledge of his company's (11) ... , the needs of (12) ... in his particular market and, of course, the needs of their company's most important (13) ... 9. IBM is one of the (14) ... in the USA computer industry. 10. The (15) ... of a company is very important in sales and marketing.

Упражнение 5. Замените одно слово в каждом предложении так, чтобы все предложение приобрело противоположное значение.

1. Nobody thought that the company would lose a lot of money.
2. The company has decided to sell the factory in Leeds.
3. Our sales manager cannot get used to being an unsuccessful businessman.

Упражнение 6. Заполните таблицы на словообразование:

Noun	Adjective	Noun	Adjective
competition	...	sense	...
...	expensive	...	reliable
fashion	...	power	...
availability	...	...	dangerous

Упражнение 7. А. Назовите 20–25 ключевых слов и словосочетаний на тему «Marketing».

В. Speak about:

1. The market leader in the motor car (computer) industry in our country, its market share and main competitors.
2. A car (computer) that has been launched lately.

Text 2

Какие преимущества предлагает Интернет в сфере банковских услуг?
Прочитайте текст и найдите слова, означающие:

a sum of money to be paid in case of accident (loss, etc.), money in one's account, money to be paid for lighting (heating in your house), a manner or way of doing smth., allow to.

Banking on a Web Lifestyle

According to Bill Gates, a well-known winner of MN Golden Certificate from Microsoft, within 5–8 years, and possibly much earlier, many people will manage their finances via the Internet. Each bank will put up Web pages that present its products in an easy-to-use fashion, making it simple for customers to manage money quite well electronically.

If you are a customer, your funds will move automatically to meet your needs. You will easily get answers to questions such as: Am I saving enough? Have I gathered all the information I need to file a tax return (налоговая декларация)? Am I keeping to my budget? How does this month's electric bill compare to the bill for the same month last year?

These changes won't come at the expense of the banking industry. On the contrary, the Web will let companies offer services that meet individual needs, which is an essential advantage.

Productivity improvements tend to produce many more winners than losers. Life gets better when people discover a fundamen-

tally better way to do something important. That is why the Web is unlikely to dehumanize banking or anything else.

The Web will offer banks great opportunities, especially as their services expand to include insurance, advice and a broad range of investments. Some banks will offer to manage your assets (имущество, активы баланса) and provide you with credit. If your checking account balance (баланс счета) gets too high, the bank will offer to move funds into investments that have higher yields (процентный доход).

Banks will advise you to pay down credit-card balances or other loans (заем, ссуда), and let you do it with a click. They will know that if they do not give you this kind of advice and convenience, you are likely to take your business elsewhere.

The Internet is a tool of communication, a place for people as well as for extensive information.

Упражнение 1. Дайте русские эквиваленты выделенным словам. Переведите предложения. Запомните ключевые слова и словосочетания.

1. Businessmen can **lend** (давать займы) and **borrow** (брать займы) money.

2. The money to be borrowed from the bank is called a **loan**.

3. Most companies borrow money to **finance** (i.e., to pay for) **investments** (e.g., equipment they buy in order to do business).

4. If you borrow money from the bank you must pay **interest**. **Interest rate** is per cent (процентная ставка) you should **pay back**.

5. Businesses have to **make a profit**, not to make a loss.

6. To make a profit means to **earn** or receive more money than you **spend**.

7. If a company does not make a profit or a loss, it **breaks even** (рентабельна, безубыточна).

8. The money a company receives for its products is called the **turnover**.

9. The money spent is called the **expenditure**.

10. A company spends money on **raw materials**, **labour** (workers, **employees**, **staff**) and **overheads** (e.g., rent for buildings, electricity, telephone, etc.)

11. In order to **grow** or **expand** and **prosper** (do well, be successful) the companies need low inflation or rate of **inflation** (which means the continuous increase in the price of products), **low interest rates**, **economic and political stability**, a **healthy economy**, not an economy **in recession**, and **tax cuts** as well. Recession is a pe-

riod of reduced and slow business activity. **Tax** is a sum of money to be paid by citizens (according to income, for example) to the government for public purposes.

12. A **trend** is a change or movement of prices, profits, sales, etc. To describe a trend we can use the following expressions:

- The government will **raise** taxes.
- Taxes will **rise (increase, go up)** by 2 % (or to 28 %).
- There will be a **sharp rise** in inflation.
- Taxes will **fall (go down, decrease)** slowly.
- There will be a slow **fall (decrease)** in taxes.
- Prices **are up** by 5 %; profits are down by \$2 million.
- Inflation will probably **remain stable** at around 3 %.

13. **Expenditure** is spending or using money, for example, government expenditure.

Упражнение 2. Замените выделенные слова и словосочетания близким по значению словом или словосочетанием.

1. Our company is **doing well** now. 2. Sales have increased **dramatically**. 3. This came after a **dramatic** fall last year. 4. Profits have **risen** considerably. 5. Our turnover has **gone up** this year. 6. The company is **growing** very quickly. 7. We expect sales **to increase** for about two years. 8. Then they will **fall** slightly. 9. It is necessary to **spend** more money on R&D (Research and Development).

Упражнение 3. Заполните пропуски, образуя составные слова или общеизвестные фразы.

healthy ...	... and loss	credit ...
... stability	interest ...	... return
break ...	... materials	account ...
economy in ...	tax ...	productivity ...
turn ...	over ...	

Упражнение 4. Составьте возможные словосочетания глаголов из колонки А и существительных из колонки В.

A	B
1. finance	a. money on
2. offer	b. services
3. provide with	c. a profit / loss
4. gather	d. needs
5. make	e. investments
6. meet	f. information

7. spend	g. opportunity
8. expand	h. interest
9. lend/borrow	i. credit
10. pay	j. money

Упражнение 5. Заполните таблицу на словообразование.

Verb	Noun	Adjective
educate	...	...
...	...	reducible
...	expenditure	...
differ	...	...
...	payment	...
...	comparison	comparable
...	...	expensive

Упражнение 6. А. Прочитайте текст и постарайтесь догадаться о значении следующих слов и словосочетаний: *unit of account, value, grains, print, consider, cease, cash, withdraw, bank account*.

Money as a Unit of Account

The most difficult aspect of money to understand is its function as a unit of account. Money is difficult to define, because the **value** of anything changes with time and circumstances.

Sir Isaac Newton defined the pound sterling (£) in 1717 as 113 **grains** of pure gold. By the end of the nineteenth century the gold standard had spread around most of the trading world, with the result that there was a single world money. It was called by different names in different countries, but all these supposedly different currencies were interconnected through their particular definition in terms of a quantity of gold.

The end of the gold standard began with the introduction of the agreement in 1946. This fixed the **value** of all world currencies relative to the US dollar, which in turn was fixed to a specific **value** of gold (US \$ 0.35/oz.) However, in 1971 the US government finally refused to exchange US dollar for gold, and other countries soon followed. Governments **printed** as much paper money or coinage as they wanted, and the more that was printed, the less each unit of currency was worth.

The great advantage of the nineteenth-century gold standard was not just that it defined the unit of account, but that it operated throughout almost the entire world. A price in England was the same as a price in Australia or any other country.

Today we can determine price differences between countries by **considering** the exchange rate of the day.

The great advantage of having a single stable world money is that such money has very high information content. It tells people where to invest their time, energy and capital, all around the world, with much greater accuracy and predictability than would otherwise be possible.

Nowadays many specialists believe that within the next decade money, as we know it will probably **cease** to exist in technologically advanced countries. The familiar coins and notes will soon be replaced entirely by plastic money — plastic cards of various kinds. And the shops of the future will be linked directly to the network of banking computers. The shop assistant will simply key in your **bank account** code number and the amount you have spent, and thank you politely.

Banks have invested huge amounts of money in new technology. Credit cards are issued by credit card companies such as Visa and MasterCard. These companies work closely with all the major banks. A credit card enables you to pay for goods or services immediately without **cash** or cheque. You are given free credit for an agreed period. At the end of this period you are charged high interest. Every credit card holder is given a credit limit.

Most banks provide their customers with banker's cards. Using PIN (personal identification number) you can use this card to **withdraw** cash from the ATMs (Automated Teller Machines).

Some banks have already introduced «first generation» smart cards. A smart card contains a computer «chip». It can do all the things other cards can do but it can also store and display each transaction. In the near future you may be using these cards for «home shopping», satellite TV, telephone charges, and as passports and identity cards.

В. Подберите к каждому слову и словосочетанию из колонки А соответствующее ему по значению из колонки В.

A	B
1. unit of account	a. take into account
2. bank account	b. take out money from the bank
3. value	c. money in coin or notes

4. grains	d. keeping one's money at a bank
5. print	e. stop, come to an end
6. consider	f. unit of counting
7. cease	g. worth of smth.
8. cash	h. tiny, hard pieces
9. withdraw	i. make books, pictures, etc.

Упражнение 7. Заполните пропуски терминами, переведите.

1. ... is money that may be used to start a business.
2. ... is the type of money used in a country.
3. ... is money in coin or notes.
4. ... are metal money, ... is system of coins in use.
5. ... are paper money.
6. ... money is different kinds of plastic cards.
7. ... is to be worth in terms of money.
8. ... is price asked for goods or services.
9. To ... means to ask smb. to pay.
10. To ... money means to keep some of one's money, e.g., for a new computer.
11. To ... money means to use it badly on things that one does not need.
12. The ... of living means how much people pay for things.
13. ... of living is the level of money and comfort people have.

Упражнение 8. Заполните пропуски синонимами или антонимами.

value	...	waste	...
...	condition	...	lend
quantity	...	cheap	...
...	common, often see or heard	...	unstable
various	...	minor	...

Упражнение 9. А. Назовите 20–25 ключевых слов и словосочетаний на тему: «Business and finance».

В. Speak about:

1. The state of the economy at the moment. Is it strong or is it in recession?
2. The current rate of inflation in the country. Has the government reduced company taxes or personal taxes lately? Has public expenditure risen or fallen recently?
3. New technology and money.

Text 3

Какое значение имеют электронные средства связи в современной организации производства?

А. Прочитайте текст и постарайтесь догадаться о значении в данном контексте слов: *vital, corporate, compile, memo, pace, respond, intranet, empower*.

Paperwork and the Digital Nervous System

Bill Gates states it did not take Microsoft Co. long to get rid of most of the company's paper forms. The move from paper to electronic forms is a **vital** step in the evolution of a modern organization's nervous system. A **corporate** system defines how an organization deals with planned and unplanned events alike. It includes meetings, paperwork and electronic systems. It governs the way information about customers is stored, the way workers are organized, the way budgets are **compiled** and activities are coordinated, and the way information is exchanged.

In the past, companies were virtually alike in terms of how they managed these activities. Meetings, **memos** and managers were relied upon heavily. The **pace** was not usually too fast, and there was lots of paper.

But one of the lessons from Darwin is that the excellence of an organism's nervous system helps determine its ability to sense change and quickly **respond**, thereby surviving or even thriving.

Today, new «digital nervous systems» are based on electronic communications tools that help corporations maintain themselves, defend from dangers and take advantage of opportunities rapidly. The Internet and **intranets** are essential.

You can easily bring the people you need together electronically, even if they are all over the globe. The people in the company can gain a common understanding of what is going on. They can exchange ideas easily.

Perhaps the single most important element of a digital nervous system is a customer database. Having all your information about customers in one place gives you the tools to analyze and make decisions. It **empowers** you to be highly responsive to customers needs.

Microsoft's system is far from perfect, but it improves as the company takes better advantage of technology. Its annual budgeting process used to take three months. Microsoft invented a new process around electronic forms on the company's intranet.

The budget cycle is now a very tense three-week period. The company's digital system lets everybody see immediately what the other people in the company are planning. The managers see comparisons of sales and expense forecasts relative to market size in other divisions and regions. The product groups see the numbers organized by product. The subsidiaries see the numbers geographically. The finance people see them in on a profit-and-loss basis.

In other words, information can automatically be analyzed and compared and summarized and brought to the attention of the people who need to know about it.

В. Подберите к каждому слову или словосочетанию в колонке А соответствующее по значению из колонки В.

A	B
1. take smb. to do smth.	a. use for one's own benefit
2. get rid of	b. be successful, prosper
3. vital	c. act in answer to
4. corporate	d. necessary for living
5. do alike	e. need, require
6. compile	f. give power to act
7. be alike	g. in the same way
8. memo	h. be similar
9. pace	i. controlled by a larger company
10. respond	j. collect (information) and arrange it in a list
11. thrive	k. note for future use
12. empower	l. belonging to a corporation or group
13. take advantage	m. become free of
14. subsidiary	n. move at an unhurried rate

С. Заполните пропуски синонимами.

control	...	at once	...
...	feel, realize	...	excellent
virtually	...	most important	...
...	determine	...	similar
allow	...	protect	...

Д. Составьте возможные словосочетания из глаголов в колонке А и существительных из колонки В:

A	B
1. compile	a. information
2. take	b. understanding
3. manage / organize	c. decisions

4. store / exchange / analyze	d. ideas
5. make	e. workers, activities
6. gain	f. advantage
7. exchange	g. a budget

Е. Составьте возможные словосочетания прилагательных из колонки А и существительных из колонки В.

А	В
1. annual	a. forms
2. vital	b. budget
3. digital	c. understanding
4. common	d. communications tools
5. electronic	e. step
6. paper and electronic	f. system

Е. Заполните пропуски, образуя составные слова, общеизвестные словосочетания или термины. Запомните их.

profit and ...	market ...
three-week ...	... group
... forecast	paper ...
expense ...	... people

Упражнение 1. А. Назовите 10–15 ключевых слов и словосочетаний на тему «Electronic communication tools».

В. Speak about:

The role and importance of electronic communications tools in a modern company organization.

Text 4

Что такое логистика? Каковы последние направления в этой области?

А. Прочитайте текст и постарайтесь догадаться о значении следующих слов: *retrieve, storage, package of services, to contract, totality*.

Flexible Logistics Systems

Several organisations are expanding beyond their national borders as a strategy to improve competitiveness and their ability to offer diverse products to an expanded market. Many companies have become very proficient at supplying products throughout the world. The task requires not only the ability to recognize opportunities, but also an information system to co-ordinate the supply of goods

and materials to places where they are needed throughout the world.

Logistics is supply, distribution and replacement of materials, goods and personnel. It is a problem for all organisations, both public and private. For instance, there were tremendous logistics challenges of moving the US military — army, navy, and air force — to carry out the military operations called «Desert Storm», problems which were even more complex when other nations belonging to the United Nations assisted with the operations. Large logistical problems are faced by relief agencies which are trying to give public assistance to people during emergencies.

In a small warehouse, improvements can be obtained from better information systems, productivity improvements, inventory (инвентаризация) savings, reductions in returns (возврат, оборот, прибыль), space saving (10–30 per cent), and extra customer service profit. That is, for a warehouse of 80,000 sq. ft, 50 staff, and \$100 million sales per annum, and inventory of \$40 million, it is possible to save over \$2 million per annum from improved methods. The costs of such improvements can be **retrieved** after just three months.

The logistics aspects of the distribution chain (цепочка) in any organisation relate to the use of information to manage more effectively the functions of transportation, **storage**, warehousing, and freight forwarding (пересылка груза). The information system has to co-ordinate a distribution network which consists of transportation services between suppliers to factories, factories to storage facilities, ports and warehouses, storage services in the warehouses, transportation services between the warehouses and buyers and linkages between countries. As a result of implementing an efficient information system and computer network, McDonald's restaurants are able to receive food products from various suppliers, re-package them to meet McDonald's specifications, and then deliver them to their restaurants throughout the world, and still maintain consistent (соответствующие) standards.

Some companies perform logistics services themselves, but many are **contracting** these services to specialists who have information systems to offer a **package of services** — from simple storage and warehousing to a total package or complete service which might include consolidation (объединение) of cargo, transportation, storage and inventory management. Companies within the logistics sector distinguish themselves by the **totality** of the services they offer. Generally, smaller firms may have less sophisticated

information systems and may only provide services such as warehousing and transportation. Large firms have the resources and economies of larger scale to develop more sophisticated information and computer systems. However, developing a sophisticated and centralized information and mechanized warehouse may not necessary lead to a success.

Certain larger companies choose to rely on more flexible systems, which allow for learning and adaptation.

В. Подберите к словам в колонке А синонимы или близкие по значению слова из колонки В.

A	B
1. complex	a. tremendous
2. total	b. of different kind
3. diverse	c. sophisticated
4. keep up	d. assistance
5. profit	e. maintain
6. very great, enormous	f. returns
7. help	g. entirety
8. totality	h. complete

С. Найдите в тексте слова, означающие:

1. help given to those in need and trouble
2. skilled, expert
3. get back, return quickly
4. spread out over a large area
5. a problem, difficulty
6. serious situation, needing action as soon as possible
7. a/per year
8. a building for storing goods before distribution
9. easily changed, adaptable for new needs or conditions

Д. Заполните пропуски словами:

management	logistics	distribution	inventory	storage	returns
transported	warehouse				

1. We know (1) ... to be a detailed list of goods, parts, equipment, etc. 2. Small profits and quick (2) ... is the motto (девиз) for shops that rely on large sales and quick turnover. 3. In the same way, Toshiba might contract with a (3) ... firm so that television sets and other products could be picked up from the factory, taken

to a (4) ... , perhaps repackaged, and then (5) ... to stores in other countries. 4. Many companies are interested in improving customer service through better inventory (6) ... 5. As a rule, an unproductive (7) ... chain results in a higher total inventory cost. 6. NAVAIR wants logistics data to be converted to digital form for storage in a «virtual» (8) ... facility — a single set of consolidated databases that could be accessed by sailors aboard ship, support engineers at shore and program managers.

Упражнение 1. А. Назовите 15–20 ключевых слов и словосочетаний на тему «Logistics».

В. Speak about:

Problems logistics deals with.

SUPPLEMENTARY TEXTS

To be read after Text 1

Finding Opportunity in the Global Economy

Bill Gates says today if you had to guess (угадать) somebody's approximate income (i.e., money you receive) and you were limited to asking one polite question, a good one would be: «What country do you live in?» That is because of the huge difference in average wages (weekly payment for work) from country to country. But a generation from now, if you want to guess someone's income, a more-telling single question might be: «What's your education?» «This, at least, is my belief», B. Gates says. Future business opportunity will depend on educational opportunity — for everyone.

Compared to almost anything else in a developed society, the cost of investment in education is low — and the returns are high. Even the poorest of countries can develop better schools. Education is essential because electronic networks and software-driven technologies are beginning to break down the economic barriers between nations. The Internet and the availability of inexpensive, powerful computers are helping spread opportunity to developing nations.

International communication, which is certain to become extraordinary¹ cheap in all its forms, will bring suitably educated people from every economic region into the mainstream of the world economy. Well-educated, enterprising individuals with access to information technology will do well no matter where they live.

Nearly a billion people in rural China may find their lives little changed for decades, but tens of millions of the best-educated Chinese could earn more or less what similarly educated people in the United States or Germany do.

As technology breaks down the barriers of distance and national borders, it will be even more important that everybody be given equal educational opportunities. Eventually, being «poor» won't be much a matter of living in a poor country as it will be a matter of having poor skills.

Assuming you want to develop those skills, what should you study? There are a lot of opportunities in the knowledge-based global economy, and B. Gates is particularly enthusiastic about the business he knows best — software.

Because software is an almost pure expression of logic, the industry is a great field for almost anyone today. Just about every technical and scientific discipline will apply. The business side is equally exciting and challenging² because the industry is so dynamic. And software jobs are among the highest-paid. It is not a win-lose industry, either. More software development in one region does not mean reduced software development in another. Rather, software development as a whole helps to grow the world economy.

The value and importance of the software industry — and its employees — will continue to grow indefinitely. Software is transforming the workplace in industry after industry, increasing productivity and helping globalize the world economy.

Notes to the Text

1. unusually
2. interesting and difficult

To be read after Text 2, 3, 4

Ten Attributes of a Good Employee

Here are 10 of the qualities Bill Gates finds in the «best and brightest» employees the companies should attract and retain.

First, it is important to have a fundamental curiosity¹ about the product of your company or group. You have to use the product yourself.

Second, you need a genuine (настоящий, подлинный) interest in discussion with customers about how they use your product,

what they like or don't like in order to know where your company's product could be better.

Third, once you understand your customer's needs, you have to enjoy thinking through how this product can make work more interesting.

These first three points are related. Success comes from understanding and caring deeply about your products, your technology and your customers' needs.

Fourth, you as an individual employee should develop your own skills and those of the people you work with. If maximizing your next bonus² or salary increase is all that motivates you, you are likely to lose an opportunity to benefit from teamwork³ that creates success in the long term.

Fifth, you need to have specialized knowledge or skills while maintaining a broad perspective. Big companies, in particular, need employees who can learn specialties⁴ quickly, so a willingness to learn is critical.

Sixth, you have to be flexible enough to take advantage of opportunities that can give you perspective. At Microsoft Co., they try to offer a person lots of different jobs in the course of a career. Anyone interested in joining management is encouraged (поощрять) to work in different customer units, even if it means moving within the organization or relocating to a different part of the world. Microsoft Co. has many employees working for their US subsidiaries in other countries. This helps them better understand world markets.

Seventh, a good employee will want to learn the economics of the business. Why does the company do what it does? What are its business models? How does it make money? And a company, in turn, should educate its employees in the fundamental financial realities of its industry.

Eighth, you must focus on competitors, i.e., you must think about what is going on in the marketplace. What are your company's competitors doing that is smart⁵? What can we learn from them? How can we avoid their mistakes?

Ninth, you've got to use your head. Analyze problems to understand the implications (скрытый смысл, последствия) of potential tradeoffs⁶ of all kinds, including the tradeoff between acting sooner with less information and later with more. Use your head in practical ways. Prioritize your time effectively.

Finally, don't fail to see the obvious essentials, such as being honest, ethical⁷ and hard working. These attributes are critical and go without saying.

Notes to the Text

1. strong desire to learn / know about smth.
2. addition to usual payment
3. combined effort
4. special activities, operations, products, etc.
5. skillful, clever (=quick in learning and understanding things)
6. compromise, compromising decision, choice
7. of moral principles

ТЕРМИНОЛОГИЧЕСКИЙ СЛОВАРЬ

А

annum — per annum [pəɹ'ænəm] *в год*

asset ['æset] *н имущество; активы баланса*

В

balance ['bæləns] *н account ~ баланс счета*

belief [br'li:f] *н вера; мнение, убеждение*

bid [bɪd] *н предложение цены (на аукционе)*

bidding ['bɪdɪŋ] *н предложение цены*

bill [bɪl] *н счет, расходы*

bonus ['bəʊnəs] *н премия, вознаграждение*

buyer ['baɪə] *н покупатель*

С

card [kɑ:d] *н карточка; identity удостоверение личности; credit кредитная карточка; smart многофункциональная платежная карточка, чиповая карточка*

cash [kæʃ] *н наличные деньги*

challenge ['tʃælɪndʒ] *н сложная задача; проблема; v ставить задачу, сталкиваться с трудностями*

challenging *а сложный, многообещающий, перспективный*

charge [tʃɑ:ʒ] *в назначать, запрашивать цену; взимать плату*

cheque [tʃek] *н чек*

coin [kɔɪn] *н монета*

coinage ['kɔɪnɪdʒ] *н монетная система; чеканка монет*

commerce ['kɒməs] *н торговля (оптовая); коммерция*

competitor [kəm'petɪtə] *н конкурент; участник рынка*

compile [kəm'paɪl] *в составлять (бюджет); собирать материалы, факты*

consumer [kən'sju:mə] *н потребитель*

contract ['kɒntrækt] *в заключать договор, сделку, соглашение*

corporate ['kɔ:pəɪt] *а корпоративный, групповой*

curiosity [kjʊərɪ'ɒsɪtɪ] *н любопытство, любознательность*

currency ['kʌrənsɪ] *н валюта*

customer ['kʌstəmə] *н покупатель, заказчик, клиент*

D

demand [dɪ'mɑ:nd] *n* спрос
distribution [ˌdɪstrɪ'bju:ʃən] *n* сбыт, реализация
diverse [daɪ'vɜ:s] *a* различный, разнообразный
division [dɪ'vɪzən] *n* подразделение

E

earn [ə:n] *v* зарабатывать
emergency [ɪ'mɜ:ʤənsɪ] *n* чрезвычайные обстоятельства
employee [ˌemplɔɪ'ɪ] *n* служащий; рабочий; работающий по найму
empower [ɪm'paʊə] *v* давать право, возможность
encourage [ɪn'klɜɪʤ] *v* поощрять
enterprising ['entəpraɪzɪŋ] *a* предприимчивый
ethical ['eθɪkəl] *a* нравственный, этичный
expenditure [ɪks'pendɪtʃə] *n* расходы, затраты
expense [ɪks'pens] *n* расходы, издержки; **at the ~ of** за счет
extraordinary [ɪks'trɔ:dnri] *a* необычный, чрезвычайный

F

fee [fi:] *n* вознаграждение, гонорар; взнос, сбор
forecast ['fɔ:kɑ:st] *n* прогноз, предсказание
funds [fʌndz] *n* средства, фонды (*денежные*)

G

gain [geɪn] *v* получать, приобретать, добиться

H

handle ['hændl] *v* управлять; иметь дело с

holder ['həʊldə] *n* владелец; **credit card** владелец кредитной карточки

I

income ['ɪnkʌm] *n* доход
insurance [ɪn'ʃʊərəns] *n* страхование
interest ['ɪntrɪst] *n* процент
intranet [ɪn'trænət] *n* внутренняя связь
inventory ['ɪnvəntri] *n* инвентаризация; наличные товары (запасы)
investment [ɪn'vestmənt] *n* капиталовложение, инвестиция, вклад
invest *v* вкладывать, делать инвестиции
issue ['ɪʃu:]['ɪsju] *v* выпускать в обращение

K

key [ki:] *v* нажимать кнопку; **~in** набирать

L

limit ['lɪmɪt] *n* **credit** предельный размер кредита
loan [ləʊn] *n* заем, ссуда
logistics [ləʊ'dʒɪstɪks] *n* логистика

M

maintain [meɪn'teɪn] *v* сохранять, поддерживать
manage ['mænɪʤ] *v* управлять, руководить; **money** управлять деньгами, управлять финансами
market ['mɑ:kɪt] *n* рынок, сбыт, продажа
marketing ['mɑ:kɪtɪŋ] *n* торговля; предметы торговли; сбыт, продажа
memo ['mi:məʊ] *n* меморандум; служебная записка, памятная записка

N

network ['netwə:k] *n* сеть

number ['nʌmbə] *n* **personal identification** идентификационный номер

O

order ['ɔ:də] *n* заказ; распоряжение

overheads [əʊvə'hedz] *n* накладные расходы

P

pace [peɪs] *n* скорость, темп

package ['pækɪdʒ] *n* пакет; **of services** пакет услуг

payment ['peɪmənt] *n* оплата, платежи, выплата

personnel [ˌpɜ:sə'nel] *n* персонал, кадры

price [praɪs] *n* цена; **retail** розничная цена; **wholesale** оптовая цена

productivity [ˌprɒdʌk'tɪvɪtɪ] *n* производительность

proficient [prə'fɪʃənt] *a* опытный, умелый

profit ['prɒfɪt] *n* прибыль, доход

promotion [prə'məʊʃən] *n* содействие в продаже; продвижение, повышение в должности

prosper ['prɒspə] *v* преуспевать

purchase ['pɜ:tʃəs] *n* покупка; *v* покупать

R

raise [reɪz] *v* поднимать; *n* повышение

relief [rɪ'li:f] *n* помощь; пособие; скидки (*с налога*)

respond [rɪs'pɒnd] *v* отвечать, реагировать

retrieve [rɪ'tri:v] *v* отыскать (*информацию*); вернуть, восстановить

return [rɪ'tə:n] *n* возврат оборота, прибыль; **tax** налоговая декларация

S

salary ['sæləri] *n* зарплата (*служащему*)

sales [seɪlz] *n* продажа, реализация, сбыт; **representative** агент по продаже; **target** намеченная цифра; цель; количество продаж **salesman** *n* коммивояжер

save [seɪv] *v* экономить, сберегать

saving *n* экономия

savings *n* сбережения

seller ['selə] *n* продавец

share [ʃə] *n* доля, часть; участие; акция; **market** долевое участие на рынке в процентах

specialty ['speʃəltɪ] *n* особенность, отличительная черта, отличие (*специализация*)

staff [stɑ:f] *n* состав (*служащих*); штат, персонал

state [steɪt] *v* заявлять, сообщать **storage** ['stɔ:ɹɪdʒ] *n* хранение; склад

streamline ['stri:mlaɪn] *v* ускорять, модернизировать

subsidiary [səb'sɪdjəri] *n* филиал; дочерняя подконтрольная компания

supply [sə'plaɪ] *n* снабжение, поставка; **and demand** спрос и предложение

supplier [sə'plaɪə] *n* поставщик

T

teller ['telə] *n* кассир, счетчик; ~ **machine** банкомат

tense [tens] *a* напряженный

thrive [θraɪv] (*throve, thriven*) *v* процветать, преуспевать

totality [təu'tælɪtɪ] *n* все количество, вся сумма целиком

tradeoff ['treɪdɒf] *n* сравнительная оценка; принятие компромиссных решений

transaction [træn'zækʃən] *n* дело, сделка, операция (*торговая, банковская*)

turnover ['tɜ:n,əʊvə] *n* оборот, товарооборот

U

unit ['ju:nɪt] *n* единица; **of account** расчетная денежная единица

V

value ['vælju:] *n* стоимость, цена

vital ['vaɪtl] *a* жизненно важный, крайне необходимый

W

wages ['weɪdʒəz] *n* заработная плата (*рабочих*)

warehouse ['wɛəhaʊs] *n* склад; *v* помещать на склад, хранить на складе

warehousing *n* складское хозяйство, складирование

withdraw [wɪð'drɔ:] *v* изымать из банкомата; забирать деньги из банка

Y

yield [ji:ld] *n* процентный доход

ДОПОЛНИТЕЛЬНЫЕ МАТЕРИАЛЫ ДЛЯ СПЕЦИАЛЬНОСТИ «ЮРИСПРУДЕНЦИЯ»

Text 1

Что Вы понимаете под словом «закон»? Прочитайте и переведите текст.

What Is Law?

The word «law» refers to limits upon various forms of behaviour. In all societies, relations between people are regulated by prescriptive laws, laws which prescribe how people ought to behave. For example, the speed limits are laws that prescribe how fast drivers should drive. Some of such laws are customs, that is, informal rules of social and moral behaviour. And some of them are precise laws made by individual nations, governments and **enforced** against all citizens within their power.

The purpose of government-made laws is social control (without laws there would be anarchy in society) and the implementation of justice. Sometimes laws are simply an attempt to implement common sense. It is obvious to most people that dangerous driving should be punished. But in order to be enforced, common sense needs to be defined in law.

The laws made by the government of one country are often very different from the laws of another country. But the law today is, to a large extent, a complex of different and relatively independent national systems. Despite major revisions over the centuries, the legal system of England and Wales is one of the oldest still operating in the modern world. English law has directly influenced the law of former British colonies such as Australia, India, Canada and the nation where law plays a bigger part in everyday life than anywhere else, the United States. In addition, although the legal systems of Western Europe and Japan come from rather different traditions, there are enough similarities in principle and institution.

Each country in the world, even each state of the United States, has its own system of law. But it should be said that there are two main traditions of law in the world. One is based on **English Common Law**, and has been adopted by many Commonwealth countries and most of the United States. The other tradition, sometimes known as **Continental**, or **Roman law**, has developed in most of

continental Europe, Latin America and Africa which have been strongly influenced by Europe. Continental law has also influenced Japan's legal system. In these countries Continental systems have resulted from attempts by governments to produce a set of precise, detailed codes to govern every legal aspect of a citizen's life.

Text 2

Какие слова и термины из области правопорядка и преступлений Вы знаете? Прочитайте и переведите текст.

Law, Order, Crime

When somebody **breaks the law** and does something **against the law** the police must **investigate** who is responsible for a crime. If they find the person who committed the crime, they arrest him or her. At the police station the person is **questioned** and **charged** with the crime. He must then be sent to **court** for **trial**.

The person charged with the crime is now called the **defendant** or **accused**. In court, he must try to prove that he is innocent. The jury listens to all the **evidence** for and against the defendant and then makes their decision.

If the jury decides that the defendant is **guilty**, the **judge** will give the **sentence**. For example, if a person is **convicted of murder**, the sentence will be many years **in prison**. The person then becomes a **prisoner** and the place he lives in is called a **cell**. For **minor offences** (that is, crime that is not serious, e.g. illegal parking), the **punishment** is usually a **fine**. To **fight crime** the courts now give **tougher punishments** for crimes committed than in the past (e.g. bigger fines or longer prison sentences). There is **capital punishment** (death by electric chair or hanging) for some crimes. If a person convicted of a crime is put on **probation**, instead of punishment, he must behave well for a period of 1—3 years. If he is convicted of another crime while on probation, he will also be punished for the original crime. **Suspended sentence**¹ is a prison sentence of less than two years which does not take effect unless the convicted person commits another crime during the period specified by the court. **Corporal punishment** consists of causing a person to physical pain, e.g. by whipping. A **community service order**² is a court order to a person convicted of a crime to do a certain number of hours of work without pay in the local community instead of another form of punishment.

Common offences like **theft, robbery, burglary, shoplifting**; more serious offences such as **murder, manslaughter** and **rape**, crimes against public morals, pollution and traffic offences are aris-

ing every day in the courts. Thief, robber, burglar, shoplifter, murderer, rapist are **criminals**.

People who **defend** criminals and present evidence are called **barristers (lawyers)** or **attorneys** (in Am Eng).

Notes to the Text

1. Suspended sentence — отсрочка исполнения приговора или наказания

2. community service order — направление на общественные работы

Упражнение 1. Поставьте следующие события в правильной последовательности.

1. You are convicted of an offence.
2. You are sentenced to punishment for an offence.
3. You are tried for an offence.
4. You are suspected of an offence.
5. You plead guilty or not guilty to an offence at the trial.
6. You are arrested for an offence.
7. You are accused of an offence (You are charged with an offence).

Упражнение 2. Заполните пропуски.

1. The ... must decide if the accused is innocent or ...
2. The police were sure the man was a ... , but it would be difficult to ... it in court.
3. Two months later the defendant was sent to court for ...
4. If the accused is convicted of rape, the ... may be at least ten years in ...
5. ... defend people and present ...
6. If you park your car illegally, you will have to pay a ...
7. In Britain it is ... the law to drive a motor vehicle without insurance.
8. Fortunately, it was only a minor ... and we were not taken to the police station.
9. The ... sentences people.
10. I have never ... the law and ... a crime.
11. Police are allowed to stop anyone in the street and ... them.

Упражнение 3. Подберите к словам и словосочетаниям в колонке А соответствующие по значению из колонки В.

A

1. wrong
2. ask questions
3. commit a crime
4. arrest
5. evidence

B

- a. punishment
- b. provide facts
- c. kill someone by intention
- d. question
- e. investigate

6. sentence	f. kill someone by accident
7. theft	g. break into a shop / house
8. rob	h. take to the police station
9. burgle	i. steal from a shop when open
10. steal	j. steal from people or places
11. shoplift	k. break the law
12. murder	l. illegal, against the law
13. manslaughter	m. information about the crime
14. capital punishment	n. stealing
15. try to find out what happened	o. take
16. prove	p. death sentence

Упражнение 4. Заполните пропуски.

1. We think the driver of a BMW will be charged with ... because he did not mean to kill the boy. 2. Did he kill his partner? Yes, he has been charged with ... 3. He took the money from women's bags. He has been charged with ... 4. She stole things from a supermarket, so she will be charged with ... 5. Two boys have been charged with ... because they broke into a shop in the middle of the night and took money.

Упражнение 5. Замените выделенные слова и словосочетания близкими по значению словами или словосочетаниями.

1. If someone commits a crime, the police must **try to find out what happened**. 2. When the police find the persons responsible for the crime they **take them to the police station** and **ask them** a lot of **questions**. 3. To reach their decision, the jury must listen carefully to the **information about the crime for and against the accused**. 4. It was only a minor offence and a driver had to pay **money**. 5. If you do something **wrong**, then you commit a crime. 6. **Death sentence** is a comparatively rare event now. 7. What can government do to **stop** crime?

Упражнение 6. Составьте словосочетания глаголов из колонки А и существительных из колонки В.

А	В
1. make	a. the sentence
2. commit	b. of the crime
3. break	c. against the law
4. give	d. the law
5. listen to	e. decisions

6. be charged	f. the evidence
7. be convicted	g. with the crime
8. do smth.	h. a crime

Упражнение 7. Заполните пропуски антонимами.

guilty ...	lawful ...
... illegal	... usual, common
minor ...	right ...

Упражнение 8. Заполните таблицу на словообразование.

Verb	Noun	Verb	Noun
... accuse ...	conviction ... question	punish ... sentence	... commitment ...

Упражнение 9. А. Назовите 20–25 ключевых слов и словосочетаний на тему «Law and order, crime».

В. Speak about:

- Individual actions necessary to prevent a crime from happening (to stop a crime).
- Capital punishment for some crimes.
- Do you think people should be allowed to use a gun or knife in self-defence?

Text 3

Какие виды права вы знаете? Прочитайте и переведите текст.

The law is the whole body of laws considered collectively. There are many ways in which the law can be classified. It can be divided into **common law, civil law, criminal law, constitutional law, substantive and procedural laws**, etc.

By the words «**common law**» we mean law which is common to the whole country — national law in contrast to local law. Common law (in England) is unwritten law based on judicial decisions made by judges in previous cases (**case law**) in contrast to the law made by Parliament or other law-making body (**statute law**). It distinguishes the common law legal systems based on precedents from the civil law **jurisdictions** based on **civil codes**. **Law of equity** is the application of principles of **justice** outside common law or statute

law, used to correct laws when these would apply unfairly in special circumstances.

A simple distinction between **the criminal law** (the foundation of which is the common law), and **the civil law** is that the latter regulates the relationships between individuals or bodies and the former regulates the legal relationships between the state and individual people and bodies. Examples of the civil law include breaches of contract (**the law of contract**), **tort** (literally meaning «wrong»), **property** or **claims for damages for negligent conduct**. Consider the following situation. You decide to buy a cellphone from a local shop. You pay the correct price and take the cellphone away. You have entered into a contract with the owner of the shop. After three days the cellphone fails to work. This is a common situation and usually the shopkeeper will replace the cellphone or return your money. If not, you may wish to take **legal action** to recover your loss. As the law of contract is part of the civil law **the parties** to the action will be you (an individual) and the owner of the shop (an individual person or body). Hence, the civil law is more concerned with apportioning losses than determining blame. Given that the defendant has damaged the **victim's property**, the question in the civil law is who should pay for that damage. If the victim is wholly innocent and the defendant even only little **to blame**, then the defendant should **shoulder the liability**.

Now let us look at some examples of the criminal law. This is the law by which the state regulates the conduct of its citizens. Criminal offences range from the petty (e.g. parking offences) to the very serious (e.g. murder). Look at the following situation. You are driving your car at 70 m.p.h. (112 kilometers per hour) in an area, which has a speed limit of 40 m.p.h. You are stopped by a police officer and subsequently **a case** is brought against you for dangerous driving. This is a criminal offence. The parties to the action will therefore be the state (in the form of **prosecuting authority**) and you (an individual).

Although the division between the civil and criminal law is clear, there are many actions, which will constitute a criminal offence and a civil wrong. For example, you are driving your car too fast. Suppose that while you were doing this you knocked over and injured an elderly man. You will have committed a criminal offence (dangerous driving) and a civil wrong (negligence). The legal consequences under the criminal and civil law will be different. You would be prosecuted by the state in the criminal courts for dangerous driving and sued by the elderly man in the civil courts for **negligence**. The two actions will be totally separate.

The law of contract and the criminal law are two areas of substantive law. «**Substantive law** lays down people’s rights, duties, liberties and powers». By this is meant the actual content or substance of the law. These are the rules on which the courts base their decisions.

Procedural law is also a set of rules. Rules of procedure are the rules, which govern such matters as how the case is to be presented, in what court it shall lie, or when it is to be tried. Procedural rules are, in other words, the rules, which govern the machinery as opposed to the subject-matter. It is a striking fact that in the earlier stages of legal development these rules assume paramount importance: form is better understood than substance, and formal requirements, rather than abstract principles, usually determined legal rights. However, the rules of procedure are now more flexible than once they were.

Упражнение 1. Прочитайте определения юридических терминов. Дайте русские эквиваленты выделенным словам и словосочетаниям. Переведите предложения.

1. The person charged with the **criminal offence** is the defendant. 2. A criminal case is brought by a **prosecutor**. 3. A successful criminal **prosecution** will result in a **conviction**. 4. The word «**guilty**» is used primarily of criminals. The corresponding word in civil cases is «**liable**», but this word is also used in criminal contexts. 5. The party bringing a civil action is the **plaintiff**. 6. The **party** is one of the persons or sides in a legal agreement or dispute. 7. The defendant in a civil case is **sued** by the plaintiff. 8. If the plaintiff is successful, the defendant will **be found liable**. 9. The distinction between crimes and civil wrongs relates to the **legal consequences**. 10. A court order not to do something is an **injunction**. 11. **Judgment** is the decision of a judge or court. 12. **Procedure** is the regular order of doing legal things. 13. A **proceeding** is a course of action. 14. **Damages** are money given as legal compensation. 15. **To sue** is to take legal action against someone in a civil case.

Упражнение 2. Заполните пропуски следующими словами:

judgment	prosecutor	conviction	plaintiff	sues	prosecution
punishment	injunction	punished			

1. In criminal proceedings a (1) ... prosecutes a defendant.
2. The result of the (2) ... if successful is a (3) ... 3. And the defendant may be (4) ... by one of a variety of punishments ranging from

life imprisonment to a fine or else may be released or discharged without (5) ... 4. In civil proceedings a plaintiff (6) ... (e.g. brings an action against) a defendant. 5. The proceedings if successful result in judgment for the plaintiff, and the (7) ... may order the defendant to pay the (8) ... money, or transfer property to him, or to do or not to do something [(9) ...], or to perform a contract.

Упражнение 3. Заполните пропуски, разместив следующие слова и словосочетания в соответствующую колонку:

crime, life imprisonment, to convict, civil wrong, guilty, plaintiff, defendant, to prosecute, liable, to punish, prosecution, conviction, judgment for the plaintiff, prosecutor, offence, punishment

Civil	Criminal
...	...
...	...

Упражнение 4. Составьте словосочетания глаголов из колонки А и существительных из колонки В.

A	B
1. bring	a. the prosecution
2. conduct	b. a criminal
3. investigate	c. blame/right
4. commit/charge with	d. the evidence
5. punish	e. a case/an action/a prosecution
6. determine	f. legal proceedings
7. give/hear	g. a case/a crime
8. take/start	h. an offence

Упражнение 5. Подберите к словам из колонки А синонимы или близкие по значению слова и словосочетания из колонки В.

A	B
1. liable	a. most important/ greatest
2. damage	b. take the responsibility for
3. tort	c. allowed by law
4. code	d. behaviour (moral)
5. legal	e. pay no attention to/ fail to do smth.
6. distinction	f. carelessness
7. neglect	g. for this reason
8. negligence	h. civil wrong/ not (generally) a crime
9. breach	i. money paid in compensation
10. paramount	j. difference
11. petty	k. responsible for

12. crime
13. hence
14. conduct
15. shoulder
16. apportion

1. a system of laws
m. breaking (an agreement/ duty)
n. offence
o. divide/ distribute
p. small

Упражнение 6. Заполните пропуски антонимами.

petty	...	written	...
...	unjust	...	injustice
legal	...	national	...
...	misconduct	...	unlawful
case	law ...	based on precedent	...
...	discharge	...	release from prison
carefulness	...	fair	...

Упражнение 7. Заполните таблицу на словообразование.

Verb	Noun	Adjective
neglect	...	...
...	...	prosecutive
separate	...	...
...	legalization	...
justify	...	...
...	...	punishable
constitute	...	...
...	...	blameless

Упражнение 8. А. Назовите 20–25 ключевых слов и словосочетаний на тему «Branches of the law».

В. Speak about:

Distinctions between the criminal law and the civil law. Give your own examples of both of them.

Text 4

Какие судебные институты исполняют закон? Прочитайте и переведите текст.

Judicial Institutions (Courts)

In all legal systems there are institutions for creating, modifying, abolishing and applying the law. Usually these take the form of

a **hierarchy of courts**. The role of each court and its capacity to make decisions is strictly defined in relation to the courts. There are two main reasons for having a variety of courts. One is that a particular court can specialize in a particular kind of legal action. The other is so that a person who feels his case was not fairly treated in a lower court can appeal to a higher court for **reassessment**. The decisions of a higher court are binding upon lower courts. At the top of the hierarchy is a supreme law-making body.

The court in which a case is first heard is called the court of **first instance**. **Appellate courts** (or **Appeal Courts**) are civil or crime courts to which a person may go for a reconsideration of the decision of the original court.

The formal courts are not the only means of solving disputes; **adjudication** increasingly takes place outside the court system. The two main forms of extra-court adjudication are **tribunals** and **arbitration**. Tribunals were established to adjudicate on disputes arising out of social **legislation** which regulates such areas as employment, housing and social security benefits.

The disputes in these areas might be settled by ordinary courts but the ordinary courts lack the necessary expertise or are too formal, slow and costly. Hence, the legislation has established a tribunal to do the job. There are numerous types of tribunals, each with its own limited jurisdiction over a particular type of claim. Many tribunals have **expert assessors**¹ sitting along a legally experienced chairman to make up the **judging panel**². From the point of view of the ordinary citizens they are the most important courts in the country but from the point of view of lawyers they are perhaps the least important element in the court system of England.

In contrast, arbitration is a private means of adjudication, arranged and agreed between parties involved. Here the parties agree to place their dispute in the hands of an independent third party and **invest the arbitrator with the power** to decide the issue. The arbitrator is likely to be someone with expertise in the area. The purpose of arbitration is to enable people to have small disputes resolved in an informal atmosphere, avoiding as far as possible the strict rules of procedure usually associated with court proceedings. This does not mean that rules are not observed because the object of all court procedures is to protect the interests of each party to the action and to ensure that the case is tried fairly. Nevertheless, the formalities are kept to the minimum.

The advantages of arbitration are similar to those of tribunals: speed, lower costs, flexibility, informality and adjudication by an expert. These advantages must, of course, be balanced against disadvantages. There is the argument that cheaper, quicker and less formal **hearings** result in a poor quality service. Nevertheless, the increasing use of tribunals and arbitration seems to indicate that they are a popular way of resolving disputes. On a wider point, they also increase access to justice for the ordinary people who make up 38 per cent of the plaintiffs.

Notes to the Text

1. expert assessor — эксперт-консультант
2. judging panel — состав, список судей

Упражнение 1. Дайте русские эквиваленты выделенным словам и словосочетаниям, переведите предложения.

1. A **hierarchy of courts** is an organization with levels of authority from the highest to the lowest courts. 2. To **appeal** means to take a case to a higher court in the hope of a new decision. 3. A request to a higher court to reexamine and change the judgment of a previous court hearing is called an **appeal**. 4. An appellant is the person or the party that requests an appeal. 5. **Adjudication** is an act of giving a judgment or of deciding a legal problem. 6. The courts called **tribunals** are specialist courts outside the judicial system which examine special problems and make judgments. 7. To **arbitrate** is to settle a dispute between parties by referring it to an **arbitrator** instead of going to court. 8. The word «**legislation**» means making laws or the laws made. 9. **Jurisdiction** is administration of justice or the extent of legal authority. 10. An **assessor expert** helps and advises a judge on technical matters in a particularly difficult case. 11. **Disputes** are disagreements or arguments. **To be in dispute** means to be in opposition to each other. 12. The agreement is **binding** on all parties, that is, all parties signing it must do what is agreed. 13. **To bind** is to place a court under legal obligation to act in accordance with a previous judicial decision.

Упражнение 2. Заполните пропуски.

1. We have no authority to deal with this matter: it does not come within our ... 2. The person who goes to a higher court to ask

it to change a decision or a sentence of a lower court is known to be called an ... 3. To ... means to take a question to a higher court for rehearing and a new decision. 4. An ... is a person giving a decision on a legal problem in an industrial dispute. 5. The judicial ... implies that judges in the higher courts have more authority than those in the lower courts. 6. Labour ... is laws concerning the employment of workers. 7. ... is the settlement of a dispute between parties by an outside person, chosen by both parties. 8. He lost his ... for damages against the company. 9. Industrial ... are courts which can decide in disputes between employers and employees. 10. Industrial or labour ... are arguments between management and workers. 11. ... precedent is a decision of a higher court which has to be followed by a judge in a lower court.

Упражнение 3. Составьте словосочетания глаголов из колонки А и существительных из колонки В.

A	B
1. hear / treat	a. interests
2. play	b. a rule
3. regulate	c. a case
4. resolve / settle	d. facts
5. make	e. relations
6. observe	f. with power
7. protect	g. a part / role
8. keep	h. a dispute / argument
9. invest	i. to a higher court
10. assess	j. smth. to the minimum
11. appeal	k. a decision

Упражнение 4. Подберите к глаголам из колонки А близкие по значению слова и словосочетания из колонки В.

A	B
1. abolish	a. express disagreement
2. agree	b. consider, deal with
3. argue	c. legally force to do smth.
4. avoid	d. put an end to
5. bind	e. say «yes», be of the same opinion
6. establish	f. keep away from, escape
7. settle / resolve	g. set up
8. treat	h. decide, determine

Упражнение 5. Подберите к словам из колонки А синонимы или близкие по значению словосочетания из колонки В.

A	B
1. issue	a. trial
2. capacity	b. subject of a dispute; question for discussion
3. benefit	c. ability
4. hearing	d. advantage; help
5. extra	e. adaptable
6. strict	f. highest
7. ordinary	g. outside
8. expertise	h. precisely limited; exactly defined
9. supreme	i. normal, usual
10. flexible	j. expert knowledge

Упражнение 6. Заполните пропуски антонимами.

inside	...	formal	...
...	the latter	...	informality
agreement	...	old	...
...	fairly	...	dissimilarity

Упражнение 7. Назовите прилагательные с суффиксом *-able*, означающие:

- 1. that can be argued
- 2. that can be enforced
- 3. that can be avoided
- 4. that can be agreed

Упражнение 8. Заполните таблицу на словообразование.

Verb	Noun	Adjective
...	...	legislative
...	avoidance	...
...	...	arguable
impart	...	...
...	...	agreeable
...	enforcement	...

Упражнение 9. А. Назовите 20–25 ключевых слов и словосочетаний на тему «Judicial institutions and courts».

В. Speak about:

1. The difference between courts of first instance and appellate courts.
2. The purpose of tribunals and arbitration.
3. The advantages of arbitration.

Text 5

Какие требования предъявляют к квалификации юриста в современном обществе? Прочитайте и переведите текст.

The Profession of Lawyers

The word «lawyer» describes a person who practices law, who has become officially qualified to act in certain legal matters because of examinations he has taken and professional experience he has gained. Most countries have different groups of lawyers who each take a particular kind of examination in order to qualify to do particular jobs. In Japan, a lawyer must decide whether he wants to take examination to become an **attorney**, a public prosecutor or a judge.

A distinctive feature of the legal profession in England is that it is divided into two groups: **barristers** and **solicitors**. Barristers are lawyers who specialize in **arguing cases** in front of a judge and have an exclusive right to be heard, the **right of audience**¹, in all law courts in England, even in the highest courts. They are not paid directly by clients, but are employed by solicitors. Judges are usually chosen from the most senior barristers, and once appointed they cannot continue to practice as barristers. Solicitors are lawyers who do much of the initial preparation for cases. They prepare legal documents (e.g. wills, sale of land or buildings), advise clients on legal matters, and speak **on their behalf**² in lower courts. In other words, a barrister spends most of his time either in a courtroom or preparing his arguments for the court and a solicitor spends most of his time in an office giving advice to clients and making investigations. Many people in England believe the distinction between barristers and solicitors should be eliminated, as it has already happened in Australia.

In both the United States and other industrialized countries, lawyers are becoming more and more specialized. Working in small firms, lawyers now tend to restrict themselves to certain kinds of work and lawyers working in large law firms or employed in the law departments of a large commercial enterprise work on highly specific areas of law.

How to enter the profession of lawyers? Lawyers are subject to standardized examination and other controls to regulate their com-

petence. In some countries in order to practice as a lawyer it is necessary to obtain a university degree in law. However, in others, a degree may be insufficient; professional examinations must be passed. In Britain, the main requirement is to have passed the Bar Final examination (for barristers) or the Law Society Final examination (for solicitors). Someone with a university degree in a subject other than law needs first to take a preparatory course. Someone without a degree at all may also prepare for the final examination, but this will take several years. In most countries, lawyers would say that the time they spent studying for their law finals was one of the worst period of their life. This is because an enormous number of procedural rules covering a wide area of law must be memorized. In Japan, where there are relatively few lawyers, the examinations are supposed to be particularly hard: less than 5 per cent of candidates pass.

A solicitor in England must then spend two years as an **articled clerk**³, during which time his work is closely supervised by an experienced solicitor, and then he must take further courses. A barrister spends a similar year serving as a **pupil** under an experienced barrister.

In most countries, once a lawyer is fully qualified he receives a certificate proving his right to sell his service. There are also insurance provisions so that if a lawyer is ever successfully sued by a client for professional incompetence, there will be funds available to enable him to pay damages. Even if a lawyer is very competent, he must take care not to break the many rules of procedure and ethics set by the body which regulates his profession. In England, the body regulating the conduct of solicitors is the Law Society. There is also a Solicitor's Disciplinary Tribunal with the power to **suspend** or even disqualify a solicitor.

In most legal systems, conversations between a lawyer and his client are **privileged**: the client should know that what he says will not be passed on to someone else without his permission. In theory, it could pose difficult ethical problems for a lawyer. For instance, what should he do in a criminal case if he believes his client guilty? In any case, it is the prosecution's job to prove guilt, not the defence's to prove innocence. A lawyer could therefore defend his client simply by trying to point out weaknesses in the prosecution case.

Notes to the Text

1. the right of audience — право выступать в суде
2. on their behalf — от их имени

3. articulated clerk — служащий конторы солиситора, выполняющий свою работу в порядке платы за обучение профессии солиситора

Упражнение 1. Составьте словосочетания глаголов из колонки А и существительных из колонки В.

А	В
1. enter	a. advice
2. prepare/ prepare for	b. a degree in law
3. become	c. time
4. gain	d. a problem
5. give	e. examinations
6. argue	f. a job
7. pose	g. on one's behalf
8. speak	h. a profession
9. get/ obtain	i. guilt/ innocence
10. prove	j. a case
11. take/ pass	k. experience
12. do	l. arguments, documents/ the final exam
13. spend	m. a lawyer

Упражнение 2. Назовите 5 словосочетаний со словами *law* и *legal*.

Упражнение 3. Заполните пропуски.

1. ... is a general term for a member of the legal profession, e.g. a judge, barrister, solicitor, law teacher, etc. 2. The common purpose of a barrister and a solicitor is to provide professional service and advice on legal ... 3. Barrister is a lawyer who can speak and ... a case in one of the higher courts. 4. Attorneys are persons who are legally allowed to act on ... of someone else. 5. Solicitors may now have a right of... in certain courts. 6. At present a solicitor may choose any ... to advise his client or to appear for the client in court. 7. ... is a clerk who has passed the examination to become a solicitor but has to work in a solicitor's office for some years to learn the law. 8. ... means protected by privilege, e.g. a letter from a client to his lawyer. 9. Jurors are members of a ... 10. Jurist is an expert in ... 11. Jurisprudence is science and philosophy of human ...

Упражнение 4. Заполните пропуски следующими словами: *legal*, *legally*, *legalize*, *legalization*.

1. To ... is to make something legal. 2. To sue means to take ... action against someone in a civil court. 3. The directors of large commercial enterprises are ... responsible. 4. The ... of labour relations is reflected in the law of employment.

Упражнение 5. Заполните пропуски синонимами или словами, близкими по значению.

- ... higher in authority

... remove

... limit

... need / require

... hand / give to smb. else

... show / direct attention to
- ... some

... discuss / debate

... rule / order

... not general

... control systematically

... think

Упражнение 6. Заполните пропуски антонимами.

- sufficient ...

... incompetent

weak ...

... lower court

qualify ... different

... final exam
- guilt ...

... strength

competence ...

... junior

... very small

Упражнение 7. Заполните таблицу на словообразование.

Verb	Noun	Adjective
exclude	...	...
...	practice	...
...	...	arguable
...	restriction	...
...	...	advisory
...	preparation	...
specify	...	...
...	qualification	...
weaken	...	...

Упражнение 8. А. Назовите 20–25 ключевых слов и словосочетаний на тему «Professional titles in legal systems».

В. Speak about:

How to become a lawyer in different countries.

SUPPLEMENTARY TEXTS

To be read after Text 2

Computer crime

Computers can be used to commit all kinds of crimes. It is suggested that one could commit murder by computer if one hacked

into an air-traffic controller's computer system and caused aeroplanes to crash, with the intent¹ to kill the passengers. Not surprisingly crimes that specifically relate to computers are relatively recent creations of statute.

Some specific computer crimes are set out in the Computer Misuse Act 1990. It is designed to protect information kept on computers. There are three particular reasons why such information needs protection by the criminal law. Firstly it is said to be very hard to safeguard information stored on a computer, particularly as often the information is intended to be accessed by a number of authorized people. By contrast information on paper can be kept in a safe or other secure² place. Secondly the ease of destroying or corrupting data on a computer means it deserves³ special protection, particularly as it is not always possible for the owner of the computer to realize that the data have been looked at. Thirdly the highly confidential⁴ nature of the kind of information kept on computers (often concerning many members of the public) is such that it needs particular protection.

The act prohibits⁵ «hacking», i.e., gaining⁶ unauthorized access to computer material. The offence is committed if a defendant is entering the computer just to see what he can find. The Act also contains a more serious offence of doing this with the intent to commit another offence. The most common example is likely to be a deception (обман) offence or theft. A defendant who obtained data which he intended to use in the future to commit an offence of obtaining property by deception will still be guilty of the more serious offence.

There is also an offence of modifying computer material in an unauthorized way. This section is clearly aimed at people who alter⁷ computer data with intent to corrupt a program. The intent does not need to be directed towards any particular computer or data. Modification is defined as including removal of any program or data on a computer and includes adding to the contents or erasing⁸ them.

It also includes temporary⁹ modification. It would appear to cover sending someone a disc with a virus on it that was intended to damage the working of the computer.

It is possible to be guilty of criminal damage of computers if there has been a physical change to some components of the computer.

Notes to the Text

1. (legal) purpose, intention
2. safe

3. have a right to
4. (to be kept) secret
5. say that smth. must not be done (by rules of regulations)
6. obtain
7. change
8. removing
9. lasting for a short time only

To be read after Text 3

The Jury

The jury has a long history within the English legal system, although its role has changed significantly during that time. Originally, members of the jury were witnesses¹. Today, they are a group of twelve ordinary people with no special knowledge, chosen at random to act as impartial² judges of the facts of a case. In a jury trial, the jury is advised by the trial judge on the relevant³ law; that is, the judge's function is to explain the law to the jury and ensure that the trial is conducted according to the rules of procedure and evidence. The function of the jury is then to apply the law to the facts and then decide, in criminal cases, whether the defendant is guilty or not guilty and, in civil cases, whether the defendant is liable to the plaintiff. The decision of a jury is called a verdict⁴. The juries do not need to give reasons for their verdict. In civil cases the jury will also decide on the amount of damages to be awarded to the plaintiff.

«Shadow» («ТЕНЕВОЙ») juries are sometimes used to research the adequacy of the jury system; a random group of twelve people sits in the court and hears a case and reaches a verdict which is then compared to the verdict of the real jury.

Although the jury continues to have much symbolic importance in the English legal system, in practice its role has been greatly diminished⁵ over recent years.

Notes to the Text

1. a person who gives evidence in court
2. just, fair; not favouring one side more than the other
3. (closely) connected with what is being discussed, done, etc.
4. decision reached by a jury
5. make or become less

Judges

Judge is a public officer with authority to hear and decide cases in a law court. In the British system of law judges are chosen from lawyers who have gained considerable experience as legal practitioners before being appointed to the judiciary.

Judges must be independent of the parties to a dispute (this ensures a fair and just trial). They must be independent of the executive. This enables the judges to exercise control over government action. Judges must be free of any political bias (пристрастность, предубеждение).

Most of the work of the judges is judicial in the sense that they have to adjudicate upon disputes. To do this they are required, impartially, to find the facts based on the evidence presented to the court, to apply the law to the facts and then to give the right decision. Their role is therefore limited to ensuring that there is a fair trial, reaching a decision on the fact as presented to them and applying this to the law.

Judges do not investigate the cases they are trying but they do not play a completely passive role; they may, sometimes, question witnesses and they must ensure that the trial is conducted according to the rules of procedure and evidence.

ТЕРМИНОЛОГИЧЕСКИЙ СЛОВАРЬ

А

abolish [ə'bo:liʃ] *в* аннулировать; отменять; упразднять

accused [ə'kju:zd] *и* обвиняемый

adjudicate [ə'dʒʊdikeɪt] *в* судить, выносить приговор

alter ['ɔ:lteɪ] *в* изменять(ся); вносить изменения

appeal [ə'pi:l] *и* апелляция; апелляционная жалоба; обращение; *в* обжаловать, апеллировать, подавать апелляционную жалобу; ~ **court** (**Appellate court**) апелляционный суд

apportion [ə'pɔ:ʃən] *в* распределять; разделять, делить (*соразмерно, пропорционально*)

argue ['ɑ:gju:] *в* аргументировать; приводить доводы

assessment [ə'sesmənt] *и* оценка; определение; **reassessment** *и* пересмотр

attorney [ə'tə:nɪ] *и* поверенный; адвокат; юрист

В

barrister ['bærɪstə] *и* адвокат; баррист

behaviour [bi'heɪvjə] *и* поведение

bind [baɪnd] *в* обязывать, связывать обязательствами; ограничивать

blame [bleɪm] *и* порицание; ответственность

breach [bri:tʃ] *n* нарушение (закона, обязательства)

burglar ['bɜ:glə] *n* вор-взломщик, громила

burglary ['bɜ:gləri] *n* кража со взломом

С

case [keɪs] *n* судебное дело, прецедент, факт

cell [sel] *n* тюремная камера

civil ['sɪvl] *a* гражданский; ~ **law** гражданское право; ~ **code** гражданский кодекс; ~ **wrong** [rɒŋ] нарушение гражданских прав

charge [tʃɑ:ʒ] *v* обвинять; **to be charged with** обвинять в чем-то

claim [kleɪm] *n* претензия; заявление; иск; рекламация

commit [kə'mɪt] *v* совершать (*преступление*); ~ **a crime** совершать преступление

Commonwealth Countries Британское Содружество (*наций*)

content ['kɒntent] *n* содержание; суть; сущность

convict ['kɒnvɪkt] *v* выносить приговор; признавать виновным

conduct ['kɒndʌkt] *n* поведение, образ действий

court [kɔ:t] *n* суд

custom ['kʌstəm] *n* обычай

Д

damages ['dæmɪdʒɪz] *n* убытки, компенсация за убытки; иск о возмещении убытков

defend [dɪ'fend] *v* защищать в суде

defence [dɪ'fens] *n* защита на суде;

self ~ самооборона; самозащита

defendant [dɪ'fendənt] *n* обвиняемый

deserve [dɪ'zɜ:v] *v* заслуживать, быть достойным; иметь право на защиту

despite [dɪs'paɪt] *prep* несмотря на

diminish [dɪ'mɪnɪʃ] *v* уменьшать

Е

enforce [ɪn'fɔ:s] *v* принуждать; навязывать; заставлять

equity ['ekwɪtɪ] *n* право справедливости (*система права, действующая наряду с общим правом и писаным, статутным правом; дополняет обычное право*)

erase [ɪ'reɪz] *v* стирать; вычеркивать (*из памяти*)

erasing *n* стирание записи

evidence ['eɪdɪns] *n* улика; свидетельские показания

executive [ɪg'zekjʊtɪv] *n* (*the ~*) исполнительная власть; исполнительный орган

Ф

fair [fɛə] *a* честный; справедливый; беспристрастный

fine [faɪn] *n* штраф

Г

gain [geɪn] *n* прибыль, выгода; *v* извлекать пользу, выгоду

guilty ['gɪltɪ] *a* виновный

Н

hear [hɪə] *v* слушать, заслушивать; разбирать

И

impartial [ɪm'pɑ:ʃəl] *a* беспристрастный, справедливый

injunction [ɪn'ʃʌŋkʃən] *n* предписание, приказ; судебный запрет

innocent ['ɪnəsənt] *a* невиновный

intent [ɪn'tent] *n* намерение, цель

investigate [ɪn'vestɪgeɪt] *v* расследовать

J

judge ['dʒʌdʒ] *n* судья

judgment/judgement ['dʒʌdʒmənt] *n* приговор, решение суда

judiciary [dʒu:'dɪʃɪəri] *n* суд, судебная система; ~ **law** судебное право

jury ['dʒuəri] *n* присяжные (*выносящие приговор по гражданским и уголовным делам*)

justice ['dʒʌstɪs] *n* справедливость; правосудие; юстиция

L

law [lɔ:] *n* право; **case** ~ прецедентное право; **common** ~ общее (*обычное*) право; **constitutional** ~ конституционное право; **civil** ~ гражданское право; **criminal** ~ уголовное право; **procedural** ~ процедурное право; **statute** ~ статутное право, «письменный закон»; **substantive and procedural** ~ материальное и процессуальное право; ~ **of contract** договорное (*обязательное*) право; ~ **of employment** трудовое право; право занятости (*работы, службы*); ~ **and order** порядок, правопорядок; **break the** ~ нарушить закон; **to lay down the** ~ устанавливать правовые нормы
lawmaking body *n* законодательный орган

lawyer ['lɔ:jə] *n* адвокат, юрист

legal ['li:gəl] *a* юридический, правовой; ~ **action** судебный иск

liability [laɪə'bɪlɪti] *n* ответственность

loss [lɒs] *n* потеря; урон

M

manslaughter ['mæn,s'lɔ:tə] *n* непредумышленное убийство

murder ['mɜ:də] *n* убийство (*предумышленное*)

N

negligent ['neglɪdʒənt] *a* небрежный, халатный, невнимательный

negligence ['neglɪdʒəns] *n* небрежность, халатность; преступная небрежность

O

offence [ə'fens] *n* проступок, нарушение; преступление; **criminal** ~ уголовное преступление; **minor** ~ мелкое нарушение, проступок

P

paramount ['pærəmaʊnt] *a* верховный, высший, первостепенный

participate [pɑ:'tɪsɪpeɪt] *v* участвовать

party ['pɑ:ti] *n* сторона

petty ['petɪ] *a* мелкий, незначительный

plead [pli:d] *v* **to** ~ **guilty** признавать себя виновным в предъявленном обвинении; **to** ~ **not guilty** заявить о своей невиновности; не признавать себя виновным

police [pə'li:s] *n* полиция; **the** ~ **station** полицейский участок

pose [pəʊz] *v* предлагать, ставить (*задачу, вопрос*)

prescribe [prɪs'kraɪb] *v* предписывать

prison ['prɪzn] *n* тюрьма

prisoner *n* заключенный

privileged ['prɪvɪlɪdʒd] *a* сообщенные клиентом и не подлежащие оглашению (*сведения*)

probation [prə'beɪʃən] *n* испытательный срок; вид условного наказания; условное освобождение на поруки

procedure [prə'si:dʒə] *n* процедура

prohibit [prə'hɪbɪt] *v* запрещать

property ['prɒpəti] *n* имущество, собственность, хозяйство

prosecute ['prɒsɪkjʊ:t] *v* преследовать судебным порядком; выступать в качестве обвинителя

punish ['pʌnɪʃ] *v* наказывать

punishment *n* наказание; **capital** ~ смертная казнь, высшая мера наказания; **corporal** ~ телесное наказание

pupil ['pjʊ:pl] *n* ученик, учащийся

R

rape [reɪp] *n* изнасилование

recover [rɪ'kʌvə] *v* обретать снова, возвращать себе; получить обратно

relevant ['relɪvənt] *a* уместный; относящийся к делу

revision [rɪ'vɪʒən] *n* пересмотр, ревизия

robber ['rɒbə] *n* грабитель

robbery ['rɒbəri] *n* грабеж

S

sense ['sens] *n* **common** ~ здравый смысл

sentence ['sentəns] *n* приговор; *v* осуждать, приговаривать

settle ['setl] *v* урегулировать (*спор, дело*)

shoplifter ['ʃɒp,lɪftə] *n* магазинный вор

shoplifting *n* кража в магазине

shoulder ['ʃəʊldə] *v* брать на себя (*ответственность, вину*)

solicitor [sə'lsɪtə] *n* солиситор, адвокат (*дающий советы клиенту; подготавливающий дела для барристера и выступающий только в судах низшей инстанции*)

striking ['straɪkɪŋ] *a* поразительный

subject [səb'dʒekt] *v* подвергать (*воздействию, влиянию, экзамену*); **to be ~ to** подлежащий чему-либо

subject-matter *n* предмет договора-спора

substance ['sʌbstəns] *n* сущность, суть, содержание

sue [sju:] *v* преследовать судебным порядком, возбуждать дело

supervise ['sju:pəvaɪz] *v* наблюдать (*за чем-то*); надзирать

suspect ['sʌspekt] *v* подозревать

suspend [səs'pend] *v* временно отстранять; исключать

T

temporary ['tempərəri] *a* временный

thief [θi:f] *n* вор

theft [θeft] *n* воровство, кража

tort [tɔ:t] *n* деликт; гражданское правонарушение

treat [tri:t] *v* обращаться; считать; рассматривать

tribunal [traɪ'bju:nl] *n* суд, орган правосудия, судебное учреждение

U

unauthorized ['ʌn'ɔ:θəraɪzd] *a* неразрешенный; неправомерный; несанкционированный

V

victim ['vɪktɪm] *n* жертва; пострадавший

W

will [wɪl] *n* завещание

witness ['wɪtnɪs] *n* свидетель

wholly ['həʊli] *adv* полностью, целиком

ОСНОВНЫЕ ЗНАЧЕНИЯ И ПРИМЕРЫ УПОТРЕБЛЕНИЯ НЕКОТОРЫХ ПРЕДЛОГОВ

Prepositions	English	Russian
about <i>о, около, по</i>	This article is about new engines. I shall come at about 5 o'clock. He was walking about the room. The shaft turns about its axis.	Эта статья о новых двигателях. Я приду около 5 часов. Он ходил по комнате. Вал вращается вокруг (относительно) своей оси.
after <i>после, за, о</i>	He finishes his work after 5. I came here after him. I was going after him. He asked after you.	Он заканчивает работу после пяти. Я пришел сюда после него. Я шел за ним. Он спрашивал о вас.
at <i>за, в, на, у</i>	We are sitting at a table. We are sitting at a lesson. We are at the concert. We are sitting at the window. He works at a plant. He studies at the institute. I get up at 8 o'clock.	Мы сидим за столом. Мы на уроке. Мы на (в) концерте. Мы сидим у окна. Он работает на заводе. Он учится в институте. Я встаю в 8 часов.
before <i>до, перед</i>	He was here before you. The car stopped before the house.	Он был здесь до вас. Машина остановилась перед домом.
beyond <i>за, вне</i>	The sun disappeared beyond the forest. It is beyond any doubt.	Солнце скрылось за лесом. Это вне всяких сомнений.
by <i>у, к</i>	He is standing by the window. I'll come by six. He went by train.	Он стоит у окна. Я приду к шести. Он поехал поездом.
for <i>для, в течение</i>	I have brought this book for you. I shall be working here for two hours.	Я принес эту книгу для вас. Я буду работать здесь в течение двух часов.
from <i>из, у, с, в</i>	He arrived from Kiev. He arrived from the Far East. I have taken this book from the library. Take this book from him. He works here from two till five o'clock.	Он приехал из Киева. Он приехал с Дальнего Востока. Я взял эту книгу в библиотеке. Возьмите у него эту книгу. Он работает здесь с двух до пяти часов.

Prepositions	English	Russian
in в, через	I shall be in Moscow soon. We shall finish our work in half an hour. In winter we often skate.	Я скоро буду в Москве. Мы окончим нашу работу че- рез полчаса. Зимой мы часто катаемся на коньках.
of о, об, из	He spoke of his work. Tables are made of wood.	Он говорил о своей работе. Стол ~~ы~~ делают из дерева.
on на, в, по	The book is on the table. Come on Monday. This book is on chemistry. Studies begin on the 1st of September.	Книга на столе. Приходите в понедельник. Эта книга по химии. Занятия начинаются первого сентября.
over через, по, над	The boy jumped over the bench. The lamp is over the table. He travelled all over the country.	Мальчик перескочил через скамейку. Лампа над столом. Он путешествовал по всей стране.
to к, в, с	Let's go to the library. I'll speak to him. Come to the blackboard.	Давайте пойдем в библиотеку. Я с ним поговорю. Подойдите к доске.
with с	He works with me.	Он работает со мной.
within через, в	I hope to finish my article within two days. The pressure in the boiler changes within definite limits. It is within my power.	Я надеюсь окончить статью через два дня. Давление в котле изменяется в определенных пределах. Это в моих возможностях.

НАИБОЛЕЕ УПОТРЕБИТЕЛЬНЫЕ СОЮЗЫ

Conjunction	English	Russian
and <i>и, а</i>	There are many English and German books in our library. One of his brothers is a mathematician and the other is a philologist.	В нашей библиотеке много английских и немецких книг. Один из его братьев математик, а другой — филолог.
as well as <i>так же, как и, а также</i>	The internal combustion engines can operate on oil and kerosine as well as benzine.	Двигатели внутреннего сгорания могут работать на нефти и керосине, а также на бензине.
both ... and <i>как... так и, и... и</i>	This engine radically differs both in construction and operation from that designed 5 years ago.	Этот двигатель коренным образом отличается от двигателя, разработанного 5 лет назад, как по конструкции, так и по работе.
but <i>но, а</i>	He is very busy, but he promised to take part in the discussion.	Он очень занят, но обещал принять участие в обсуждении.
either ... or <i>или ... или</i>	He will deliver his report either at this meeting or at the next.	Он сделает доклад или на этом собрании, или на следующем.
neither ... nor <i>ни ... ни</i>	He was neither in the Crimea, nor in the Caucasus.	Он не был ни в Крыму, ни на Кавказе.
or <i>или, иначе</i>	Hurry up, or you will be late.	Поторопитесь, или вы опоздаете.
yet <i>однако, все же</i>	My experiment seems to have been successful; yet I am not satisfied.	Мой опыт, кажется, прошел успешно, и все же я не удовлетворен.

ПРЕДЛОГИ, НАРЕЧИЯ И СОЮЗЫ, СОВПАДАЮЩИЕ ПО ФОРМЕ

В английском языке есть союзы, предлоги и наречия, совпадающие по форме. Их значение определяется функцией и местом в предложении.

Если слово стоит перед существительным или другой частью речи, имеющей именные свойства, то это — предлог.

Если слово относится к глаголу (или словам, имеющим глагольную основу) и имеет самостоятельное значение, выполняя функцию обстоятельства, то это — наречие.

Если слово вводит придаточное предложение или связывает однородные члены предложения, то это — союз.

Слово	Предлог	Наречие	Союз
about	He spoke about his method. <i>Он говорил о своем методе.</i> It is about 5 o'clock. <i>Сейчас около пяти часов.</i>	We were about to go. <i>Мы собирались уйти.</i> He was walking somewhere about . <i>Он ходил где-то около (недалеко).</i>	—
above	He fixed a lamp above the table. <i>Он укрепил лампу над столом.</i>	Repeat the above mentioned rule. <i>Повторите вышеупомянутое правило.</i>	—
across	There was no bridge across the river. <i>Через реку не было моста.</i>	We took a boat to get across . <i>Мы взяли лодку, чтобы перелбратсьа на ту сторону.</i>	—
after	I shall go home after the lecture. <i>Я пойду домой после лекции.</i>	We shall decide this after . <i>Мы решим это потом.</i>	He rang up after you had left. <i>Он позвонил, после того как вы ушли.</i>
along	He went along the street. <i>Он пошел по улице.</i>	He brought his book along with the books from the library. <i>Он принес свою книгу наряду с книгами из библиотеки.</i>	—
around	There is a high fence around our garden. <i>Вокруг нашего сада высокий забор.</i>	There was snow all around . <i>Кругом был снег.</i>	—

Слово	Предлог	Наречие	Союз
before	He stood before his chief. <i>Он стоял перед своим начальником.</i>	I heard this before . <i>Я слышал это раньше.</i>	He went away before you came. <i>Он ушел, прежде чем вы пришли.</i>
behind	There is a sports ground behind our house. <i>За нашим домом есть спортплощадка.</i>	The camp was left far behind . <i>Лагерь остался далеко позади.</i>	—
below	The temperature was kept below 70 °C. <i>Температура поддерживалась ниже 70 °C.</i>	This word is given below . <i>Это слово дается ниже.</i>	—
but	—	I have but two English books. <i>У меня есть только две английские книги.</i>	He gave me a pen, but I want a pencil. <i>Он дал мне ручку, а мне нужен карандаш.</i>
by	I'll be back by Monday. <i>Я вернусь к понедельнику.</i>	She passed him by . <i>Она прошла мимо него.</i>	—
for	This text is not difficult for me. <i>Этот текст не труден для меня.</i> I waited for an hour. <i>Я ждал в течение часа.</i>	—	I can translate this text, for it is not difficult. <i>Я могу перевести этот текст, так как он не труден.</i>
on	This book is on the table. <i>Книга на столе.</i>	Read on . <i>Читайте далее.</i>	—
since	I have not seen him since the beginning of the school year. <i>Я не видел его с начала учебного года.</i>	He left in 1990 and I have not seen him since . <i>Он уехал в 1990 году, и я его с тех пор не видел.</i>	I have not seen him since the school year began. <i>Я не видел его с тех пор, как начался учебный год.</i>
till	I shall not rest till Sunday. <i>Я не буду отдыхать до воскресенья.</i>	—	I shall not rest till I have finished my work. <i>Я не буду отдыхать, пока не закончу работу.</i>

НАИБОЛЕЕ УПОТРЕБИТЕЛЬНЫЕ СУФФИКСЫ

Суффиксы	Примеры	
-er, -or	to read — reader <i>читать — читатель</i>	to elect — elector <i>избирать — избиратель</i>
-ant, -ent	to assist — assistant <i>помогать — помощник</i>	to study — student <i>изучать — студент</i>
-ist	to type — typist <i>печатать — машинистка</i>	
-ian, -ese	Russia — Russian <i>Россия — русский</i> electricity — electrician <i>электричество — электрик</i>	China — Chinese <i>Китай — китаец</i>
-ion, -tion, -ation, -sion, -ssion	to assert — assertion <i>утверждать — утверждение</i> to organize — organization <i>организовывать — организация</i> to collide — collision <i>сталкиваться — столкновение</i>	to connect — connection <i>соединять — соединение</i> to admit — admission <i>допускать — допущение</i>
-age	to clear — clearance <i>очищать — очистка</i>	
-ment	to fulfill — fulfillment <i>выполнять — выполнение</i>	
-ure	to press — pressure <i>давить — давление</i>	
-ance, -ence	to appear — appearance <i>появляться — появление</i>	to depend — dependence <i>зависеть — зависимость</i>
-ing	to begin — beginning <i>начинать — начало</i>	
-ness	dark — darkness <i>темный — темнота</i>	
-ity, -th	active — activity <i>активный — активность</i>	wide — width <i>широкий — ширина</i>
-dom, -ism, -hood, -ship	free — freedom <i>свободный — свобода</i> child — childhood <i>ребенок — детство</i>	real — realism <i>действительный — реализм</i> friend — friendship <i>друг — дружба</i>

Суффиксы	Примеры	
-able, -ible	to move — movable <i>двигать — подвижный</i>	to sense — sensible <i>ощущать — ощутимый</i>
-ant, -ent, -ive	to differ — different <i>различаться — различимый</i>	to act — active <i>действовать — деятельный</i>
-ful, -en, -al	use — useful <i>польза — полезный</i> center — central <i>центр — центральный</i>	gold — golden <i>золото — золотой</i>
-ic, -ous	history — historic <i>история — исторический</i>	advantage — advantageous <i>преимущество — выгодный</i>
-y, -ly	dirt — dirty <i>грязь — грязный</i>	day — daily <i>день — ежедневный</i>
-less, -ish	use — useless <i>польза — бесполезный</i>	old — oldish <i>старый — староватый</i>
-en, -fy	fast — to fasten <i>крепкий — укреплять</i>	simple — to simplify <i>простой — упрощать</i>
-ze, -ward	real — to realize <i>настоящий — осуществлять</i>	on — onward <i>на — вперед</i>
-ly	bad — badly <i>плохой — плохо</i>	

НАИБОЛЕЕ УПОТРЕБИТЕЛЬНЫЕ ПРЕФИКСЫ

Префиксы	Примеры	
un-, dis-	common — un common обыкновенный — необыкновенный	ability — dis ability способность — неспособность
over-, under-	to heat — to over heat нагревать — перегревать	estimate — under estimate оценивать — недооценивать
post-, pre-	war — post -war война — послевоенный	war — pre -war война — довоенный
re-, sub-	write — to re write написать — переписать	way — sub way дорога — подземная дорога
il-, im-	logical — il logical логичный — нелогичный	polite — im polite вежливый — невежливый
anti-, inter-	frictional — anti frictional фрикционный — антифрикционный	change — inter change обмен — взаимообмен
co-	existence — co existence существование — сосуществование	

СПИСОК СОКРАЩЕНИЙ, ВСТРЕЧАЮЩИХСЯ В ТЕХНИЧЕСКОЙ ЛИТЕРАТУРЕ

A.C. Ante Christum — *лат.* до нашей эры
ac alternating current — переменный ток
a.m. ante meridiem — *лат.* до полудня
B.C. before Christ — до нашей эры
BTU British Thermal Unit — Британская тепловая единица
C Centigrade — стоградусный (шкала Цельсия)
cc cubic centimetre — кубический сантиметр
ccw counter clockwise — против движения часовой стрелки
cwt hundredweight — центнер; (50,8 кг в Англии и 45,3 кг в США)
dc direct current — постоянный ток
deg. degree — градус
e.g. exempli gratia — *лат.* например
e.m.f. electromotive force — электродвижущая сила
etc. et cetera — *лат.* и т.д.
Fahr. (F) Fahrenheit — шкала Фаренгейта
f.p.s feet per second — футов в секунду
ft. foot; feet — фут(ы)
gal. gallon — галлон
gr gram(me) — грамм

h (hr) hour — час
hp horsepower — лошадиная сила
i.e. id est — *лат.* то есть
kv kilovolt — киловольт
kva kilovolt-ampere — киловольт-ампер
kw kilowatt — киловатт
lb libra pound — *лат.* фунт
m metre — метр; mile — миля; minute — минута
mm millimetre — миллиметр
m.p.h. miles per hour — миль в час
p. page — страница
p.c. pro centum — *лат.* per cent — процент
p.m. post meridiem — *лат.* после полудня
psi pounds per square inch — фунтов на квадратный дюйм
R Reaumur — шкала Реомюра
r.p.m. revolutions per minute — оборотов в минуту
r.p.s. revolutions per second — оборотов в секунду
sq. square — квадратный
t. temperature — температура; ton — тонна
viz videlicet — *лат.* а именно
vs versus — *лат.* против
v.v. vice versa — *лат.* наоборот
w watt — ватт

СПИСОК НАИБОЛЕЕ УПОТРЕБИТЕЛЬНЫХ МАТЕМАТИЧЕСКИХ ЗНАКОВ

$+$ plus	a'' [ei] second, double prime, double dashed
$-$ minus	a_n [ei] sub n , subscribed n
$\pm$ plus or minus	$\int$ integral sign
$=$ is equal to, equals	$\iint$ double integral
$\neq$ does not equal	$()$ parentheses
$\equiv$ identical, identically equal to	$[]$ brackets
$\sim$ equivalent, similar (is similar to)	$\{ \}$ braces
$>$ is greater than	LCM (lcm) least common multiple
$<$ is less than	GCD (gcd) greatest common divisor
$\rightarrow$ approaches	$\angle$ angle
∞ varies as, is proportional to	$\perp$ right angle
∞ infinity	$\perp$ perpendicular (is perpendicular to)
ab a times b ; a multiplied by b	$\parallel$ parallel (is parallel to)
a/b the ratio of a to b ; a divided by b	$\triangle$ triangle
proportion: a is to b as c is to d	$\square$ parallelogram
a^n the n -th power of a ; $aaa\dots$ to n factors	$\square$ square
$\sqrt{}$ radical sign	$\bigcirc$ circle
$\sqrt{a}$ square root of a	$\cap$ arc; $A \cap B$ (arc AB)
a^{-n} the reciprocal of a^n ; $1/a^n$	$^\circ$ degrees (of arc or angle)
$\log a$ common logarithm of a	' minutes of arc or angle; foot, feet
$\log_{10} a$ logarithm of a to the base 10	" seconds (of arc or angle); inches
$\ln a$ natural logarithm of a	$\sin A$ — sine of A
$F(x), f(x)$ function of x	$\cos A$ — cosine of A
$y = f(x)$ y is a function of x	$\tan A$ — tangent of A
$\frac{dy}{dx}, \frac{df(x)}{dx}$ the derivative of y with respect to x	$\cot A$ (or $\text{ctn } A$) — cotangent of A
$\frac{d^2y}{dx^2}$ the second derivative of y with respect to x	$\sec A$ — secant of A
a' [ei] prime, dash	$\text{cosec } A$ (or $\text{esc } A$) — cosecant of A

A few examples of reading mathematical expressions

Arithmetic

Addition

$12 + 13 = 25$ Twelve plus thirteen is (masks equals) twenty-five
addend — слагаемое
sum — сумма

Subtraction

$71 - 24 = 47$ Seventy one minus twenty four is (equals) forty-seven
minuend — уменьшаемое
subtrahend — вычитаемое
remainder, difference — разность

Multiplication

$8 \times 6 = 48$ Six times eight is forty-eight (eight multiplied by six is forty-eight)
multiplicant — множимое
multiplier (factor) — множитель
product — произведение

Division

$90 : 9 = 10$ Ninety divided by nine is ten
divident — делимое
divisor — делитель
quotient — частное

Fractions

Common fractions

$\frac{1}{2}$ a half (one second); $\frac{1}{4}$ a quarter (one forth)
 $\frac{3}{7}$ three seventh

Proper fractions

$\frac{2}{3}$ (2 — numerator, 3 — denominator)

Improper fractions

$\frac{5}{3}$ (5 — numerator, 3 — denominator)

Mixed number

$5\frac{1}{3}$; $7\frac{2}{9}$ (9 — common denominator)

Decimal fractions

0.4 nought point four (0 [əu] point four)

0.06 nought point nought six (0 [əu] point 0 [əu] six)

.2 point two (period two, two tenth)

.37 point thirty seven (period thirty-seven)

652.47 six hundred fifty-two point forty seven (six five two point forty-seven)

1.007 one point 0 [əu] 0 [əu] seven

Power

raise to a power — возводить в степень

in the second power — во второй степени, в квадрате

in the third power — в третьей степени, в кубе

in the n -th power — в n -ной степени

3^3 3 cubed (three to the third power)

$3a^2$ three a to the second power (3 — coefficient; a — base; 2 — exponent)

Evolution

$\sqrt{\quad}$ square root (radical sign) $\sqrt[3]{\quad}$ cubic root

$\sqrt{4} = 2$ the square root of four is
two

Ratio

$\frac{H}{L}$ ratio H per L ; H to L

$y = f(x)$ y is a function of x

$\frac{dy}{dx}, \frac{df(x)}{dx}$ the derivative of y with
respect to x

$\frac{d^2y}{dx^2}$ the second derivative of
 y with respect to x

1 one; a unit single; once

2 two; a pair; a couple; double;
twice; twice the number; twice as
much

3 three; triple; three times

12 a dozen

20 a score

**ТАБЛИЦА НЕСТАНДАРТНЫХ ГЛАГОЛОВ
(LIST OF NON-STANDARD VERBS)**

Infinitive	Past Simple	Participle II	Значения
be [bi:]	was, were [wɒz, wə:]	been [bi:n]	быть
bear [bɛə]	bore [bɔ:]	born [bɔ:n]	родить; производить
bear [bɛə]	bore [bɔ:]	borne [bɔ:n]	носить, перевозить
beat [bi:t]	beat [bi:t]	beaten [bi:tn]	бить, разбивать
become [br'kʌm]	became [br'keɪm]	become [br'kʌm]	делаться, становиться
begin [br'gɪn]	began [br'gæn]	begun [br'gʌn]	начинать
blow [bləu]	blew [blu:]	blown [bləun]	дуть, раздувать
break [breɪk]	broke [brəʊk]	broken ['brəʊkən]	ломать, нарушать; прекращать
bring [brɪŋ]	brought [brɔ:t]	brought [brɔ:t]	приносить, приводить, привозить
build [bɪld]	built [bɪlt]	built [bɪlt]	строить
burn [bɜ:n]	burnt [bɜ:nt]	burnt [bɜ:nt] burned [bɜ:nd]	жечь, гореть
burst [bɜ:st]	burst [bɜ:st]	burst [bɜ:st]	взрываться, разра- зиться
buy [baɪ]	bought [bɔ:t]	bought [bɔ:t]	покупать
catch [kæʃ]	caught [kɔ:t]	caught [kɔ:t]	ловить; схватить
choose [tʃu:z]	chose [tʃəʊz]	chosen ['tʃəʊzn]	выбирать
come [kʌm]	came [keɪm]	come [kʌm]	приходить, приез- жать
cost [kɒst]	cost [kɒst]	cost [kɒst]	стоять
cut [kʌt]	cut [kʌt]	cut [kʌt]	резать, рубить; стричь
deal [di:l]	dealt [delt]	dealt [delt]	иметь дело; торго- вать
do [du:]	did [dɪd]	done [dʌn]	делать, исполнять

Infinitive	Past Simple	Participle II	Значения
draw [drɔ:]	drew [dru:]	drawn [drɔ:n]	тянуть, везти; рисо- вать, чертить
drink [drɪŋk]	drank [dræŋk]	drunk [drʌŋk]	пить
drive [draɪv]	drove [drəʊv]	driven ['drɪvn]	вести, приводить в движение; гнать
eat [i:t]	ate [et]	eaten ['i:tn]	есть, питаться
fall [fɔ:l]	fell [fel]	fallen ['fɔ:ln]	падать
feed [fi:d]	fed [fed]	fed [fed]	кормить, питать
feel [fi:l]	felt [felt]	felt [felt]	чувствовать
fight [fart]	fought [fɔ:t]	fought [fɔ:t]	сражаться, бороться
find [faɪnd]	found [faʊnd]	found [faʊnd]	находить, обнаруживать
fly [flaɪ]	flew [flu:]	flown [fləʊn]	летать
forbid [fə'brɪd]	forbade [fə'beɪd]	forbidden [fə'brɪdn]	запрещать
forget [fə'get]	forgot [fə'gɒt]	forgotten [fə'gɒtn]	забывать
freeze [fri:z]	froze [frəʊz]	frozen ['frəʊzn]	замораживать, мерз- нуть, застывать
get [get]	got [gɒt]	got [gɒt]	получать, доставать, становиться, делаться
give [gɪv]	gave [geɪv]	given ['gɪvn]	давать, предоставлять
go [gəʊ]	went [went]	gone [gɒn]	идти, ехать
grow [grəʊ]	grew [gru:]	grown [grəʊn]	расти, выращивать; увеличиваться; де- латься
hang [hæŋ]	hung [hʌŋ] hanged [hæŋgd]	hung [hʌŋ] hanged [hæŋgd]	вешать, подвешивать, висеть; казнить через повешение
have [hæv]	had [hæd]	had [hæd]	иметь
hear [hɪə]	heard [hə:d]	heard [hə:d]	слышать
hide [haɪd]	hid [hɪd]	hidden ['hɪdn]	прятать(ся), скры- вать(ся)

Infinitive	Past Simple	Participle II	Значения
hit [hɪt]	hit [hɪt]	hit [hɪt]	ударять(ся), задеть
hold [həʊld]	held [held]	held [held]	держать
hurt [hɜ:t]	hurt [hɜ:t]	hurt [hɜ:t]	вредить; ранить, причинять боль
keep [ki:p]	kept [kept]	kept [kept]	держать, хранить
know [nəʊ]	knew [nju:]	known [nəʊn]	знать
lay [leɪ]	laid [leɪd]	laid [leɪd]	класть, положить; излагать
lead [li:d]	led [led]	led [led]	вести, управлять
learn [lə:n]	learnt [lə:nt] learned [lə:nd]	learnt [lə:nt] learned [lə:nd]	узнавать, учить
leave [li:v]	left [left]	left [left]	оставлять; уходить
let [let]	let [let]	let [let]	позволять, пускать
lie [laɪ]	lay [leɪ]	lain [leɪn]	лежать
light [laɪt]	lit [lɪt]	lit [lɪt]	освещать, зажигать
lose [lu:z]	lost [lɒst]	lost [lɒst]	терять
make [meɪk]	made [meɪd]	made [meɪd]	делать; заставлять
mean [mi:n]	meant [ment]	meant [ment]	означать; подразуме- вать, иметь в виду
meet [mi:t]	met [met]	met [met]	встречать(ся)
pay [peɪ]	paid [peɪd]	paid [peɪd]	платить
put [put]	put [put]	put [put]	класть; ставить
read [ri:d]	read [red]	read [red]	читать
ride [raɪd]	rode [rəʊd]	ridden [rɪdn]	ездить (<i>верхом</i>)
ring [rɪŋ]	rang [ræŋ]	rung [rʌŋ]	звонить
rise [raɪz]	rose [rəʊz]	risen ['rɪzn]	вставать; возникать
run [rʌn]	ran [ræn]	run [rʌn]	бегать; управлять
say [seɪ]	said [sed]	said [sed]	говорить, сказать
see [si:]	saw [sɔ:]	seen [si:n]	видеть

Infinitive	Past Simple	Participle II	Значения
seek [si:k]	sought [sɔ:t]	sought [sɔ:t]	искать; стремиться
sell [sel]	sold [səʊd]	sold [səʊd]	продавать
send [send]	sent [sent]	sent [sent]	посылать
set [set]	set [set]	set [set]	ставить, помещать, устанавливать; заходить (о Солнце)
shake [ʃeɪk]	shook [ʃʊk]	shaken ['ʃeɪkn]	трясти, колебать
shoot [ʃu:t]	shot [ʃɒt]	shot [ʃɒt]	стрелять
show [ʃəʊ]	showed [ʃəʊd]	shown [ʃəʊn]	показывать
shut [ʃʌt]	shut [ʃʌt]	shut [ʃʌt]	закрывать
sing [sɪŋ]	sang [sæŋ]	sung [sʌŋ]	петь
sink [sɪŋk]	sank [sæŋk]	sunk [sʌŋk]	опускаться, погружаться, тонуть
sit [sɪt]	sat [sæt]	sat [sæt]	сидеть
sleep [sli:p]	slept [slept]	slept [slept]	спать
slide [slaɪd]	slid [slaɪd]	slid [slaɪd]	скользить
speak [spi:k]	spoke [spəʊk]	spoken ['spəʊkn]	говорить, разговаривать
spend [spend]	spent [spent]	spent [spent]	тратить; проводить (время)
spoil [spɔɪl]	spoiled [spɔɪld] spoilt [spɔɪlt]	spoiled [spɔɪld] spoilt [spɔɪlt]	портить
spread [spred]	spread [spred]	spread [spred]	растягивать; расправить; распространять(ся)
spring [sprɪŋ]	sprang [spræŋ]	sprung [sprʌŋ]	прыгать; пружинить
stand [stænd]	stood [stud]	stood [stud]	стоять; держаться; поставить
steal [sti:l]	stole [stəʊl]	stolen ['stəʊlən]	красть, похищать; красться
strike [straɪk]	struck [strʌk]	stricken ['strikn] struck [strʌk]	ударять, поражать

Infinitive	Past Simple	Participle II	Значения
swim [swɪm]	swam [swæm]	swum [swʌm]	плавать
swing [swɪŋ]	swung [swʌŋ]	swung [swʌŋ]	качаться, колебаться
take [teɪk]	took [tʊk]	taken [ˈteɪkən]	брать; принимать
teach [ti:tʃ]	taught [tɔ:t]	taught [tɔ:t]	учить; преподавать
tear [tɛə]	tore [tɔ:]	torn [tɔ:n]	разрывать
tell [tel]	told [təʊld]	told [təʊld]	сказать, сообщать, рассказывать
think [θɪŋk]	thought [θɔ:t]	thought [θɔ:t]	думать, полагать
throw [θrəʊ]	threw [θru:]	thrown [θrəʊn]	бросить, кидать
wake [weɪk]	woke [wəʊk]	woken [ˈwəʊkən] waken [ˈweɪkən]	просыпаться; будить
wear [weə]	wore [wɔ:]	worn [wɔ:n]	носить
weep [wi:p]	wept [wept]	wept [wept]	плакать
win [wɪn]	won [wʌn]	won [wʌn]	выигрывать (<i>одерживать победу</i>)
write [raɪt]	wrote [rəʊt]	written [ˈrɪtən]	писать; сочинять

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