

CAD

I. Introductory exercises

Do you know anything about CAD? Try to answer the questions.

1. What is CAD?
2. When did it appear?
3. What is it used for?
4. What are the advantages of CAD over manual drafting?
5. What CAD applications do you know?
6. What application is the most widely used?

Abbreviations

1. CAD Computer-aided design
2. CAM Computer-aided manufacturing
3. CAE Computer-aided engineering
4. MIT Massachusetts Institute of Technology
5. BIM Building information modeling
6. 3D threedimensional

Learn the new words

hardware (n)	['hɑ:dweə]	аппаратное обеспечение
software (n)	['sɔftweə]	программное обеспечение
affordable (adj)	[ə'fɔ:dəbl]	доступный
indispensable (adj)	[,ɪndɪ'spen(t)səbl]	незаменимый
impetus (n)	['ɪmpɪtəs]	импульс, движущая сила
implementation (n)	[,ɪmplɪmen'teɪʃ(ə)n]	внедрение
evolve (v)	[ɪ'vɒlv]	развивать
versatile (adj)	['vɜ:sətaɪl]	гибкий
flexibility (n)	[,fleksɪ'bɪlətɪ]	гибкость, приспособляемость
mediator (n)	['mi:diətə]	промежуточное звено
competitive (adj)	[kəm'petɪtɪv]	соперничающий, конкурентный
rollout (n)		внедрение, выпуск новой продукции
annual (adj)	['ænjʊəl]	ежегодный
prompt (v)	[prɒmpt]	побуждать
proponent (n)	[prə'pəʊnənt]	сторонник
workflow (n)	['wɜ:kfləʊ]	поток операций, рабочий цикл
consumer (n)	[kən'sju:mə]	потребитель

Ex.1 Nouns

Match the nouns on the right to the nouns on the left

1. impetus	a. сторонник
2. implementation	b. вычисление
3. mediator	c. потребитель
4. hardware	d. импульс, движущая сила
5. consumer	e. внедрение
6. workflow	f. промежуточное звено
7. software	g. гибкость
8. calculation	h. аппаратное обеспечение
9. proponent	i. поток операций, рабочий цикл
10. flexibility	j. программное обеспечение

Ex.2 Adjectives

Match the adjectives on the right to the adjectives on the left

1. affordable	a. подходящий, надлежащий
2. indispensable	b. отличительный
3. versatile	c. незаменимый
4. competitive	d. доступный
5. annual	e. удивительный
6. initial	f. достаточный
7. distinctive	g. ежегодный
8. remarkable	h. гибкий
9. suitable	i. соперничающий, конкурентный
10. sufficient	j. первоначальный

Ex.3 Verbs

Match the verbs on the right to the verbs on the left

1. evolve	a) проектировать
2. prompt	b) присоединять

3. carry out	с) расширять
4. interact	д) проводить
5. expand	е) побуждать
6. attach	ф) развивать
7. design	г) уменьшать
8. support	h) определять
9. reduce	и) взаимодействовать
10.define	j) поддерживать

Ex.4 Definitions

Match the definitions on the right to the verbs on the left

1. evolve	a) make smth smaller
2. prompt	b) develop and change gradually
3. carry out	c) say that you agree with an idea
4. interact	d) connect one object to another
5. expand	e) make a drawing or plan of smth that will be made or built
6. attach	f) do smth that you have said you will do or that someone has asked you to do
7. design	g) make someone decide to do smth
8. support	h) affect each other
9. reduce	i) describe smth correctly and thoroughly
10.define	j) become larger in size, number or amount

Learn the word combinations

1. computer-aided design	a) автоматизированное проектирование
2. computer-aided manufacturing	b) автоматизированное производство

3. computer-aided engineering	c) автоматизированные инженерные работы
4. building-information modeling	d) информационное моделирование строительства
5. automotive industry	e) автомобильная промышленность
6. NC programming	f) подготовка управляющей программы для станков с ЧПУ
7. commercial applications	g) применения в промышленном масштабе
8. additional input	h) дополнительный ввод данных
9. machine operations	i) машинные операции
10. cost effective	j) экономичный

Ex.5 Word combinations

Match the items on the right to the items on the left

1. computer-aided design	a) экономичный
2. computer-aided manufacturing	b) автомобильная промышленность
3. computer-aided engineering	c) дополнительный ввод данных
4. building-information modeling	d) подготовка управляющей программы для станков с ЧПУ
5. automotive industry	e) автоматизированное проектирование
6. NC programming	f) автоматизированное производство
7. commercial applications	g) автоматизированные инженерные работы
8. additional input	h) машинные операции
9. machine operations	i) применения в промышленном масштабе
10. cost effective	j) информационное моделирование строительства

II. Reading

Text A Some facts from the history of CAD

Read and translate the text

Designers have used computers for their calculations since the 20th century. Initial developments were carried out in the 1960s within the aircraft and automotive industries in the area of 3D surface construction and NC programming, most of it independent of one another and often not publicly published until much later. It is argued that a turning point was the development of



SKETCHPAD system in MIT in 1963 by Ivan Sutherland. The distinctive feature of SKETCHPAD was that it allowed the designer to interact with his computer graphically: the design can be fed into the computer by drawing on a CRT monitor with a light pen. Effectively, it was a prototype of graphical user interface, an indispensable feature of modern CAD.

First commercial applications of CAD were in large companies in the automotive and aerospace industries, as well as in electronics. Only large corporations could afford the computers capable of performing calculations. As computers became more affordable, the application areas have gradually expanded. The development of CAD software for personal desktop computers was the impetus for almost universal application in all areas of construction.

CAD implementations have evolved dramatically since then. Initially, with 2D in the 1970s, it was typically limited to producing drawings similar to hand-drafted drawings. Advances in programming and computer hardware, notably solid modeling in the 1980s, have allowed more versatile applications of computers in design activities. Key products for 1981 were the solid modeling packages and the release of the surface modeler CATIA. Autodesk was founded in 1982 by John Walker, which led to the 2D system AutoCAD. The next milestone was the release of Pro/ENGINEER in 1988, which heralded greater usage of feature-based modeling methods. This led to the release of mid-range packages such as SolidWorks in 1995, SolidEdge in 1996, and IronCAD in 1998. Today CAD is one of the main tools used in designing products.

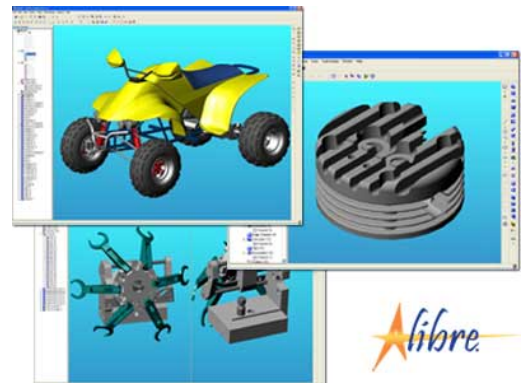
Ex.6 Complete the sentences

- | | |
|--------------------------|---|
| 1. Ivan Sutherland | a. have evolved dramatically since then. |
| 2. CAD implementations | b. developed Sketchpad system in 1963. |
| 3. Key products for 1981 | c. were the solid modeling packages. |
| 4. Then John Walker | d. is one of the main tools used in designing products. |
| 5. The next milestone | e. to the release of SolidWorks in 1995. |
| 6. This led | f. was the release of Pro/Engineer in 1988. |
| 7. Today CAD | g. founded Autodesk. |

Text B CAD today

Read and translate the text

CAD systems are high-speed workstations or desktop computers with CAD software. A graphics tablet is used for drawing, and a scanner may be attached for additional input. The output of a CAD system is either printed or electronically transmitted to a CAM system, which builds the objects. CAD software is available for generic design or specialized uses, such as architectural, electrical and mechanical. CAD software may also be highly specialized for creating products such as printed circuits and integrated circuits.



CAD systems use a computer with terminals featuring video monitors and interactive graphics-input devices to design such things as machine parts, patterns for clothing, or integrated circuits. CAM (computer-aided manufacturing) systems use numerically controlled machine tools and high-performance programmable industrial robots. Drawings developed during the design process are converted directly into instructions for the production machines, thus optimizing consistency between design and finished product, and providing flexibility in altering machine

operations. These two processes are sometimes grouped as CAE (computer-aided engineering).

CAD is widely used in 3D modeling, 2D designing, Mechanical design, Architecture drafting and design. 3D modeling is one of the most happening services from CAD. It is used to provide 3D effect to your structural or architecture product models and makes them look attractive and nice.

In today's competitive world, you should be aware of the latest technologies, especially when you are dealing with services related to CAD it gives remarkable benefit to your business. 3D Design services give a 3D effect to different images. The respective image is going to have depth, height, and width and products are represented as they happen and thus helping you in a great extent to improve your business productivity.

CAD is also used in architecture as an efficient tool for designing all types of buildings. CAD can also be used by consumers in designing and developing various products. It can also be used as a mediator in other products. It is very useful in engineering processes to create conceptual designs and layout analyses of components in manufacturing methods.

Ex.7 Decide what sentences are true

1. CAD systems are high-speed workstations or desktop computers with CAD software.

True

False

2. The output of a CAD system can only be printed.

True

False

3. CAD software is available only for generic design.

True

False

4. CAM systems use numerically controlled machine tools and high-performance programmable industrial robots.

True

False

5. Drawings developed during the design process can't be converted directly into instructions for the production machines.

True

False

6. 3D modeling is one of the most happening services from CAD.

True

False

7. 3D Design services give a 3D effect to different images.

True

False

8. CAD can't be used in architecture as an efficient tool for designing all types of buildings.

True

False

9. In today's competitive world you should be aware of the latest technologies.

True

False

10. Using 3D an image can have only depth and height but not width.

True

False

Text C

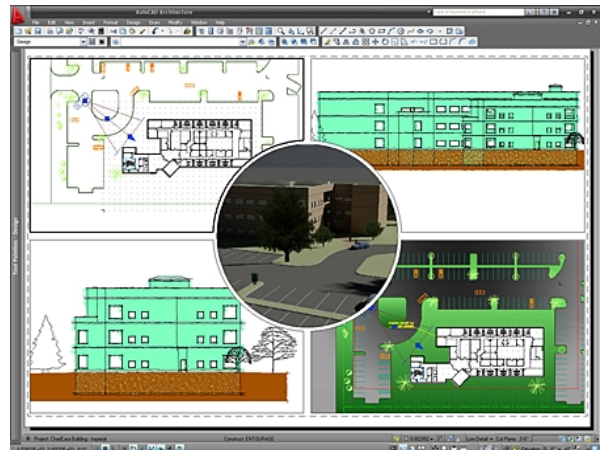
CAD Enough?

Read and translate the text

Many companies could increase their productivity by implementing the latest versions of software and supporting this with suitable training. For most companies a managed CAD rollout with a centralised configuration is a key to increasing productivity and providing high quality standardised data. Companies with a clear technology plan know how to manage and implement change on an annual basis. This is what makes them cost effective; gaining those percentage increases in productivity year on year. Change is happening and whilst many UK companies are happy to continue using traditional CAD, it is noticeable that US organisations working in the UK markets are converting to BIM technologies.

Building information modeling (BIM) technology is a technique that uses digital information to create more accurate project models and construction schedules, helping developers and others to reduce expenses, including the number of costly mistakes.

The new BIM technology is even prompting many participants in a construction project to ditch long-held habits, such as putting designs on paper and then tediously transferring them to a computer. Now the designs can be created electronically, and everyone can see them simultaneously. Proponents say BIM removes some of the uncertainty about how a building will look and operate once it's completed.



BIM allows you to perform a complete simulation of any building. You can vary the elements and factors that might impinge on that performance. Materials, ceiling heights, fenestration and roofing can all be changed, measured and explored before construction takes place. So, BIM is worth considering if you work on high-value schemes involving substantial amounts of design co-ordination and revision.

Training; resources; content creation; along with team working and new workflows all need to be managed. Change won't happen overnight, however having a clear strategy along with the correct guidance will enable this process. Once a technology plan has been produced - then the issue of implementation comes. A shortage of skills in BIM technologies is a common problem, even causing many companies difficulties when trying to implement basic CAD software correctly.

There will be many who fail to define an appropriate strategy or do not have the skill sets to follow it through, but for those that do, the long term prospects appear beneficial. BIM technologies are here to stay. In conclusion, most companies could increase their productivity by making better use of their traditional CAD solutions.

Ex.8 Word Combinations

Match the items on the right to the items on the left

- | | |
|--|--------------------------------------|
| 1. высокоскоростные рабочие станции | convert directly into instructions |
| 2. программное обеспечение САПР | programmable industrial robots |
| 3. дополнительный ввод данных | numerically controlled machine tools |
| 4. выходные данные | capable of performing calculations |
| 5. эффективное средство | digital information |
| 6. данные в цифровом виде | an efficient tool |
| 7. способные выполнять вычисления | output |
| 8. станки с ЧПУ | additional input |
| 9. программируемые промышленные роботы | CAD software |
| 10. преобразовывать в инструкции | high-speed workstations |

Ex.9 Answer the questions

1. What was a turning point in CAD history?
2. What was the distinctive feature of Scetchpad system?
3. Where were first commercial applications of CAD?
4. What are CAD systems?
5. Where is CAD used?

6. What things can be designed using CAD systems?
7. Can CAD be used in architecture?
8. What is Building information modeling technology?
9. What are the main advantages of BIM?
10. What is a common problem concerning BIM technology?

Ex.10 Match the questions to the answers

A.

1. What was a turning point in CAD history?
2. What was the distinctive feature of Scetchpad system?
3. Where were first commercial applications of CAD?
4. What are CAD systems?
5. Where is CAD used?
6. What things can be designed using CAD systems?
7. Can CAD be used in architecture?
8. What is Building information modeling technology?
9. What are the main advantages of BIM?
10. What is a common problem concerning BIM technology?

B.

- a. The problem is a shortage of skills in BIM technology.
- b. It helps to create designs electronically and everyone can see them simultaneously.
- c. BIM is a technique that uses digital information to create accurate project models and construction schedules.
- d. Yes, it can be used as an efficient tool for designing different types of buildings.
- e. Machine parts, patterns for clothing, integrated circuits etc can be designed.
- f. It is widely used in 3D modeling, 2D designing, Mechanical design etc.
- g. CAD systems are high-speed workstations or desktop computers with CAD software.
- h. First commercial applications were in the automotive, aerospace industries and electronics.
- i. The distinctive feature was that it allowed the designer to interact with his computer graphically.

- j. A turning point was the development of Scetchpad system in 1963.

Ex.11 Complete the sentences

A.

1. Initial developments were carried out in the 1960s.....
2. It is argued that a turning point.....
3. At first only large corporations.....
4. As computers became more affordable,
5. Advances in programming and computer hardware, notably solid modeling in the 1980s,.....
6. Today CAD is one of the main tools.....
7. CAD software is available for generic design or specialized uses,.....
8. CAD software may also be highly specialized.....
9. CAD systems.....
- 10.CAD is very useful in engineering processes to create conceptual designs...

B.

- a. and layout analyses of components in manufacturing methods.
- b. use a computer with terminals featuring video monitors and interactive graphics-input devices to design such things as machine parts, patterns for clothing, or integrated circuits.
- c. for creating products such as printed circuits and integrated circuits.
- d. such as architectural, electrical and mechanical.
- e. used in designing products.
- f. within the aircraft and automotive industries in the area of 3D surface construction and NC programming.
- g. was the development of SKETCHPAD system in MIT in 1963 by Ivan Sutherland.

- h. could afford the computers capable of performing calculations.
- i. the application areas have gradually expanded.
- j. have allowed more versatile applications of computers in design activities.

Ex.12 Fill in the gaps

*calculations, automotive, applications, CAM, input, desktop, workstations,
software, output, affordable*

CAD systems are high-speed (1) or (2) computers with CAD (3) A graphics tablet is used for drawing, and a scanner may be attached for additional (4)..... The (5) of a CAD system is either printed or electronically transmitted to a (6) system, which builds the objects.

First commercial (7) of CAD were in large companies in the (8) and aerospace industries, as well as in electronics. Only large corporations could afford the computers capable of performing (9)..... . As computers became more (10), the application areas have gradually expanded.

III. Language practice

Ex.13 Translate from Russian into English

1. Первые применения САПР в промышленном масштабе были в автомобильной, космической и электронной промышленности.
2. Только большие корпорации могли позволить себе компьютеры, способные выполнять вычисления.
3. Когда компьютеры стали более доступными, область применения САПР расширилась.
4. САПР – это высокоскоростные рабочие станции с программным обеспечением САПР.
5. Для дополнительного ввода данных может использоваться сканер.

6. Выходные данные САПР печатаются или передаются в электронном виде в систему автоматизированного производства.
7. Системы автоматизированного производства используют станки с ЧПУ и программируемые промышленные роботы.
8. Чертежи, создаваемые во время процесса проектирования, преобразуются в машинные инструкции.
9. САПР широко используются в трехмерном моделировании и двухмерном проектировании.
10. САПР также широко используются в архитектуре как эффективное средство проектирования любых зданий.

Ex.14 Make a short report based on these sentences

1. Designers have used computers for
2. Initial developments were carried out in the 1960s.....
3. First commercial applications of CAD were.....
4. Only large corporations could afford
5. As computers became more affordable,
6. The development of CAD software for personal desktop computers was
7. Advances in programming and computer hardware have allowed
8. Autodesk was founded in 1982.....
9. The next milestone was.....
10. Today CAD is

Ex.15 Text D

Listen to the text and answer the questions

1. What is this text about?
2. What is AutoCAD?
3. When was AutoCAD 2011 issued?
4. What is the main feature of AutoCAD 2011?
5. What are the advantages of AutoCAD?
6. Who uses AutoCAD?

Ex.16 Decide what sentences are true

1. Today AutoCAD is a designed tool, a drawing tool, a modeling tool, and a database manager.

True

False

2. The things that AutoCAD designs are limited.

True

False

3. AutoCAD 2011 was issued in 2009.

True

False

4. One new feature of AutoCAD 2011 is the free-form modeling.

True

False

5. AutoCAD has few advantages over drawings by hand.

True

False

6. AutoCAD can help to generate data from linework that we would always have to import by hand.

True

False

7. But you can't share these data with others.

True

False

8. CAD is an acronym for computer-aided drawings.

True

- False
9. Only engineers and architects use AutoCAD.
True
False
10. Textile designers and movie makers can use it.
True
False

Script 1 Text D AutoCAD

Today AutoCAD is a designed tool, a drawing tool, a modelling tool, and a database manager. The data manager can be in many different forms: raw data, points, lines, images and more. The things AutoCAD designs (drawings and models) are limitless. AutoCAD 2011 is the 25th release of AutoCAD and it was issued in March of 2010. It added minimum features to AutoCAD abilities.

One new feature is the free-form modeling and surface modeling. Another major addition is the parametric design instruments. These two topics are beyond the scope of this tutorial. They are much more advanced and used on purpose. We may mention them from time to time.

AutoCAD has many advantages to drawing things by hand. Many of the advantages it gives you due to the nature of digital design and to using computers. The data in the drawing files are more easily added and repeated. AutoCAD can help to generate data from linework that we would always have to import by hand. It also links us to data from multiple sources and can share these data with others. These are the reasons we use CAD. It allows us to do more because we have less to do. After all, CAD is an acronym for computer-aided design. What can we make with AutoCAD? Anything that needs to be constructed, modified, developed or illustrated. It's not just for engineers or architects, though these groups are the most common users of AutoCAD. But textile designers use it, servers use it, even movie makers use it. There are too many users for AutoCAD to list them all.

Text E

Vocabulary and definitions

1. malware	a computer virus, i.e. a program that has been designed to stop affected computers working properly
2. to be held accountable	here, to take responsibility and be punished
3. not to let this kind of activity go unchecked	here, to make sure that creators of computer viruses are found, monitored and, if necessary, stopped and punished
4. to cause significant pain to	here, to make computers stop working properly and therefore seriously affected (the customers)
5. malicious	intended to harm or upset
6. self-replicating	that can make copies of itself
7. to take advantage of	to make use of, affect
8. security patches	programs specially created by computer companies to protect their product from viruses
9. to slither through easily	to move around
10. hardening	here, making more difficult to guess

Ex.17 Text E

Listen to the text and answer the questions

1. What is this text about?
2. When was the malicious program discovered?
3. How many computers have been affected by it?
4. What is the Conficker worm?
5. How can it infect machines?
6. What do security specialists recommend?

Script2

Text E

Microsoft offers reward for bug creator

Microsoft says people who write this **malware** have **to be held accountable** and know the company **will not let this kind of activity go unchecked**. George Stathakapoulos, the general manager of its trustworthy computing group, says "our message is very clear - whoever wrote this **caused significant pain to** our customers and we are sending a message that we will do everything we can to help with your arrest".

Since the **malicious** program was discovered in October 2008, it's estimated that as many as 12 million computers have been affected globally. The Conficker worm is a **self-replicating** program that **takes advantage of** networks or computers that have not kept up to date with Windows **security patches**. It can infect machines from the internet or by hiding on USB memory sticks, carrying data from one computer to another. The worm **slithers through** networks by guessing usernames and passwords.

Security specialists recommend **hardening** passwords by mixing in numbers, punctuation marks and upper case letters.

IV. Making a presentation

This morning I'd like to talk about

The report is concerned with ...

The purpose of my report is to(explain...)

My presentation consists of ... (three parts)

First, I'd like to...

Then I'll focus on..

After that we'll deal with... (the technical aspects)

Now let's move on to... (the next part...)

I'd like to attract your attention to...

I'd like to draw your attention to...

I'd like to emphasize the fact that...

I think, you are entirely right...

I would object just a little...

I have doubts about...

It is worth mentioning the fact that...

Let us have a closer look at...

I can tell you without any exaggeration...

I won't to go into details...

This diagram shows...

Actually, I don't know...

If you look at this graph you can see...

In conclusion let me ...

In closing (conclusion), I'd like to mention very briefly..

Are there any questions?

Could you be more specific about...?

In addition, I would like to mention...

That brings me to the end of my presentation (report)...

Since I am running out of time...

I'd like to express my gratitude to...

Linking devices

Types	Examples
<i>Additive linkers</i> (giving additional information)	Furthermore к тому же, кроме того Moreover более того In addition кроме того Besides кроме того Along with наряду с
<i>Adversative linkers</i> (introducing information which contrasts with what has been stated previously)	Yet однако However однако, тем не менее Nevertheless тем не менее On the other hand с одной стороны
<i>Comparative linkers:</i> a) Expressing similarity; b) Expressing difference	a) In comparison по сравнению By analogy аналогично Similarly так же, подобным образом b) While в то время как Whereas тогда как As opposed to в отличие In contrast (to) в противоположность On the contrary напротив

<i>Concessive linkers</i> (to concede a point contradicting the main argument of a sentence)	Although Though Despite ... In spite of ...	хотя хотя, несмотря на несмотря на не смотря на
<i>Causal linkers:</i> introducing the result of previous information	Consequently As a result Therefore Hence Thus For this reason	следовательно в результате поэтому следовательно таким образом по этой причине
<i>Concluding linkers:</i> a) At the end of a series of facts or comments; b) at the end of the text	a) In brief b) In summary To sum up In conclusion To conclude	короче говоря подводя итог подводя итог в заключение в заключение

References

1. Агабебян И. П. Английский для технических вузов. – Ростов н/Д: Феникс, 2000.
2. Англо-русский политехнический словарь / Авт.-сост. М.В. Адамчик. — Минск: Харвест, 2004.
3. Иванова Л.И., Усманов Д.А. «Космические летательные аппараты и ракеты-носители» М: МГТУ им. Баумана, 2010.
4. Климзо Б.Н. Ремесло технического переводчика: Об английском языке, переводе и переводчиках научно-технической литературы. — 2-е изд., перераб. и доп. — М.: Р. Валент, 2006.
5. Colins Dictionary. - 2nd ed. – Glasgow: Harper Collins Publishers, 2000.
6. www.articlesbase.com
7. www.caduser.com
8. www.en.wikipedia.org
9. www.bbc.co.uk
10. www.softwaretrainingtutorials.com