



Министерство образования Республики Беларусь  
БЕЛОРУССКИЙ НАЦИОНАЛЬНЫЙ ТЕХНИЧЕСКИЙ  
УНИВЕРСИТЕТ

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Кафедра английского языка № 1

И.Ю. Кипнис  
Ю.В. Безнис  
С.А. Хоменко

ENGLISH  
FOR  
COMPUTER SCIENCE STUDENTS  
АНГЛИЙСКИЙ ЯЗЫК ДЛЯ СТУДЕНТОВ,  
ИЗУЧАЮЩИХ КОМПЬЮТЕРНЫЕ  
ТЕХНОЛОГИИ

Пособие по английскому языку

Минск 2009

Министерство образования Республики Беларусь  
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English  
for  
Computer Science Students

Английский язык для студентов,  
изучающих компьютерные технологии

Пособие по английскому языку  
для студентов I курса машиностроительного факультета  
специальностей 1-55 01 01 «Интеллектуальные приборы, машины  
и производства» и 1-55 01 02 «Интегральные сенсорные системы»

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К 42

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зав. кафедрой английского языка № 2 БНТУ *Н.Е. Денисенко*

**Кипнис, И.Ю.**

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Пособие рассчитано на 60–66 часов аудиторных занятий и состоит из 9 уроков, включающих аутентичные тексты, учебный словарь, предтекстовые и послетекстовые задания и краткий грамматический справочник.

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# Unit 1

## History of Computers

### Section A The alphabet, telephone numbers, money and dates

A. You are phoning someone in England. It's a bad line and they can't hear you very well. They ask you to spell:

- your name
- your company's name
- your address

Then they ask you for your telephone numbers (home and work).

#### Alphabet pronunciation

1. Which letters rhyme with *A*?
2. Which letters rhyme with *B*?
3. Which letters start with the sound [*e f*]?

These letters are commonly confused. Make sure you know them.

A E G H I J Q R U Y

B. Someone is querying some invoices. Give them the information on the list below.

e.g. invoice number thirteen, dated December the seventeenth nineteen eighty seven, is for five hundred and twenty six pounds, seventeen pence

<i>Invoice №</i>	<i>Date</i>	<i>Amount</i>
013	December 17 <sup>th</sup> 1987	£ 526.17
106	12 <sup>th</sup> July 1999	£ 214.95
119	Aug. 30 <sup>th</sup> 2004	\$ 1,387.86
286	21.11.07	€ 2,406.05

### Section B Language Focus. To be. There is / are

I. Put the following sentences into interrogative and negative forms:

- a) Computer technology is a fast growing discipline.
- b) They were in the computer class last Monday.

II. Insert the correct personal forms of the verb *to be*:

1. I ... specialized in integrated sensor systems but my friend ... fond of intelligent systems.

2. Mathematics ... my favourite subject but the knowledge of computers ... very important today.
3. In a year my brother ... a programmer.
4. Programs ... not hardware as they have no electrical or mechanical components.
5. In 1956 transistors ... invented.

**III. Ask as many special questions as you can:**

1. All the operations of the ALU are under the direction of the control unit.
2. A fourth-generation language is a software facility designed to speed up application development.
3. Many of Babbage's ideas were the basis for building today's computers.

**IV. Explain the function of the verb *to be* in the following sentences. Translate the sentences into Russian:**

1. Second generation computers were smaller than first generation ones.
2. The adding machine was built by B. Pascal in 1642.
3. Modern computers are of three types: analog, digital and hybrid.
4. They were working in the computer centre all the evening yesterday.
5. The program is still under development.
6. The students are to work in the computer class every Monday.
7. The goal of my graduation paper is to create a simple network for a small business.

**V. Change the following sentences into interrogative and negative forms:**

1. There are four computer classes at our faculty.
3. There was a minicomputer on the desk of my friend.

**VI. Fill in *is, are*:**

1. There ... many laboratories in our University.
2. ... there any printer in the computer room?
3. There ... three general types of a computer: analog, digital and hybrid.
4. There ... something on the screen.
5. ... there any interesting article about the central processor?
6. There ... a lot of educational opportunities for those who are interested in pursuing computer careers.

**VII. Form the sentences using:**

1. there is/are ... (a colour monitor, some operators, 15 terminals, a computer centre, a laser printer);

2. there was/were ... (an interesting lecture, computer companies, few computers, ink-jet printer, video terminals).

**VIII. Translate the following sentences into Russian:**

1. There are many input devices of different types.
2. There are two main categories of hardware: processors and peripherals.
3. There is no better way to understand computer than through interacting with one.
4. There are keyboards with different number of keys nowadays.
5. There are two types of software: system and applications.
6. There is a long history of research at IBM on the theory of databases.
7. There are a number of (there is a lot of) different types of terminals.

**Section C Reading**

- I. A modern computer has a long history of development. Do you happen to know who is considered to be the father of the computer? Scan paragraph 4 to prove your idea.
- II. Study the following words and word combinations and make sure you know their translations. Use a specialized dictionary in case of any difficulties.

binary numbers  
to devise  
to subtract  
to multiply  
methods of difference  
punched card  
automatic loom

- III. Symbols for 4 main arithmetic operations are well-known to everyone. Match the notions with their symbols.

- |                               |                   |
|-------------------------------|-------------------|
| <input type="checkbox"/> 1. + | a. subtraction    |
| <input type="checkbox"/> 2. - | b. multiplication |
| <input type="checkbox"/> 3. ÷ | c. addition       |
| <input type="checkbox"/> 4. × | d. division       |

- IV. State the type of word-building of the following words and translate them into Russian.

necessarily, mathematician, calculator, automatically, to displace, successor, indifference

V. Read the text attentively and name the main stages in the development of computing devices.

*Binary code*

The idea that number systems do not necessarily have to be based on 10 is not a recent one. Gottfried Leibniz, working in the 1600s, developed theories of logic and binary numbers. A century later, George Boole, a British mathematician, devised a branch of logic that is still applied to binary systems in computing.

*Calculators*

The principle of the abacus was first translated into a mechanical calculator in 1642 by the great French scientist Blaise Pascal. Numbers were fed into his machine by turning dials similar to those on a telephone, and the result appeared in a window. The machine added or subtracted numbers with total accuracy, but was a financial flop.

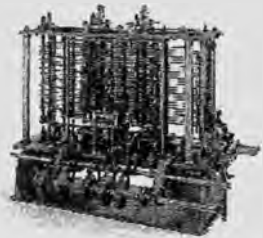


In 1694, Gottfried Leibniz in Germany improved the mechanical calculator so that it could also multiply and divide. He devised a way of making it automatically perform repeated additions or subtractions. Mechanical calculators then advanced rapidly over the following two centuries, until they were gradually displaced by much faster electronic calculators from the late 1950s and on.



*Mechanical computers*

Early calculators only did arithmetic; unlike a computer they could not store results and they could not be given instructions. However, the idea that such a machine could be built occurred to the British inventor Charles Babbage. The idea came to his mind in 1833, an idea which earned him the title of 'father of the computer'. Babbage at that time was working on a machine called the Difference Engine capable of accurate calculation of logarithms using the method of differences. He wanted to make a successor that could be programmed to perform different kinds of calculations and that could store results. The machine was called the Analytic Engine. It was to be given instructions on punched cards like those used in automatic looms. But it was not completed.



## VI. Main idea

**Which statement or statements best express the main idea of the text?  
Why did you eliminate the other choices?**

- 1. It was Charles Babbage who built the first computer.
- 2. The idea of a mechanical calculator came to Pascal's mind spontaneously.
- 3. Computers as we know them today have gone through many stages.
- 4. Computers have had a very short history.

## VII. Understanding the passage

**Decide whether the following statements are true or false (T/F) by referring to the information in the text. Then make the necessary changes so that the false statements become true.**

- | T                        | F                        |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Gottfried Leibniz, an English mathematician, developed a theory of binary numbers.                                      |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Mechanical calculator that could add and subtract numbers was devised in the 17 <sup>th</sup> century by Blaise Pascal. |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. The first mechanical calculator performed operations with high precision but was a complete failure in terms of money.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. In 1694 Pascal improved his invention by making it automatic.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Early calculators couldn't store the results of the performed operations and couldn't be given instructions.            |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. The machine, the Analytic Engine, invented by Charles Babbage was given instructions on punched cards.                  |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Babbage never realized his desires, but his ideas were the basis for building today's computers.                        |

## VIII. Locating information

**Find the passages in the text where the following ideas are expressed. Give the line reference.**

- ..... 1. The first mechanical calculator could perform only two arithmetic operations.
- ..... 2. Some branches of logic devised even several centuries ago are still used in modern computing.
- ..... 3. A successor of the Difference Engine was supposed to be programmed and to store information.
- ..... 4. Pascal used a telephone principle to feed numbers into his machine.
- ..... 5. In the 17<sup>th</sup> century Gottfried Leibniz perfected the mechanical calculator by adding two more arithmetic operations.



### IX. Contextual reference

Look back at the text and find out what the words in bold typeface refer to.

1. ... is not a recent **one** (1. 2) .....
2. ... similar to **those** on a telephone (1. 9) .....
3. ... of making **it** automatically perform (1. 15) .....
4. ... came to **his** mind (1. 23) .....
5. ... **it** was not completed (1. 35) .....

### X. Understanding words

Refer back to the text and find synonyms for the following words.

1. to use (1. 5) .....
2. alike (1. 9) .....
3. to perfect (1. 13) .....
4. to invent (1. 14) .....
5. to finish (1. 35) .....

Now refer back to the text and find antonyms for the following words.

6. old (1. 2) .....
7. different (1. 9) .....
8. success (1. 12) .....
9. slowly (1. 16) .....
10. predecessor, forerunner (1. 29) .....

### XI. Word forms

Choose the appropriate word to complete the sentences. Make sure you use the correct form.

1. calculation, calculate, calculating, calculated, calculator, calculable, calculus
  - a. A computer can do many kinds of ... quickly and accurately.
  - b. ... is a branch of mathematics for making ... without the use of a ... machine.
  - c. A computer can ... numbers much faster than a manual ... .
  - d. Some problems aren't ... without logarithm tables.
2. necessity, necessitate, necessary, necessarily, necessities, need, needed
  - a. Because it is expensive to set up a computer department it is ... to budget well for the basic ... of the installations.
  - b. A good programmer isn't ... going to be a good system analyst.
  - c. Students' lack of understanding of the basic concepts in computer science may ... the instructor to restructure the course.
3. addition, add, added, additional, additionally, additive
  - a. Many terminals can be ... to a basic system if the need arises.
  - b. ... and subtraction are two basic mathematical operations.

c. When buying a system there is often no ... charge for the programs.

4. accuracy, accurate, accurately

a. A computer is always ... in its results if well prepared.

b. ... is one of the advantages of using computers in research or in statistical analysis.

c. Computers can produce results quickly and ... .

## XII. Content review

a. Match the following words in column A with the statements in column B.

**A**

- 1. theory
- 2. calculator
- 3. abacus
- 4. telephone
- 5. logarithm

**B**

- a. a wooden frame with small balls used for counting
- b. a mathematical function
- c. a general idea about some fact
- d. a piece of equipment for making calls
- e. an electronic machine for doing calculations

b. Use the information in the text to complete the following table.

Time	Event
the 1600s	
the 1700s	
	Blaise Pascal produced a mechanical machine ...
1694	
	Charles Babbage was working on the Difference Engine ...
1833	

XIII. Using a dictionary translate paragraph 4 into Russian.

## Unit 2

### History of Computers

(continuation)

#### Section A Dealing with numbers

##### A. How should these population figures be spoken?

Europe	498,414,000
Greece	10,041,000
France	55,971,000
Ireland	3,522,000
Italy	57,531,000

##### A. *Decimals* are indicated by a *point*

*Numbers after decimals* are spoken separately, e.g. 45.73

*forty-five point seven three*

A *zero following a decimal point* is spoken as *O (oh)*, the same as the letter of the alphabet, e.g. 3.05 *three point oh five*

*Percentages (%)* are spoken like this: *sixty-seven percent (67%)*

##### Read the following text:

In 1991 the population of Belgium was 2.9% of the total European Community, and the unified Germany's was 22.9%. France had a lower population of 16.3%, and Ireland's was quite small – only 1%. Britain's population was similar to that of France – 16.7%

##### B. *Fractions* are spoken like this:

$\frac{1}{2}$	a half	$\frac{2}{3}$	two thirds
$\frac{1}{3}$	a third	$\frac{5}{8}$	five eighths
$\frac{1}{4}$	a quarter	$\frac{3}{4}$	three quarters

##### *Mathematical symbols* are read like this:

$3+8$	three plus eight
$17-6$	seventeen minus six
$8 \times 4$	eight times four
$6 \div 3$	six divided by three
$3+7=10$	three plus seven equals ten
$A > B$	A is   more   than B
	greater
$C < B$	C is   less   than B
	smaller

**Say (or write out) the following mathematical expressions**

- a.  $95 \div 6$       b.  $17 \times 18$       c.  $86 - 17$       d.  $12 + 346$   
e.  $P < Q$       f.  $K > G$

**Read these sums out**

e.g.  $2 + 2 \div 2 \times 2 - 2 = 2$

*Two plus two divided by two times two minus two equals two*

$12 + 6 \div 9 \times 10 - 2 = 18$

$\frac{3}{4} + \frac{1}{2} - \frac{2}{3} = \frac{7}{12}$

$4.12 \div 2 = 2.06$

$75 + 15\% = 86.25$

**Section B Language Focus. To have**

**I. Put the following sentences into interrogative and negative forms:**

- a) Computers have many remarkable powers.
- b) Second generation computers had transistors instead of vacuum tubes.

**II. Insert the correct personal forms of the verb *to have*:**

1. He ... a laboratory class in the computer class yesterday.
2. The introduction of terminals and screens ... partly replaced the use of punched cards.
3. The first computers ... thousands of separate electrical components connected together with wires.
4. Programs are not hardware as they ... no electrical or mechanical components.
5. The students ... a seminar on informatics in two days.
6. Most computers, whether large or small ... three basic capabilities.

**III. Ask as many special questions as you can:**

1. Computers have circuits for performing arithmetic operations, such as addition, subtraction, division, multiplication and exponentiation.
2. Integrated circuits of third generation computers had about 200 components on a single chip.
3. By the 1960s semiconductors had replaced vacuum tubes.

**IV. State the function of the verb *to have* in the following sentences:**

1. Not all computers have the same type of memory.
2. Second generation computers were smaller than first generation ones.
3. The programmer has to write instructions.

4. Step-by-step (пошаговый) procedures had to be specified in detail.
5. Early computers had a capacity of around 80,000 bits.
6. The integrated circuitry of a microcomputer has been reduced to a chip.

**V. Say in English:**

1. Центральный процессор имеет связь со всеми блоками компьютера.
2. Сколько раз в неделю у вас занятия в компьютерном классе?
3. У тебя много книг по информатике?
4. Вчера у нас не было семинара.
5. У этого компьютера два дисководов.
6. Сколько дисководов у этого компьютера?
7. У нас двадцать компьютеров с цветными мониторами.

**Section C Reading**

- I. Study the following words and word combinations and make sure you know their translations. Use a specialized dictionary in case of any difficulties.**

valve  
vacuum tube  
cog  
lever  
chip  
glowing filament  
alternating current  
direct current  
to amplify  
integrated circuit

- II. State the type of word-building of the following words and translate them into Russian.**

invention, pressure, microchip, development, unreliable, impossible, semiconductor

- III. Computers were devised thanks to the development of the devices that produce and process electrical signals. Put the following devices in the order of their chronological invention. Look through the text to prove your order.**

integrated circuit; cog; semiconductor; electronic valve; transistor; vacuum tube; microchip

- IV. Skim paragraph 4 and name two main discoveries in the field of modern computers.
- V. Read the text attentively and make a list of people who contributed greatly to the development of computers.

### *Electronic computers*

The electronic computer, like many inventions, was called in by the pressure of war. It was built on Babbage's principles but used electronic valves or vacuum tubes instead of cogs and levers. The first computer, called colossus, was built in Britain in 1943 to break German codes.

Colossus was in fact only used for code-cracking, and the first general-purpose computer was ENIAC, an American machine completed in 1946. ENIAC was hot and huge, with 19,000 valves. Computers only got smaller with the invention of the transistors and the microchip.

### *Diodes, transistors and microchips*

Electronics really goes back to the turn of the century, when the first devices that could produce and process electric signals were invented. There were electronic valves or vacuum tubes in which a beam of electrons produced by a glowing filament carried a current between electrodes. The diode valve came first, invented by the British scientist John Ambrose Fleming in 1904, followed in America by Lee de Forest's three-electrode mode valve in 1906. The diode changed alternating current to a direct-current signal, and the mode amplified a signal. These valves were crucial to the development of radio and television, and sound recording.



However, valves were large and unreliable as the filament sooner or later burned out, making the development of small electronic machines impossible. The solution was found in 1948 by American scientists William Shockley, John Bardeen and Walter Brattain, who worked at the Bell Telephone Laboratories. Their research led to two great discoveries in the field of electronic – the semiconductor diode and transistors. Pieces of semiconductor replaced the filament and electrodes, and made electronic components small and fully reliable.

The next important development was to fabricate several components in a single piece of semiconductor – the integrated circuit. This was invented by the American engineer Jack Kilby in 1958 and it led to the microchip, into which many thousands of components are packed. The first microchip was produced in 1970.



**vi. main idea**

**Which statement or statements best express the main idea of the text?  
Why did you eliminate the other choices?**

- 1. Only W. Shockley, I. Bardeen and W. Brattain made the invention of present-day computer possible.
- 2. World War II was the reason for the invention of the electronic computer.
- 3. A series of great and important discoveries in the field of electronic led to the appearance of the first microchip – the main component of present-day computer.
- 4. 1946 is the year in which the first general-purpose computer ENIAC was completed.

**VII. Understanding the passage**

**Decide whether the following statements are true or false (T/F) by referring to the information in the text. Then make the necessary changes so that the false statements become true.**

T F

- 1. Babbage's ideas were put into the basis of the first electronic computer.
- 2. Colossus was the first general-purpose computer.
- 3. The invention of electronic valves dates back to the end of the 20<sup>th</sup> century.
- 4. Valves were not reliable as the filament sooner or later burned out and electronic machines were impossible to operate.
- 5. Later the filament and electrodes were replaced by integrated circuits.
- 6. Only one integrated circuit can be put on a chip in today's computers.
- 7. The invention of the diode valve was very important to the development of radio, television and sound recording.

**VIII. Locating information**

**Find the passages in the text where the following ideas are expressed.  
Give the line reference.**

- ..... 1. During the same period in history, the diode valve and three-electrode mode valve were developed.
- ..... 2. Integrated circuitry has further changed computers.
- ..... 3. The invention of electronic valves opened a new page in the history of electronics.
- ..... 4. Two main discoveries in the field of electronics belong to American scientists.
- ..... 5. Colossus was a one-purpose computer.
- ..... 6. Today's computers have more circuits than previous computers.

## IX. Contextual reference

Look back at the text and find out what the words in bold typeface refer to.

1. ... **it** was built on Babbage's (l. 2) .....  
principles...
2. ... in **which** a beam of electrons... (l. 12) .....
3. ... **their** research led to... (l. 25) .....
4. ... **this** was invented by ... (l. 31) .....
5. ... and **it** led to microchip... (l. 33) .....

## X. Understanding words

Refer back to the text and find synonyms for the following words.

1. to crack (l. 4) .....
2. large (l. 7) .....
3. investigation (l. 25) .....
4. branch (l. 26) .....
5. to produce (l. 30) .....

Now refer back to the text and find antonyms for the following words.

6. single-purpose (l. 6) .....
7. beginning (l. 9) .....
8. to follow (l. 15) .....
9. large (l. 21) .....
10. to lose (l. 23) .....

## XI. Word forms

Choose the appropriate word to complete the sentences. Make sure you use the correct form.

1. reliably, rely on, reliable, reliability
  - a. Computers are ... machines.
  - b. If you don't know the meaning of a computer term, you cannot always ... an all-purpose dictionary for the answer.
  - c. Computers can do mathematical operation quickly and ... .
2. integration, integrate, integrated, integrating
  - a. Some computer manufacturers have ... both input and output devices into one terminal.
  - b. The success of any computer system depends on the ... of all its parts to form a useful whole.
  - c. ... input and output devices into one peripheral has reduced the area needed for a computer installation.



3. change, changeable, changeably, changing
  - a. Computer personnel often have to take refresher courses in the ... field of computer science.
  - b. Many... have taken place in the computer industry in the last decade.
  - c. Memory and primary storage can be used inter-... .
  
4. generality, generalize, general, generally
  - a. ...-purpose computers are larger than minicomputers.
  - b. It is the ... consensus of opinion that computers have improved the quality of life.
  - c. Minicomputers are ... cheaper than mainframes.
  - d. It is often easier to ... than to talk about specifics.

## XII. Content review

a. Match the following words in column A with the statements in column B.

- | A                                       | B  |
|---|--|
| <input type="checkbox"/> 1. valve       | a. a device that controls the flow of electricity                        |
| <input type="checkbox"/> 2. vacuum tube | b. one of the two points at which electricity enters or leaves a battery |
| <input type="checkbox"/> 3. transistor  | c. a tube to control the flow of electricity                             |
| <input type="checkbox"/> 4. chip        | d. a flow of electricity   |
| <input type="checkbox"/> 5. electron    | e. a small piece of matter in an atom                                    |
| <input type="checkbox"/> 6. electrode   | f. electronic valve  |
| <input type="checkbox"/> 7. current     | g. a silicon piece used to store and process information in computers    |

b. Use the information in the text to complete the following table.

Time	Event
the beginning of the 20 <sup>th</sup> century	
	A computer Colossus using ... was built.
1946	
1948	

	The invention of the integrated circuit
--	---

XIII. Translate paragraphs 4 and 5 into Russian after checking the unknown words in the dictionary.

## Unit 3

### Types of Computers

#### Section A Comparisons

##### *Comparing two things*

*X is ... -er than Y*

*X is more ... than Y*

*X is less than Y*

*X isn't as ... as Y*

##### *Comparing three or more things*

*X is the ... -est*

*X is the most ...*

*X is the least ...*

#### A. Better and best

##### 1. Compare

- an abacus with a pocket calculator
- your car with your teacher's car
- two different ways of investing money

2. Consider the points below, and then give your opinion. Say which you think is better.

##### *Calculating machines*

size

speed

weight

portability

efficiency

ease of use

age

reliability

##### *Cars*

size

age

price

power

running costs

comfort

boot size

engine size

speed

acceleration

### 3. Compare

- three different forms of transport
- three different jobs
- your country with two other countries

4. Consider the points below, and then give your opinion. Say which you think is best.

#### *Transport*

price  
speed  
comfort  
interest  
noise  
convenience

#### *Jobs*

interest  
stress  
difficulty  
hours of work  
pay  
satisfaction  
training

#### *Countries*

size  
population  
climate  
scenery  
standard of living  
culture  
food

## Section B Language Focus. The Passive Voice

I. Study the models of the passive constructions and translate the sentences into Russian:

### A.

1. Computers are used nowadays for many different kinds of work, e.g. in offices, banks, factories, hospitals, universities and schools.
2. In computers of the 1950's the transistors, diodes, resistors and other components were mounted on printed-circuit cards.
3. The speed and capacity of these components have been greatly improved with each new generation of computers.
4. The conference will be held next week.
5. Is the program being loaded now?
6. Many books on the computer's architecture had been translated into Russian by the end of last year.

### B.

1. In the early 1960's a wholly new technology was created by semiconductor makers.
2. The power of Central Processing Unit (CPU) is partly determined by its speed.
3. He is often asked to make a report at conferences.
4. They were shown new computer classes.
5. The newest electronic memory systems will be much spoken about.
6. The conductor is acted upon by an electric field.
7. The results of his numerous experiments are often referred to.
8. That design was soon followed by many others.

9. In the 1960's advances in microelectronic components were followed by an even smaller microcomputer.
10. The development of computers was greatly influenced by the invention of transistors.

**II. Use the following sentences in the negative and interrogative forms:**

1. The results of computations were recorded in the form of tables.
2. Computers are divided into three main types depending on their size and power.
3. The instructions in the user's program are examined by the Control Unit.
4. The program will be written in three days.
5. Minicomputers have been made possible by the development of integrated circuits.

**III. Ask special questions:**

1. The concept of the stored program was worked out by John von Neuman in 1945.
2. Almost every profession is deeply affected by the computer revolution.
3. A permanent storage of both data and programs is provided by storage devices.
4. His book on programming languages will be translated into English and German.

**IV. Paraphrase the following sentences using the Passive Voice. Give two variants if possible:**

1. The famous Russian scientist M.V. Lomonosov compiled a lot of calculating tables.
2. Storage devices provide a permanent storage of both data and programs.
3. W. Oughtred constructed the first slide-ruler in 1630.
4. They have shown us new computer classes.
5. They explained him how to solve this problem.

**V. Open the brackets. Use the proper form of the verb:**

1. A new model of the printer (to be shown) tomorrow.
2. The concept of the stored program (to be worked out) by J. Neuman in 1945.
3. The constituent parts of the computer (to be called) hardware.
4. A new program (to be compiled) when you called.

5. Your information (to be sent) by e-mail now.
6. Microcomputers (to be applied) since the 1970s.
7. In the first generation, the central processor (to be built) from electronic valves which were rather unreliable.

**VI. Make up sentences using the Passive Voice:**

1. The mouse – to design – to slide – around – your – desktop.
2. The first – transistors – to use – 1959.
3. The information – to store – already – registers.
4. Calculating tables – to compile – next week.
5. The problems – artificial intelligence – to discuss – widely – all over the world.
6. Minicomputers – usually – to find – banks – offices.

**VII. Translate into English:**

1. Данная статья была написана в прошлом месяце.
2. Арифмометр был изобретен П.Л. Чебышевым в 1882 году.
3. Сейчас в нашей лаборатории проводится интересный эксперимент. Я думаю, что он будет закончен к концу недели.
4. Сегодня много говорят о лазерных принтерах.
5. Эту информацию представляют с помощью бинарной системы.
6. В каком году был разработан Бейсик?
7. Когда будет переведена эта статья?

**Section C Reading**

- I. **Nowadays our lives can't be imagined without computers. What is a computer? Give your own explanation and compare your definition with the one given in paragraph 1.**
- II. **Skim the text and name three general types of computers.**
- III. **Study the following words and word combinations and make sure you know their translations. Use a specialized dictionary in case of any difficulties.**

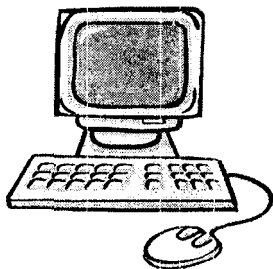
to process data  
sequence of instructions  
discrete form  
digit  
binary code  
to store instructions  
to perform a task  
to utilize

IV. State the type of word-building of the following words and translate them into Russian.

computer, various, unlike, to rearrange, conversion, representation, to misunderstand, continuously

V. Read the text attentively and learn the advantages and disadvantages of 3 computer types.

*Computer* is any of various automatic electronic devices that solve problems by processing data according to a prescribed sequence of instructions. Such devices are of three general types: analog, digital and hybrid. They differ from one another in terms of operating principle, equipment design, and application.



Unlike the *analog computer*, which operates on continuous variables, the *digital computer* works with data in discrete form -- i.e. expressed directly as the digits of the binary code. It counts, lists, compares, and rearranges these binary digits, or bits, of data in accordance with very detailed program instructions stored within its memory. The results of these arithmetic and logic operations are translated into characters, numbers, and symbols that can be easily understood by the human operator or into signals intelligible to a machine controlled by the computer. Digital computers can be programmed to perform a host of varied tasks.

The *hybrid computer* combines the characteristics and advantages of analog and digital systems; it offers greater precision than the former and more control capability than the latter. Equipped with special conversion devices, it utilizes both analog and discrete representation of data. In recent years hybrid systems have been used in simulation studies of nuclear-power plants, guided-missile systems, and spacecraft, in which a close representation of a dynamic system is essential.

VI. Main idea

Which statement or statements best express the main idea of the text? Why did you eliminate the other choices?

- 1. The digital computer is the most efficient one.
- 2. Computers differ from one another in terms of operating principles.
- 3. All computers have the same basic components.
- 4. The hybrid computer is the easiest to operate.

## VII. Understanding the passage

Decide whether the following statements are true or false (T/F) by referring to the information in the text. Then make the necessary changes so that the false statements become true.

- | T                        | F                        |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Three general types of computers differ from one another only in equipment design.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. The basic job of computers is the processing of information.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. The digital computer gets its name because the data represented to it are made up of a digit code.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. The results of arithmetic and logic operations performed by digital computers require further processing by an operator.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. The hybrid computer combines the operating principle of the digital computer and equipment design of the analog one.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Computers can be defined as devices which accept information in the form of instructions, perform various operations and then supply the results of these operations. |

## VIII. Locating information

Find the passages in the text where the following ideas are expressed. Give the line reference.

- ..... 1. The hybrid computer is a combination of both digital and analog computers.
- ..... 2. Computers use special instructions to solve problems.
- ..... 3. Analog and digital computers have different operating principles.
- ..... 4. In recent years hybrid systems have become widely used in military industry.
- ..... 5. The results of the operations performed by digital computers can be used by people without any further processing.

## IX. Contextual reference

Look back at the text and find out what the words in bold typeface refer to.

- |  |               |
|--|---------------|
| 1. ... <b>that</b> solve problems ...              | (l. 2) .....  |
| 2. ... <b>It</b> counts, lists, compares ...       | (l. 11) ..... |
| 3. ... within <b>its</b> memory ...                | (l. 13) ..... |
| 4. ... <b>the former</b> ... <b>the latter</b> ... | (l. 20) ..... |
| 5. ... <b>it</b> utilizes data ...                 | (l. 22) ..... |

## X. Understanding words

Refer back to the text and find synonyms for the following words.

- |                 |         |       |
|-----------------|---------|-------|
| 1. kind         | (1. 5)  | ..... |
| 2. usage        | (1. 8)  | ..... |
| 3. to save      | (1. 13) | ..... |
| 4. to carry out | (1. 18) | ..... |
| 5. different    | (1. 18) | ..... |

Now refer back to the text and find antonyms for the following words.

- |                     |         |       |
|---------------------|---------|-------|
| 6. like             | (1. 9)  | ..... |
| 7. constant         | (1. 10) | ..... |
| 8. incomprehensible | (1. 16) | ..... |
| 9. drawback         | (1. 19) | ..... |
| 10. general         | (1. 21) | ..... |

## XI. Word forms

Choose the appropriate word to complete the sentences. Make sure to use the correct form.

- operation, operate, operator, operating
  - A computer can perform mathematical ... very quickly.
  - One of the first people to note that the computer is malfunctioning is the computer ... .
  - The job of a computer ... is to ... the various machines in a computer installation.
  - The new machines in the computer installation are not yet ... .
- solution, solve, solvable, solver
  - It may take a lot of time to find a ... to a complex problem in programming.
  - A computer can ... a problem faster than any human being.
  - A computer has often been referred to as a problem ... .
- comparison, compare, comparable, comparatively, comparative
  - Renting a computer isn't ... to owning one.
  - Computers can ... numbers.
  - There is sometimes very little ... to be made between two different brand-name microcomputers.
  - The difference in price of microcomputers from different manufactures can be ... small.



## XII. Content review

a. Match the following words in column A with the statements in column B.

- | A                                       | B   |
|---|---|
| <input type="checkbox"/> 1. digit       | a. a letter, mark or sign                                     |
| <input type="checkbox"/> 2. program     | b. facts or details that tell you something about a situation |
| <input type="checkbox"/> 3. information | c. one of the written signs that represent the number 0 to 9  |
| <input type="checkbox"/> 4. device      | d. a group of related parts working together                  |
| <input type="checkbox"/> 5. application | e. a set of instructions given to a computer                  |
| <input type="checkbox"/> 6. character   | f. practical purpose for which a machine can be used          |
| <input type="checkbox"/> 7. system      | g. a piece of equipment for a particular purpose              |

b. Complete the following statements with appropriate words from the box. (Some can be used more than once.) Make sure you use the correct form, i.e. singular or plural.

program	digit	data
digital	continuous variable	computer
device	information	analog
operation	hybrid	

... can be defined as ... which accept ... in the form of instructions called a ... and characters called ..., perform mathematical and logical ... on the information, and then supply results of these ... .

... can be of 3 types: ..., ... and ... . The ... gets its name because the ... that are presented to it are made up of a code consisting of ... . The ... operates on ... . The ... system is a computer which has combined the features of both the ... and ... computers. It is used mainly in scientific research.

XIII. Translate paragraph 2 into Russian after checking the unknown words in the dictionary.

# Unit 4 Computer Memory

## Section A Time management

Think about your typical working day.

### 1. How long do you spend:

- talking to people?
- on the phone?
- working on your own?
- working with a computer?
- travelling?

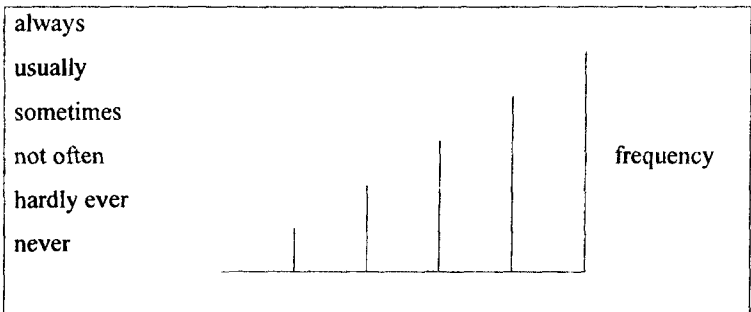
### 2. How often do you:

- work overtime?
- use English at work?
- travel abroad on business?
- have a holiday?
- entertain customers?

➤ a lot of	time
➤ not much	
➤ around	half my time
➤ about	
➤ less than	an hour   a   day
➤ more than	two hours     week

➤ every	day
➤ once	a week
➤ twice	fortnight
➤ three times	month
	year

3. What time do you start work in the morning?
4. And when do you finish?
5. How do you get to work?
6. How long does it take?
7. What do you do to relax in the evening?



## Section B Language Focus. Modal Verbs and Their Equivalents

### I. Change the following sentences into interrogative and negative forms:

1. Computers can process a large volume of data in a short period of time.
2. Every teacher must learn how to select computer programs.
3. A student may go on to the next question if his answer is correct.
4. They should process the results of the experiment.
5. You have to study two computer languages.
6. He is to speak at the conference on computer technology.

### II. Give the modal verb in the following sentences in the Past and Future Simple (add the adverbials if necessary):

1. We can interact with the computer by using many other specialized input devices.
2. Students must know how to solve this problem.
3. You should know programming for your research work.
4. They may work in the computer centre on Mondays.
5. To model the universe we have to create another one.
6. The data is to be transmitted as pulses of light.

### III. Ask as many special questions as you can:

1. The first automatic computers could operate at a low speed.
2. Different combinations of 1s and 0s may be used to represent numbers and characters.
3. The microcomputer has to communicate with the outside world.
4. The memory board of a new powerful computer produced by IBM can easily pass through the eye of a needle.
5. He must use a computer in the classroom to make his work more interesting.

### IV. Fill in the missing modal verbs or their equivalents:

1. Modern specialists ... know the latest computer technology.
2. No man ... do 500 000 sums per second, but a modern computer ...
3. A program is a set of instructions written in a special computer language, telling the computer what operations and processes ... to be carried out and in what order they ... be done.
4. When ... you give your lecture on computer languages? – I ... to do it next week. Now I am very busy. I ... process the results of the experiment.
5. In order to make a good report on data communication systems you ... to sit for many hours in the library.

**V. Translate into Russian paying attention to modal verbs followed by the Infinitive Passive:**

1. Data, however, is the particular information that has to be processed by the computer.
2. A computer can be made more powerful by connecting a second processor to work in parallel with the first one.
3. In the early 1960's several of integrated circuits could be mounted on a single printed card.
4. The computer must be programmed to accept data in any or all of the media.
5. The data may be stored or it may be sorted according to a plan desired by the programmer.
6. The culmination of all the advancements was the microprocessor, which has become virtually synonymous with microelectronics, but should not be confused with it.

**Section C Reading**

- I. A computer consists of a number of components. How do we call a component used to save data and programs? Look through paragraph 1 to prove your idea.
- II. Skim paragraph 2 and name all storing units of the computer system.
- III. Study the following words and word combinations and make sure you know their translations. Use a specialized dictionary in case of any difficulties.

on a temporary / permanent basis  
to retain information  
storage cell  
to conduct  
to detect  
auxiliary  
storage unit  
input / output unit  
semiconductor  
very-large-scale integration (VLSI) circuitry  
storage capacity  
volatile  
power supply

IV. State the type of word-building of the following words and translate them into Russian.

numerous, storage, nonconducting, nonresistive, extensively, compactness, microelectronic

V. Using the English-Russian dictionary write out the translation of the following English abbreviations.

asf; abl; dct; e.c; e.g; et al; i.e; etc

VI. Read the text attentively and name the operating principle of the computer memory.

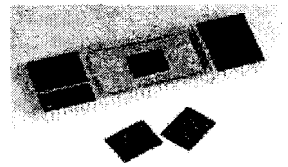
*Computer memory* is a physical device that is used to store such information as data or programs (sequences of instructions) on a temporary or permanent basis for use in an electronic digital computer. The memory of a typical



digital computer retains information of this sort in the form of digit 0 and 1 of the binary code. It contains numerous individual storage cells, each of which is capable of holding one such binary digit (or "bit") when placed in either of two stable electronic, magnetic, or physical states corresponding to 0 and 1. The main memories of digital computers usually operate by means of transistor circuits. In these electronic circuits, binary digits are represented by means of electric charge — on or off, closed or open, conducting or nonconducting, resistive or nonresistive — that can be held, detected, and charged for purposes of storing or manipulating the data represented by the digits.

Most digital computer systems have two levels of memory — the main memory and one or more auxiliary storage units. Besides the main memory, other units of the computer (e.g., the control unit, arithmetic-logic unit (ALU), and input / output units) also use transistor circuits to store electronic signals.

The flow of electric current through the transistors in memory units is controlled by semiconductor materials. Semiconductor memories utilizing very-large-scale integration (VLSI) circuitry are extensively used in all digital computers because of their low cost and compactness. Composed of one



or more silicon chips only about a quarter of an inch in size, they contain several million microelectronic circuits, each of which stores a binary digit. Semiconductor memories provide great storage capacity but are volatile, — i.e. they lose their contents if the power supply is cut off.

## VII. Main idea

Which statement or statements best express the main idea of the text?  
Why did you eliminate the other choices?

- 1. Main memory is more important than auxiliary storage units.
- 2. Memories of digital computers use transistor circuits of various types.
- 3. Semiconductor materials are applied to control electric current flow.

## VII. Understanding the passage

Decide whether the following statements are true or false (T/F) by referring to the information in the text. Then make the necessary changes so that the false statements become true.

- |                          |                          |  |
|--------------------------|--------------------------|--|
| T                        | F                        |  |
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Semiconductor memories aren't very popular because they are very expensive.                           |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Computer memory stores information in the form of generally-accepted characters: letters and numbers. |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Semiconductor memories can store larger volumes of information.                                       |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Computer memory stores only programs for their further usage.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Main units of the computer use special convention devices to store electronic signals                 |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Semiconductor memories depend on electricity.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Most computer systems have one memory unit.   |

## IX. Locating information

Find the passages in the text where the following ideas are expressed.  
Give the line reference.

- ..... 1. The operating principle of the main memories in digital computers.
- ..... 2. There are two types of memories in computer systems.
- ..... 3. Semiconductor materials are widely used in transistors.
- ..... 4. Information is stored in memory on different basis.
- ..... 5. Semiconductor memories have a number of advantages.

## X. Contextual reference

Look back at the text and find out what the words in bold typeface refer to.

- |  |               |
|--|---------------|
| 1. ... information of <b>this</b> sort...        | (l. 5) .....  |
| 2. ... <b>it</b> contains numerous individual... | (l. 6) .....  |
| 3. ... <b>that</b> can be held...                | (l. 13) ..... |
| 4. ... because of <b>their</b> low cost...       | (l. 26) ..... |
| 5. ... <b>they</b> contain...                    | (l. 28) ..... |
| 6. ... each of <b>which</b> stores...            | (l. 29) ..... |
| 7. ... <b>they</b> lose <b>their</b> contents... | (l. 31) ..... |

## XI. Understanding words

Refer back to the text and find synonyms for the following words.

- |             |         |       |
|-------------|---------|-------|
| 1. constant | (l. 3)  | ..... |
| 2. kind     | (l. 5)  | ..... |
| 3. to store | (l. 5)  | ..... |
| 4. to use   | (l. 24) | ..... |
| 5. volume   | (l. 30) | ..... |

Now refer back to the text and find antonyms for the following words.

- |             |         |       |
|-------------|---------|-------|
| 6. constant | (l. 3)  | ..... |
| 1. neither  | (l. 8)  | ..... |
| 2. main     | (l. 17) | ..... |
| 3. high     | (l. 27) | ..... |
| 10. to keep | (l. 31) | ..... |

## XII. Word forms

Choose the appropriate word to complete the sentences. Make sure to use the correct form.

- power, powerful, powerfully, powerless, powered
  - There are many ways of producing ... .
  - Battery ... calculators occupy less space than their predecessors.
  - A computer is a very ... machine.
  - Computers are rendered ... if there isn't an emergency supply system in case of power failure.
- logic, logical, logically
  - To be a good programmer one must be ... in one's approach to a problem.
  - The ... operations performed by the arithmetic-logical unit are under the control of the control unit.
  - A program must be ... organized if successful results are to be obtained.
- computer, compute, computerized, computed, computation
  - The banking industry has become more and more ... .
  - It is a fact that humans cannot ... as fast as ... .
  - The ... requirements necessary to produce the payroll for a large company take a very long time.

4. provision, provide, provided, provider
- A programmer must ... the computer with the necessary data and instructions to execute the problem.
  - The ... of a new and larger computer installation will result in a better service to customers.
  - A programmer can operate a computer ... he has the proper training.

## XII. Content review

a. Match the following words in column A with the statements in column B.

- | A  | B  |
|--|--|
| <input type="checkbox"/> 1. storage cell     | a. information or facts  |
| <input type="checkbox"/> 2. inch             | b. a small piece of equipment for storing                      |
| <input type="checkbox"/> 3. electric charge  | c. an electric force   |
| <input type="checkbox"/> 4. data             | d. space for storing things                                    |
| <input type="checkbox"/> 5. unit             | e. a substance that allows electric current to pass through it |
| <input type="checkbox"/> 6. semiconductor    | f. a measuring unit equal to 2.54 cm                           |
| <input type="checkbox"/> 7. storage capacity | g. a piece of machinery which is a part of a larger machine    |

b. Complete the following statements with appropriate words from the box. (Some can be used more than once.) Make sure you use the correct form, i.e. singular or plural.

silicon	information	storing	storage capacity
state	bit	development	integrated circuit
characteristic	memory	process	wire
power	lost	semiconductor memory	

One of the most important ... of a computer is its capability of ... information in its ... long enough to ... it.

The memory of the first computers was made up of a kind of network of vertical and horizontal ... . At each intersection where the ... crossed there was a core. Each core represented a binary digit of either 0 or 1, depending on its ... . Early computers had a ... of around 80,000 bits.

In the 1970s there was a further ... in the computer field. This was the ability to place thousands of ... onto a tiny piece (chip) of ... . Each circuit is capable of ... one bit. Because of the very small size of the chip such ... are very popular, however when ... is removed, ... in the memory is ... .

XIV. Check all the unknown words from paragraph 3 in your dictionary and translate it into Russian.



# Unit 5

## Main Memory

### Section A Advantages and disadvantages. Job definition

#### A. Advantages and disadvantages

1. What are the advantages and disadvantages of your job? Give your job a score from 0 (very bad) to 5 (very good) on the chart below.

	score (0-5)
interesting work	
length of holidays	
flexibility of working hours	
salary or wages	
fringe benefits	
job security	
level of stress	
level of job satisfaction	
level of control over the work organization	
pleasant working environment	
relationships with colleagues	

2. Which of the factors above are most important for you?

3. What qualities do you need to do your job successfully?

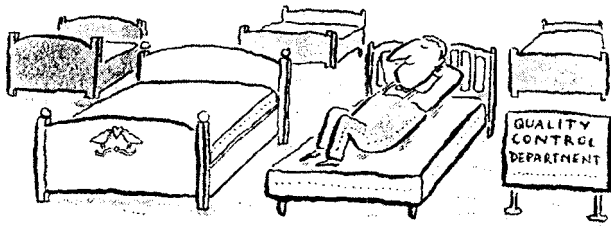
4. What information would you include in an advert for your job?

- One good thing about my job is ...
- Another is ...
- The bad thing about it is ...
- I like ...
- I don't like ...
- I'd like ...
- I wouldn't like ...

#### B. Job definition

Outline your job definition. Make rough notes first. Explain:

- what you are responsible for
- how your performance is measured
- where you have the authority to change things



### C. Self study: Easily confused words

**Make a list of the words you used to outline your job definition, e.g. check, control, organize, supervise, maintain, repair. Make sure you know the difference between words with similar meanings. A good dictionary will help you.**

**These words are often confused. Do you know how to use them?**

check / control	financial / economic	raise / rise
deliver / despatch	say / tell	advertise / announce
enquire / query	maintain / repair	safety / security
training / education	lend / borrow	notice / note
miss / lose	remember / remind	

## Section B Language Focus. Simple Tenses

### Present Simple

#### i. Put the verbs in brackets in the correct form of Present Simple:

- Computers (to process) the data and (to give) the results of the processing in a specified format as information.
- A standard computer system (to consist) of three main sections: the Central Processing unit, the main memory and the peripherals.
- The control unit (to examine) the instructions in the user's program.
- The peripherals (to include) storage devices and input/output devices.
- Input devices (to enable) data to go into the computer's memory.
- The Central Processing Unit (to execute) programs and (to coordinate) the activities of all the other units.

#### ii. Put the following sentences into interrogative and negative forms:

- The control unit controls all the other units in the computer system.
- Input devices allow us to enter information into the computer.
- We interact with computers by entering instructions and data into them.
- A scanner converts text or pictures into electronic codes.

**III. Make questions to the underlined words:**

1. To operate a joystick, the user grips and moves a vertical lever.
2. Storage devices provide a permanent storage of both data and programs.
3. Output devices enable us to extract the finished product from the system.
4. Computers do 500 000 sums per second.
5. He spends much time in the library to make a report.
6. The students work in the computer class every day.

**IV. Say in English:**

1. Как компьютер помогает людям?
2. Моя сестра не преподает информатику, она учится в университете на факультете “Компьютерные системы и сети”.
3. Студенты принимают активное участие в научно-исследовательской работе.
4. Как часто вы проводите научные конференции?
5. Что включает в себя дисциплина “Вычислительная техника” (computer science)?
6. Мы не применяем этот метод в решении таких задач.
7. Где находят применение мини-компьютеры?
8. Это устройство не декодирует команды программ.

### Past Simple

**I. Put the verbs in the Past Simple Tense. Mind the reading of -ed ending:**

to use, to process, to record, to stop, to store, to design

**II. Give the forms of Past Simple of the following verbs:**

to read, to write, to make, to build, to send, to keep, to put, to know

**III. Express agreement using “You are right”:**

1. Computers began to use transistors in 1955.
2. The third generation of computers used integrated circuits.
3. In the early 1960’s semiconductor makers created a new technology.
4. In 1945 Dr. Neuman worked out the concept of the stored program.
5. Ch. Babbage designed his Analytical Engine to perform four arithmetic operations.

**IV. Change the following sentences into interrogative and negative forms:**

1. The student made an interesting report on the problems of storage capacity.
2. He studied five programming languages.

3. At his last lecture the professor spoke about the invention of computers.
4. Early computers used magnetic cores in their main memory.
5. Two major developments occurred in the late 1940's: the construction of programmable electronic computers and the invention of the transistor.

**V. Ask for the additional information:**

1. Last month they carried out many experiments.
2. B. Pascal invented the first mechanical adding machine.
3. Last year he studied such programming languages as PASCAL and C.
4. They attended this professor's lectures.
5. It took me much time to write a report.

**VI. Put the verbs in brackets in the correct form of Past Simple:**

1. Ch. Babbage and Lady Lovelace, Lord Byron's daughter, (to work out) a coded program. Lady Lovelace (to be) a brilliant mathematician. She (to believe) and fully (to understand) the potentialities of the Analytical Engine. She (to take) an active part in Babbage's experiments. So it is fair to say that she (to be) the world's first computer programmer.
2. About seventy years (to pass) before the production of the first digital computer, similar to Babbage's Analytical Engine. ▲
3. The use of transistors instead of vacuum tubes (to make) these computers smaller, more powerful and more reliable.

**VII. Translate into English:**

1. Лейбниц изобрел первую вычислительную машину, которая выполняла умножение.
2. Как часто вы работали в дисплей-классе в прошлом году?
3. Первый электронный компьютер весил около 30 тонн.
4. Кто создал первую логарифмическую линейку.
5. Когда Айкен начал работать над первым полностью автоматическим цифровым компьютером?
6. Использование кремниевых чипов вместо транзисторов привело к изобретению микрокомпьютеров в 70х годах 20 века.
7. Документ включал описание памяти, сохраняемой программами.
8. Эд Робертс мечтал снабдить обычного человека машиной, способной выполнять его приказы.

## Future Simple

### I. Express agreement using *"You are right"*:

1. Next generation computers will use natural languages and a speech input.
2. They will store and process knowledge.
3. This electronic translator will help us to study foreign languages.
4. We shall attend the lecture on microprocessors next Monday.
5. In future computers will have optical devices.

### II. Express disagreement using *"I am afraid you are mistaken"*:

1. We shall study the theory of programming next term.
2. At the next seminar we shall discuss the invention of the first electronic computer.
3. They will compile the program next week.
4. He will study such programming languages as PASCAL and C.
5. This student will make an interesting report on the problems of storage capacity.

### III. Change the following sentences into interrogative:

1. This supercomputer will perform 10 billion operations per second.
2. In future machines will solve many problems which today are in competence of man.
3. This microcomputer will ideally answer the aims of education.

### IV. Ask as many special questions as you can:

1. It will take me about three weeks to write a report on the latest computer languages.
2. At his next lecture the professor will speak about input devices.
3. By the end of this decade exceptionally faster and smaller computers will replace those in use today.

### V. Read the sentences, mind the tense and the conjunctions of subordinate clauses. Translate the sentences:

1. You will find it difficult to communicate with a computer unless you have more practice.
2. When he gets a book "Microcomputer Design", he will give it to you.
3. We shall not hold the conference until our scientific supervisor comes back from London.
4. If you change the method of your experiment you will get different results.

**VI. Put the verbs in brackets in the correct tense:**

1. I (to discuss) these problems with our system-engineer as soon as I (to see) him.
2. You (to do) a computer provided you (to know) programming.
3. Before he (to carry out) complex calculations he (to learn) how to operate the computer.
4. When we (to complete) our experiment we (to help) you with your experiment.
5. If the voltage between the first pair of terminals (to cause) a change of current between a second pair of terminals then we (to have) an amplifier.

**Section C Reading**

- i. Using your general knowledge name different types of memory units of a computer. Look through paragraph 1 to check your ideas.
- ii. Skim paragraph 2 and name two kinds of main memory and their main differences.
- iii. Study the following words and word combinations and make sure you know their translations. Use a specialized dictionary in case of any difficulties.

main (primary) memory  
secondary memory  
random-access memory (RAM)  
static RAM  
dynamic RAM  
flip-flop  
capacitor  
access time

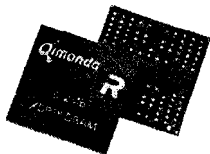
**IV. Using the method of conversion form verbs from the following nouns, check their pronunciation and meaning in the dictionary.**

process	—	base	—
access	—	change	—
input	—	charge	—
output	—	control	—
increase	—	record	—
subject	—		

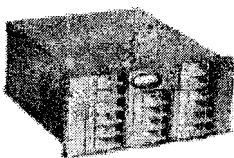
V. Read the text attentively and name the operating principle of the main memory.

The *memory unit* of a digital computer typically has a main (or primary) memory, cache, and secondary (or auxiliary) memory. The main memory holds data and instructions for immediate use by the computer's ALU. It receives this information from an input device or an auxiliary storage unit. In most cases, the main memory is a high-speed random-access memory (RAM) — i.e., a memory in which specific contents can be accessed (read or written) directly in a very short time regardless of the sequence (and hence location) in which they were recorded.

Two types of main memory are possible with random-access circuits — static random-access memory (SRAM) and dynamic random-access memory (DRAM). A single memory chip is made up of several million memory cells. In a SRAM chip, each memory cell consists of a single flip-flop (for storing the binary digits 1 or 0) and a few more transistors (for reading or writing operation). In a DRAM chip, each memory cell consists of a capacitor (rather than a flip-flop) and a single transistor. When a capacitor is electrically charged, it is said to store the binary 1, and when discharged, it represents 0; these changes are controlled by the transistor. Because it has fewer components, DRAM requires a smaller area on a chip than does SRAM, and hence a DRAM chip can have a greater memory capacity, though its access time is slower than that of SRAM.



The *cache* is a SRAM-based memory of small capacity that has faster access time than in the main memory and that temporarily stores data and part of a program for quicker processing by the ALU.



VI. Main idea

Which statement or statements best express the main idea of the text?  
Why did you eliminate the other choices?

- 1. SRAM is more important in the computer memory than DRAM.
- 2. Various types of memory have different access time and thus are used for different purposes.
- 3. Cache memory is the only memory used in modern computers because of its faster access time.
- 4. Speed and random access are important in processing information.

## VII. Understanding the passage

Decide whether the following statements are true or false (T/F) by referring to the information in the text. Then make the necessary changes so that the false statements become true.

T F

- 1. A SRAM chip is made up of a single flip-flop and a single transistor.
- 2. In a digital computer the memory unit consists of several types of memory.
- 3. The sequence of the recorded information is very important in RAM.
- 4. Flip-flop is used mainly for writing operations.
- 5. The transistor in a DRAM chip is responsible for the capacitor operation.
- 6. Cache memory stores data on a permanent basis.
- 7. There are no other differences between DRAM and SRAM except their access time.

## VII. Locating information

Find the passages in the text where the following ideas are expressed. Give the line reference.

- ..... 1. Random-access circuits are used in 2 types of primary memory.
- ..... 2. The cache is a variant of SRAM memory.
- ..... 3. DRAM is more compact than SRAM.
- ..... 4. The time of recording is unimportant in random-access memory.
- ..... 5. Flip-flop and transistors are responsible for different operations.
- ..... 6. The transistor in a DRAM chip is some kind of a controller.

## IX. Contextual reference

Look back at the text and find out what the words in bold typeface refer to.

- 1. ... in which **they** were recorded... (l. 8) .....
- 2. ... **it** represents 0... (l. 20) .....
- 3. ... because **it** has fewer... (l. 21) .....
- 4. ... though **its** access time... (l. 23) .....
- 5. ... slower than **that** of SRAM... (l. 24) .....
- 6. ... and **that** temporarily stores... (l. 27) .....

## X. Understanding words

Refer back to the text and find synonyms for the following words.

- 1. order (l. 8) .....
- 2. to consist (l. 14) .....
- 3. several (l. 16) .....
- 4. to demand (l. 22) .....
- 5. faster (i. 28) .....



**Now refer back to the text and find antonyms for the following words.**

- |                      |         |       |
|----------------------|---------|-------|
| 6. main              | (l. 2)  | ..... |
| 7. output            | (l. 4)  | ..... |
| 8. sequential-access | (l. 6)  | ..... |
| 9. faster            | (l. 24) | ..... |
| 10. permanently      | (l. 27) | ..... |

## **XI. Word forms**

**Choose the appropriate word to complete the sentences. Make sure to use the correct form.**

1. electricity, electric, electrical, electrically
  - a. A lot of ... is needed to operate large computer systems.
  - b. Alexander Graham Bell invented the ... light bulb.
  - c. Many students today are studying to become ... engineers.
2. representation, represent, representative, represented, representing
  - a. In the computer the letters of the alphabet are ... in terms of 0s and 1s.
  - b. The Morse Code is composed of dots and dashes ... the letters of the alphabet and numerals.
  - c. Each column of punched holes on a card ... a letter, a number, or a special character.
  - d. The binary ... of the decimal number 10 is 100.
3. storage, store, stored, storing
  - a. The computer memory is capable of ... a lot of information for a short period of time.
  - b. The recording heads of a tape drive accessed the information which was ... on a tape.
  - c. There are now telephones that can ... up to several hundred numbers in their memory.
4. access, accessible, accessibility, accessed, accessing
  - a. Do you have ... to the students' files in the database?
  - b. To ... information recorded on a disk, a disk drive must be used.
  - c. Tapes were a faster medium than punched cards for ... information.
  - d. A cylinder is ... by all the recording heads acting at once.

## XII. Content review

a. Match the following words in column A with the statements in column B.

- | A   | B   |
|---|---|
| <input type="checkbox"/> 1. capacitor         | a. the information contained in the memory cell               |
| <input type="checkbox"/> 2. random access     | b. a piece of equipment used to collect and store electricity |
| <input type="checkbox"/> 3. contents          | c. means any part of memory can be read equally quickly       |
| <input type="checkbox"/> 4. sequential access | d. time taken by a computer to find and use information       |
| <input type="checkbox"/> 5. access time       | e. information must be read in a fixed pattern                |

b. Complete the following statements with appropriate words from the box. (Some can be used more than once.) Make sure you use the correct form, i.e. singular or plural.

main memory	capacity	random-access memory	▲ internal
semiconductor	memory system	processing	temporarily
information	circuit	central processor	

Cache is an additional ... that ... stores frequently used instructions and data for quicker ... by the ... . Both ... and cache are ..., ... that use ...-based ... . The smaller ... of the cache reduces the time required to locate data within it and provide it to the computer for ... .

When a computer's ... accesses its internal memory, it first checks to see if the ... it needs is stored in the cache. If it is, the cache returns the data to the processor. If the ... isn't in the cache, the processor retrieves it from the ... .

XIII. Using a dictionary translate paragraph 2 into Russian.

## Unit 6

### Nonvolatile Memories

#### Section A Presentations

##### A. Public speaking

1. You are chairing a conference. Make a speech of welcome on the first morning.
2. You are a guest speaker at an English Rotary Club lunch. Introduce yourself and say a little about Rotary Club activities in your country.
3. Introduce the guest speaker at your company's annual dinner and dance, then thank him / her at the end.
4. Think of a situation in which you might be called to speak in public. Explain the situation, then give the speech.

##### *Welcoming*

- Good morning, ladies and gentlemen.
- Welcome to...
- It's very nice to see you all here today.

##### *Introducing a speaker*

- Miss Eustace has kindly agreed to come along today to speak to us about ...
- Ladies and Gentlemen. Miss Caroline Eustace .... (clapping)
- It gives me great pleasure to introduce Miss Caroline Eustace .... (clapping)

##### *Finishing*

- Thank you very much.
- Thank you for being so attentive.

##### *Questions*

- If anyone has any questions, please feel free to interrupt.
- If you have any questions, I'll do my best to answer them (later).

##### *Thanking a speaker*

- On behalf of everyone here, I'd like to thank Miss Eustace for a most interesting and entertaining / enlightening / informative talk.
- Thank you very much indeed Miss Eustace. I'm sure I'm speaking for us all when I say how much we've appreciated your being here today.



(to be continued)

## Section B Language Focus. Continuous Tenses

- I. Give the *present participle* of the following verbs:  
write, use, compile
- II. Give the verb in the following sentences in the Present Continuous (Omit the adverbials "every day, usually, often"):
  1. My friend usually works hard at his English.
  2. The students often discuss the problems of hardware with their teacher.
  3. We work in the computer centre every day.
- III. Answer the question *What are you doing?*:
  1. You are at a lecture on informatics.
  2. You are in the computer room.
  3. You are at an English lesson.
- IV. Give the interrogative and negative forms of the following sentences:
  1. The lecturer is speaking about theories of logic and binary numbers by Leibniz.
  2. We are reading an error message on the screen.
  3. I am typing the name of the program on the keyboard.
  4. He is writing a new program.
- V. Ask special questions:
  1. My friend is working at his term project on informatics.

2. The students in classroom 303 are listening to the lecture on the history of computers.
3. He is sending SMS to his friend in Poland.

**VI. Answer the question "What are you doing tomorrow afternoon?" using the prompts:**

to study my English; to take the test on mathematics; to write the report for the conference; to discuss some problems with the tutor; to listen to a very interesting lecture on the history of computer development....

**VII. Translate into English:**

1. Где профессор Новиков? – Он читает лекцию об аналоговых компьютерах в аудитории 525.
2. Куда ты идешь? – Я иду в библиотеку, хочу взять книги по информатике. В пятницу я сдаю экзамен.
3. Не входите в аудиторию. Студенты пишут там контрольную работу.
4. На какую тему ты пишешь доклад сейчас? – "Аппаратное обеспечение ЭВМ".
5. Я собираюсь выступить на конференции.
6. В следующий вторник я уезжаю в Москву на конференцию.

**VIII. Say what you or other people were doing some time ago. Use the Past Continuous Tense:**

e.g. The whole day yesterday I was busy. I was writing an article.

1. On Sunday I was in the library.
2. At 10.30 a.m. on Friday I was at the University.
3. On Thursday morning I was at work.
4. At 8 o'clock yesterday evening we were still at the office.

**IX. Express agreement using *That's right* or disagreement using *I can't agree with you* or *On the contrary*:**

1. The computer is loading the operational system now.
2. They were solving that algebraic problem all the evening yesterday.
3. He was writing a report on the binary system when we came.
4. He is making a report on data types at the seminar now.
5. From 3 to 5 p.m. yesterday we were discussing computer architecture problems.
6. While Pat was compiling a program Nick was speaking to the chief engineer.

**X. Put the verbs in brackets in the Simple or Continuous tenses:**

1. We (to discuss) the difference between analog and digital computers now.
2. We (to discuss) various problems at the seminars.
3. I (not to write) a new computer program last month.
4. I (to write) a report when the telephone rang.
5. You (to answer) all the questions at the exam?
6. He (to answer) the students' questions at the moment.
7. When I called him he (to compile) a program.

**XI. Translate into English:**

1. Я могу видеть профессора Белова? – К сожалению, нет. Он читает лекцию студентам третьего курса в аудитории 310.
2. Не входите в аудиторию. Студенты сдают там экзамен по программному обеспечению ЭВМ.
3. Что ты делал вчера в читальном зале, когда я зашел туда? – Я писал доклад по аппаратному обеспечению ЭВМ.
4. Вы регулярно читаете литературу по информатике на английском языке? – Да, я стараюсь делать это регулярно. Вот и сейчас я читаю журнал "Computer Press".

**Section C Reading**

- I. **SRAMs and DRAMs are volatile memories. Can you give any examples of non-volatile ones. Look through paragraph 1 to check your ideas.**
- II. **Skim paragraph 2 and name the main advantages of optical disks.**
- III. **Study the following words and word combinations and make sure you know their translations. Use a specialized dictionary in case of any difficulties.**

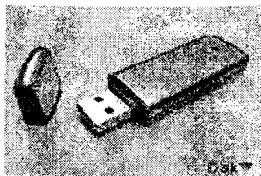
nonvolatile memory  
read-only memory (ROM)  
operating system  
to erase  
to alter  
optical disk

- IV. **State the type of word-building of the following words and translate them into Russian.**

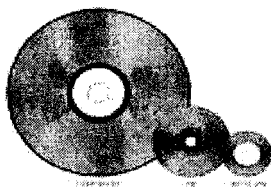
increasingly, respectively, modification, erasable, alterable, time-consuming, gigabyte, information

V. Read the text attentively and name the differences between types of nonvolatile memories.

Besides main and auxiliary memories, other forms of memory exist for specialized purposes. An increasingly important class is that of *nonvolatile memories*, which, unlike SRAMs and DRAMs, do not lose their content when the power supply is cut off. Some nonvolatile memories, such as read-only memory (ROM), are not rewritable once manufactured or written. Each memory cell of a ROM chip either has a transistor or none, representing the binary digit 0 or 1, respectively. ROMs are generally employed for programs designed for repeated use without modification, as, for example, the operating system of a personal microcomputer. By contrast, EPROM (erasable programmable ROM), EAROM (electrically alterable ROM), and flash memory are types of nonvolatile memories that are rewritable, though the writing is far more time-consuming than reading. They are thus used as special-purpose memories where writing is seldom necessary.



Another form of memory is the *optical disk*, which uses optical rather than electrical means for reading and writing. It developed from videodisc technology during the early 1980s. Optical disks have a greater memory capacity than most magnetic disks; the largest ones can store 1.5 gigabytes of information, which is equal to about 700,000 pages of printed material. Optical disks come in sizes ranging from 3.5 to 12 inches (30 cm). They are widely used as auxiliary memory when large memory capacity is required.



VI. **Main idea**

Which statement or statements best express the main idea of the text? Why did you eliminate the other choices?

- 1. Nonvolatile memories are less important than main and auxiliary memories.
- 2. There are several types of nonvolatile memories.
- 3. Optical disks is the only type of auxiliary memory used in computer systems.

## VII. Understanding the passage

Decide whether the following statements are true or false (T/F) by referring to the information in the text. Then make the necessary changes so that the false statements become true.

T F

- 1. Optical disks aren't widely used because of their small memory capacity.
- 2. EPROM and EAROM are employed mainly for writing purposes.
- 3. Nonvolatile memories can keep data and information within a few minutes after the electricity is off.
- 4. Flash memory is a rewritable type of nonvolatile memories.
- 5. Optical disks are manufactured only in one size of 3.5 inches.
- 6. A ROM chip is based on the operating principle of the transistor.
- 7. Nonvolatile memories are usually used for general purposes.

## VII. Locating information

Find the passages in the text where the following ideas are expressed. Give the line reference.

- ..... 1. Storage capacity of optical disks makes them popular among users.
- ..... 2. ROMs are used for long-term keeping of the information and data.
- ..... 3. A ROM chip uses the binary system.
- ..... 4. EPROM and EAROM are mostly used as one-purpose memories.
- ..... 5. Optical disks use operating means different from those used in other disk types.

## IX. Contextual reference

Look back at the text and find out what the words in bold typeface refer to.

- 1. ... do not lose **their** content... (l. 5) .....
- 2. ... **they** are used... (l. 16) .....
- 3. ... **which** uses optical... (l. 19) .....
- 4. ... **it** developed from... (l. 20) .....
- 5. ... the largest **ones** can... (l. 24) .....
- 6. ... **they** are widely used... (l. 26) .....

## X. Understanding words

Refer back to the text and find synonyms for the following words.

- 1. secondary (l. 1) .....
- 2. application (l. 11) .....
- 3. on the contrary (l. 12) .....
- 4. changeable (l. 13) .....
- 5. to demand (l. 28) .....



**Now refer back to the text and find antonyms for the following words.**

- |                    |               |
|--------------------|---------------|
| 6. neither ... nor | (l. 9) .....  |
| 7. general-purpose | (l. 16) ..... |
| 8. often           | (l. 16) ..... |
| 9. late            | (l. 21) ..... |
| 10. small          | (l. 24) ..... |

## **XI. Word forms**

**Choose the appropriate word to complete the sentences. Make sure to use the correct form.**

- repetition, repeat, repetitive, repeatedly, repeating
  - There are some people who ... to arrive late to class whenever they are working on a program because they forget the time.
  - A computer can do ... operations without getting tired or bored.
  - ..., which can be a boring and unproductive task has been eliminated with the use of computers.
  - A computer can ... the same operation over and over again accurately without becoming bored or tired.
- alteration, alter, altered
  - When a program doesn't work properly, it is often necessary to make ... to it.
  - The omission of data from a program can ... its results.
  - The use of the computer in business has ... the workload of many people.
- basis, base, based, basic
  - The binary system is ... on two digits: 0 and 1.
  - The decimal system uses 10 as a ... whereas the hexadecimal system uses 16.
  - Data ... management involves structuring and organizing data so as to make them useful and available to more than one particular user.
  - Flowcharting is a ... step in programming.
- instruction, instruct, instructed, instructor
  - Our math ... explained to us the principles of binary arithmetic.
  - We were ... to document our programs very carefully.
  - Both ... and data have to be changed to machine code before the computer can operate on them.

## XII. Content review

Complete the following statements with appropriate words from the box. (Some can be used more than once.) Make sure you use the correct form, i.e. singular or plural.

drawback	multimedia	magnetic storage	optical disk
information retrieval	capacity	magnetic head	4.72-inch
optical storage	mold	application	memory capacity
recording characteristic			

... provides greater ... than ... because laser beams can be controlled and focused much more precisely than can tiny ... . An entire set of encyclopedias can be stored on a standard 12-centimeter (...) optical disk. ... are also inexpensive to make: the plastic disks are simply ... pressed from a master, as photograph records are.

The main ... of optical equipment is a slower rate of ... compared to conventional magnetic-storage media. Despite its slowness, its superior ... and ... make optical storage ideally suited to memory-intensive ...: graphics, sound, video games, training programs, ... encyclopedias.

XII. Translate paragraph 2 into Russian after checking the unknown words in the dictionary.

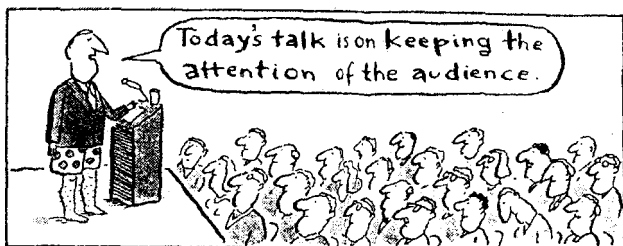
## Unit 7 Types of Disks

### Section A Presentations (continued)

#### B. On the spur of the moment

You have just two minutes to prepare before you give a talk on one of these topics:

- how good presentations can benefit your company
- how speakers should prepare before giving presentations
- the qualities of a good speaker
- how a speaker can keep the attention of the audience
- the effective use of visual aids in presentations



**C. A prepared presentation**

Prepare and make a presentation on a topic of your own choice. For example:

- your company
- your products
- a project you have been involved in recently
- new developments in your field

**Before you begin, decide:**

- who you are talking to
- how many people there are
- who they are
- if it's a formal or informal occasion

**Write brief notes outlining the talk.**

<i>Company Presentation Notes</i>	
1. Who it was founded by .....	.....
2. Date it was founded .....	.....
3. Nature of business .....	.....
4. The type of customers it has .....	.....
5. Location(s) .....	.....
6. Number of employees .....	.....
7. Annual turnover .....	.....
8. Location of headquarters .....	.....
9. Group turnover .....	.....
10. Number of group employees .....	.....
11. The company's main strength .....	.....
12. The company's future plans .....	.....

(to be continued)

## **Section B Language Focus. Perfect Tenses.**

### **Revision of Tenses**

#### **I. Read the sentences and explain the use of Perfect Tenses. Translate the sentences into Russian:**

1. Computers have changed the way in which we live.
2. He will have studied some high-level computer languages by next year.
3. By the 1960's computers had become faster than their predecessors.
4. There are many different types of memory that have been used in computers.

#### **II. Change the following sentences into interrogative and negative forms:**

1. Computers have decreased man's workload.
2. The students had discussed the news by the end of the lesson.
3. He will have finished the work at the term project by the end of November.
4. Today the Internet has entered everyone's house.

#### **III. Rewrite the sentences in *Perfect Tenses* using the appropriate adverbs:**

1. Computers as we know them today are going through many changes.
2. Integrated circuitry will further change computers.
3. In 1969 the Intel Company pioneered in the development of semiconductor memory chips.
4. Computers change the way in which many kinds of jobs are done.
5. The demand for computer professionals steadily rises from year to year.

#### **IV. Ask as many special questions as you can:**

1. Dr. H. Aiken has created the first completely automatic digital computer, Mark I.
2. All the articles on biosensors had been translated by last Friday.
3. The next generation computers will have been produced by the end of 2015.

#### **V. Read and translate the sentences, mind the use of the *Perfect Continuous*:**

1. The printer has been operating for an hour.
2. The demand for computer professionals has been steadily rising.
3. Will she have been writing the report since early morning tomorrow?
4. They have not been producing any information for a few days.
5. She hadn't been translating an English article for half an hour when she was brought the dictionary.
6. He had been studying the computer keyboard for an hour when the telephone rang.

**VI. Choose the correct tense form. Mind the voice of the predicate:**

1. It goes without saying that computers (to create) whole new areas of work ...
2. In the mid 1940's the first digital computer (to build).
3. A hybrid computer (to compile) some properties of digital and analog computers.
4. They (to test) the new system for a week?
5. When I called my friend he (to compile) a program.
6. By the 1960's semiconductors (to replace) vacuum tubes.
7. Microcomputers (to become) the most commonly used type of computers.
8. He (to give) a lecture on information science at 10 o'clock tomorrow.
9. You (to pass) the exam on integrated circuits by 12 o'clock tomorrow?
10. The main memory (to hold) the instructions and data which (to process currently) by the CPU.
11. They (to study) operational systems next term?
12. They (to discuss) different types of printers at 3 o'clock seminar yesterday.
13. She (to read) for her exam on computer languages for 4 hours.
14. It (to forecast), by the end of this decade exceptionally faster and smaller computers (to replace) those in use today.
15. This famous scientist (not to begin) his research in the second half of the 17<sup>th</sup> century.

**VII. Translate the following sentences into English:**

1. Как долго профессор читает лекцию? – Он читает лекцию уже два часа.
2. Что ты будешь делать завтра в 10 часов утра? – Я буду работать над курсовой по операционным системам.
3. Когда вы пришли, компьютер уже загрузил программу.
4. Б. Паскаль построил вычислительную машину в 1642 году в возрасте 19 лет.
5. Персональный компьютер помогает выполнять сложные вычисления, создает большие банки данных, обучает студентов по многим предметам.
6. К 12 часам я сдам экзамен по информатике и буду свободен.
7. Компьютер прекращает работу, если в программе есть ошибка.
8. Что ты читал, когда я видел тебя вчера в читальном зале? – Я готовился к экзамену по языкам программирования.

## Section C Reading

- I. What purpose are CD-ROMs mainly used for? Look through paragraph 1 to prove your idea.
- II. Skim paragraph 2 and describe how the process of writing is performed in magneto-optical disks.
- III. Study the following words and word combinations and make sure you know their translations. Use a specialized dictionary in case of any difficulties.

CD-ROM (compact disk read-only memory)

stamping machine

to track

pit

photocell

reference work

multimedia format

WORM (write-once read-many)

laser beam

- IV. Give the translation of the following abbreviations and translate them into Russian.

ROM, SRAM, VSLI, EAROM, RAM, ALU, DRAM, EPROM

- V. State the type of word-building of the following words and translate them into Russian.

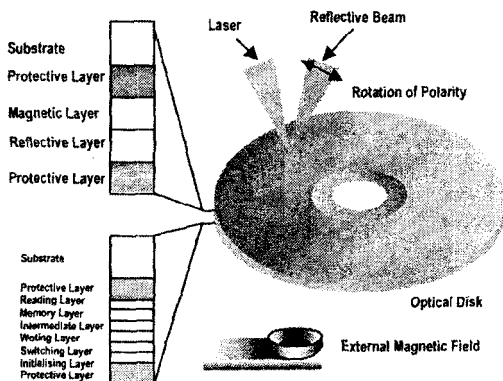
rewritten, digitally, rewritable, relatively, combination, impossible, magnetization

- VI. Read the text attentively and name the differences between optical and magneto-optical disks.



In one type of *optical disk*, the CD-ROM (compact disc read-only memory), digital data is stored as a pattern of tiny pits on a compact disc by the heat of a high-power laser beam or by a stamping machine. Once the information is stored, it can be read but cannot be rewritten. For

5 reading, the digitally coded data are tracked by a low-power optical laser scanner; variations in the intensity of laser light reflected from the pits are detected by a photocell that converts them into electric signals. Because they are not rewritable, CD-ROMs are used to distribute relatively static data, for example in encyclopedias and other reference works, and their large capacity makes them ideal for combinations of text with audio and graphics or other multimedia formats. WORM (write-once read-many) is a variation of CD-ROM that allows a user to write information on each disk only once, with subsequent erasure impossible.



15 In *magneto-optical* disks, which can be erased and rewritten, information is written into or read from the disk by means of the magnetic properties of spots on its surface. In reading, spots with different directions of magnetization give different polarization in the reflected light of a low-power laser beam. In the writing process, which erases all previous information, every spot on the disk is heated by a strong laser beam and is then cooled under a magnetic field. Thus every spot is magnetized in one direction; in other words, every spot stores 0. Then, reversing the direction of the magnetic field, only desired spots are magnetized in the opposite direction by a strong laser beam, storing 1.

## VII. Main idea

Which statement or statements best express the main idea of the text?  
Why did you eliminate the other choices?

- 1. All types of optical disks can only be read but cannot be rewritten.
- 2. Both optical and magneto-optical disks use laser beams in their operating principles.
- 3. CD-ROMs are used for keeping more or less static data.

### VIII. Understanding the passage

Decide whether the following statements are true or false (T/F) by referring to the information in the text. Then make the necessary changes so that the false statements become true.

T F

- 1. Magnetic properties of magneto-optical disks determine the operating principles of writing and reading.
- 2. The information stored on an optical disk can be both read and rewritten.
- 3. The storage capacity of optical disks isn't large enough to store multimedia data.
- 4. Adding data to a magnetic-optical disk doesn't mean the erasure of the previous information.
- 5. A photocell is used to convert digitally coded data into electric signals.
- 6. Digital data is stored on a CD by heat of a low-power laser beam.
- 7. In magneto-optical disks every spot is magnetized in two directions, storing 0 and 1 simultaneously.

### IX. Locating information

Find the passages in the text where the following ideas are expressed. Give the line reference.

- ..... 1. CD-ROMs are employed for storing unchangeable information.
- ..... 2. Coded data are read by means of a special scanner and a photocell.
- ..... 3. A strong laser beam uses the magnetic phenomena for writing information on a magneto-optical disk.
- ..... 4. Stamping machine is one of the variants of storing data on compact disks.
- ..... 5. Magnetic field polarizes spots in magneto-optical disks storing information in the form of binary digits.

### X. Contextual reference

Look back at the text and find out what the words in bold typeface refer to.

- 1. ... that converts **them** into... (l. 7) .....
- 2. ... because **they** are not rewritable... (l. 8) .....
- 3. ... **their** large capacity makes **them** ideal... (l. 10) .....
- 4. ... a variation of CD-ROM **that** allows... (l. 12) .....
- 5. ... of spots on **its** surface... (l. 16) .....



## XI. Understanding words

Refer back to the text and find synonyms for the following words.

- |                    |         |       |
|--------------------|---------|-------|
| 1. very small      | (l. 2)  | ..... |
| 2. to transform    | (l. 7)  | ..... |
| 3. for instance    | (l. 9)  | ..... |
| 4. to permit       | (l. 12) | ..... |
| 5. characteristics | (l. 16) | ..... |

Now refer back to the text and find antonyms for the following words.

- |              |         |       |
|--------------|---------|-------|
| 6. low-power | (l. 3)  | ..... |
| 7. dynamic   | (l. 9)  | ..... |
| 8. previous  | (l. 13) | ..... |
| 9. following | (l. 19) | ..... |
| 10. to heat  | (l. 20) | ..... |

## XII. Word forms

Choose the appropriate word to complete the sentences. Make sure to use the correct form.

- coordination, coordinate, coordinated, coordinating, coordinator
  - The control unit of a processor ... the flow of information between the arithmetic unit and the memory.
  - ... the many activities in a computer department is the job of the department head.
  - The ... of a language institute has assistants to help him and may have access to a computer to help him with the ... of many programs, timetables, space and students results.
- interchange, interchangeable, interchangeably, interchanged
  - The words 'arithmetic-logic' and 'arithmetic-logical' can be used ....
  - There is often an ... of ideas among computer scientists.
  - There is a big difference between an input and an output. These cannot be ... .
- sequence, sequential, sequentially
  - The control unit of the CPU directs the ... operations of the system.
  - Data must be presented ... to the processor unless the computer is programmed otherwise.
  - A program must be a detailed account of the ... the processor must follow to solve the problem.
- execution, execute, executed, executor, executing
  - A load module which is the result of system routines linked with an object module is directly ... by the computer.
  - The time necessary for ... a program, is usually indicated on the computer printout.

- c. An ... program consists of complex routines which are stored in the memory in order to supervise and control certain functions of the computer.

### XIII. Content review

Match the following words in column A with the statements in column B.

- | A  | B  |
|--|--|
| <input type="checkbox"/> 1. pattern      | a. drawing or images to represent objects                |
| <input type="checkbox"/> 2. beam         | b. a thing that is an example to copy                    |
| <input type="checkbox"/> 3. laser        | c. the thing that something owns                         |
| <input type="checkbox"/> 4. graphics     | d. a line of light, energy that you can't see            |
| <input type="checkbox"/> 5. pit          | e. a small mark in the surface of something              |
| <input type="checkbox"/> 6. encyclopedia | f. equipment that produces a powerful beam of light      |
| <input type="checkbox"/> 7. property     | g. a book containing facts about many different subjects |

b. Complete the following statements with appropriate words from the box. (Some can be used more than once.) Make sure you use the correct form, i.e. singular or plural.

electric signal	laser beam	storage	storage medium
digital data	CD-ROM	pit	
surface	compact disk	laser scanner	

Optical ... is an electronic ... that uses low-power ... to record and rewrite ... . In optical storage technology a ... encodes ... onto an optical, or laser, disk in the form of tiny ... arranged in concentric tracks on the disk's ... . A low-power ... is used to 'read' these ..., with variations in the intensity of reflected light from the pits of being converted into ... . This technology is used in the ... which records sound; in the ... which can store text and images as well as sound; in WORM and in newer disks that are totally rewritable.

XIV. Using a dictionary translate paragraph 2 into Russian.

## Unit 8

### The Internet. E-mail

#### Section A. Presentations (continued)

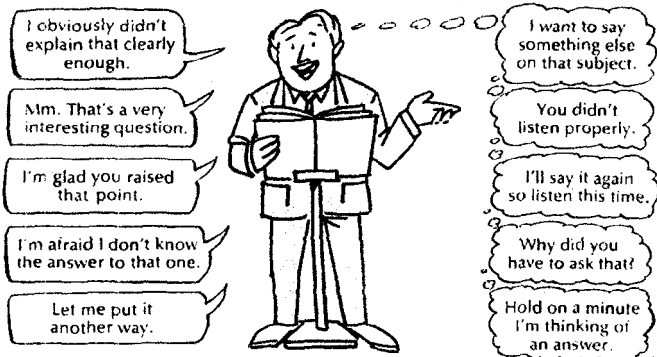
D. Go back over your presentation and think of the questions members of the audience could ask. Ask the questions, and then answer them.

##### *Pinpointing the reference*

- You mentioned ...
- Could I go back to the point you made about ...?
- I was interested in your comments on ...
- You said that ...

##### *Asking for clarification*

- Could you say a little more about that?
- Could you expand on that?
- Could you clarify what you said about ...?
- I'm still a bit confused about ...



#### E. A visitor to your company

Someone is coming to see you at your place of work. You are responsible for his / her visit. Decide who the visitor is (*e.g. client, supplier*).

##### *Before they come:*

1. Work out which system, processes, products, etc the visitor will be most interested in. Decide who they should meet and what parts of the building / factory / site they should see. (Also what they can't see!)
2. Work out an \*itinerary for the visit. You might like to draw a plan or map showing where you are going to go.

\*An *itinerary* is a plan for a visit with times, places and people to see.

***When they come:***

3. Meet the visitor, greet them and explain their itinerary to them.
4. Show them round. When appropriate give short presentations on the company history, the company structure, the factory and offices, machinery and equipment, processes, etc. introduce the visitors to other personnel.
5. Answer any questions that arise.
6. Say goodbye to your visitor.

**Section B      Language Focus. Sentence Structure.  
Compound and Complex Sentences**

- I. **Analyze the following simple sentences. Explain how to find the predicate:**
  1. The term "fourth-generation" (fourth-generation language) places the language in the context of the history of programming.
  2. A computer can solve a series of problems and make hundreds, even thousands, of logical decisions without becoming tired or bored.
  3. The information necessary for solving problems is found in the memory of the computer.
  4. The new microcomputer does not have a Fortran compiler.
  5. The term "computer" usually refers to those parts of the hardware ...
  6. In 1971, Intel corp. delivered the first microprocessor.
  7. They usually fill a whole room and are sometimes referred to as mainframes or computer installations.
- II. **Distinguish between compound and complex sentences. Comment on the way they are joined:**
  1. Another important advancement in computers came in 1947, when John von Neuman developed the idea of keeping instructions for the computer inside the computer's memory.
  2. In 1960, the second generation of computers was developed and these could perform work ten times faster than their predecessors.
  3. Fourth-generation computers have now arrived, and the integrated circuits have been greatly reduced in size.
  4. More powerful microcomputers are gradually being produced; therefore they are becoming the most commonly used type of computers.
  5. A computer can do very little until it is given some information.

6. After the processor has operated on the information, the output devices display the results of the computations on a printer or a terminal.
7. Computers vary greatly in their internal organization, but every digital computer has a processor, memory, an input device to receive information, and output device to transmit information.
8. As the demand grew the number of factories able to produce computers also grew.

**III. Read the sentences. Define the kind of subordinate clauses. Translate the sentences into Russian:**

1. Since people prefer to use words, a new type of the language based on the machine code was developed.
2. A computer is a general purpose machine which represents and processes information.
3. Each problem must be clearly defined before the programming function can be performed.
4. If the program has no errors the central unit begins to execute instructions.
5. We have discussed how the computer can produce letters and drawings as its output.
6. What is interesting to know is that artificial intelligence is machine intelligence.
7. That the first digital computer appeared in 1944 is well-known to everybody.
8. One advantage of this procedure is that the programmer is immediately informed of any syntax error.
9. Scientists study all these problems to find a way out because computer technology has a great potential for more progressive transformation of our society.
10. It is known that the constituent parts of a computer are called hardware.

**IV. Insert and, but, as, since, because, that, which:**

1. Internal memory is a term for primary memory ... its location is within the computer.
2. Secondary memory is called external memory ... it usually consists of recording devices ... are outside the computer.
3. In 1960 the second generation of computers was developed ... these could perform work ten times faster than their predecessors.
4. The digital computer gets its name ... the data ... are presented to it are made up of a code consisting of digits.
5. ROM stands for "Read Only Memory", ... implies ... the processor can read and use the information stored in the ROM chip ... it cannot put information into it.

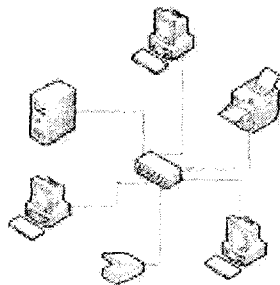
## Section C Reading

- I. What are the main purposes you use the Internet for? Look through paragraph 2 and name the general purposes of the Internet.
- II. Skim paragraph 4 and name what possibilities e-mail offers to its users.
- III. Do you have your own e-mail address? Give it to your groupmates keeping in mind that '@' is pronounced as 'at' and '.' as 'dot'. For example, joe.smith@bbc.co.uk would be read as "joe 'dot' smith 'at' bbc 'dot' co 'dot' uk".
- IV. Study the following words and word combinations and make sure you know their translations. Use a specialized dictionary in case of any difficulties.

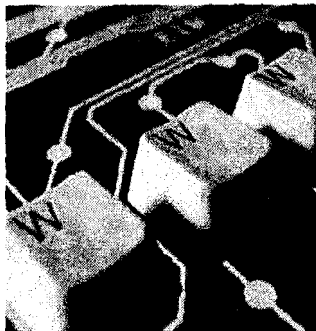
system architecture  
network  
wireless access  
constituent network  
newsgroup  
to transmit a message  
recipient  
to forward

- V. State the type of word-building of the following words and translate them into Russian.  
revolutionized, interconnection, visible, capability, accessible, collaboratively, communication, employee
- VI. Read the text attentively and tell what prospects the Internet and e-mail have.

*The Internet* is a system architecture that has revolutionized communications and methods of commerce by allowing various computer networks around the world to interconnect. Sometimes referred to as a "network of networks," the Internet emerged in the United States in the 1970s but did not become visible to the general public until the early 1990s. By the beginning of the 21st century approximately 360 million people, or roughly 6 percent of the world's population, were estimated to have access to the Internet. It is widely assumed that at least half of the world's population will have some form of Internet access by 2010 and that wireless access will play a growing role.



15 The Internet provides a capability so powerful and general that it can be used for almost any purpose that depends on information, and it is accessible by every individual who connects to one of its constituent networks. It supports human communication via electronic mail (e-mail), "chat rooms," newsgroups, and audio and video transmission and allows people to work collaboratively at many different locations. It supports access to digital information by many applications, including the World Wide Web.



*E-mail* is in full electronic mail messages transmitted and received by digital computers through a network. An e-mail system allows computer users on a network to send text, graphics, and sometimes sounds and animated images to other users.

On most networks, data can be simultaneously sent to a universe of users or to a select group or individual. Network users typically have an electronic mailbox that receives, stores, and manages their correspondence. Recipients can elect to view, print, save, edit, answer, forward, or otherwise react to communications. Many e-mail systems have advanced features that alert users to incoming messages or permit them to employ special privacy features. Large corporations and institutions use e-mail systems as an important communication link between employees and other people allowed on their networks.

## VII. Main idea

Which statement or statements best express the main idea of the text?  
Why did you eliminate the other choices?

- 1. The Internet can be considered as a new medium for personal communication.
- 2. The Internet is suitable practically for any information purpose.
- 3. E-mail has practically replaced the traditional letter writing.

## VIII. Understanding the passage

Decide whether the following statements are true or false (T/F) by referring to the information in the text. Then make the necessary changes so that the false statements become true.

- | T                        | F                        |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. An electronic mailbox can get, save and manage the incoming messages.     |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. An e-mail gives only a possibility to send text documents to other users. |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. The Internet appeared in the United States in the early 1990s and         |

became at once popular.

- 4. The Internet connects personal computers within a very limited area.
- 5. The Internet is a powerful means of information interchange.
- 6. Data can only be sent to one individual user at one time.
- 7. The Internet doesn't require any special means for information access.

### IX. Locating information

Find the passages in the text where the following ideas are expressed. Give the line reference.

- ..... 1. Computer users can send various forms of information by e-mail.
- ..... 2. The Internet has become very popular since its appearance.
- ..... 3. The Internet provides means for human communication via a number of applications.
- ..... 4. Quite a number of operations can be done to transmitted and received electronic messages.
- ..... 5. The Internet is a world-wide network of computers.
- ..... 6. Anyone can join the Internet.

### X. Contextual reference

Look back at the text and find out what the words in bold typeface refer to.

- 1. ... **it** can be used... (l. 16) .....
- 2. ... of **its** constituent networks... (l. 19) .....
- 3. ... **it** supports access to... (l. 25) .....
- 4. ... and manages **their** correspondence... (l. 34) .....
- 5. ... permit **them** to employ... (l. 38) .....
- 6. ... allowed on **their** networks... (l. 40) .....

### XI. Understanding words

Refer back to the text and find synonyms for the following words.

- 1. different (l. 3) .....
- 2. approximately (l. 11) .....
- 3. at one time (l. 32) .....
- 4. to choose (l. 35) .....
- 5. messages (l. 36) .....

Now refer back to the text and find antonyms for the following words.

- 6. to disappear (l. 6) .....
- 7. excluding (l. 27) .....
- 8. in abbreviated form (l. 28) .....
- 9. analog (l. 29) .....
- 10. to transmit (l. 36) .....



## XII. Word forms

Choose the appropriate word to complete the sentences. Make sure to use the correct form.

1. acceptance, accept, accepted, acceptable, acceptably
  - a. A computer is a device which ... processes and gives out information.
  - b. The students are still waiting for their ... into the Computer Science program.
  - c. It is ... to know without a template if the flowcharts are not kept on file.
2. communication, communicate, communicable, communicative
  - a. A computer must be able to ... to user.
  - b. Fiber optics is a widely used development in the field of ... .
  - c. Some people working in computer installations aren't very ... because they are shy.
3. imagination, imagine, imaginable, imaginative, imaginary
  - a. A computer is limited in its ability by the ... of man.
  - b. Some people are good at inventing ... stories.
  - c. It is practically impossible to ... the speed at which a computer calculates numbers.
4. permission, permit, permissible, permitted
  - a. It is usually not ... to smoke in a computer installation.
  - b. Computers ... people to use their time more effectively.
  - c. Building ... is usually required before starting any renovations to a building for a computer department.

## XIII. Content review

Complete the following statements with appropriate words from the box. (Some can be used more than once.) Make sure you use the correct form, i.e. singular or plural.

message	e-mail	access	network	WWW
discussion	newsgroup	service	discussion group	
via	the Internet	information	telephone line	

1. ... is a worldwide ... of computers all linked together ... telephone lines. ... is about people talking and sharing ... . You can do any number of things when you have ... to ..., such as send and receive ..., join ... and look at pages on something called the ... .
2. ... is ... version of the postal ... . Instead of putting a letter into a postbox you send a ... from your computer down a ... . You can send ... to other people who also have ... to ... .
3. ... include the chat forums where you can log in and leave remarks, ask questions and have 'live' ... . There are groups that cover every interest under the sun.

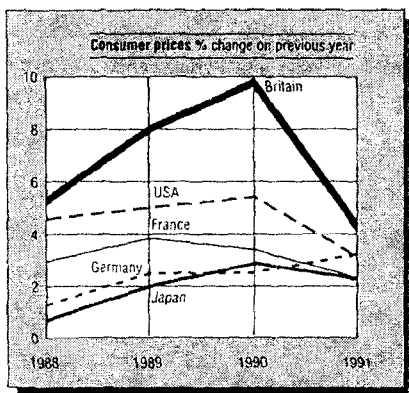
## XIV. Using your dictionary translate paragraphs 2 and 4 into Russian.

## Unit 9

### World Wide Web

#### Section A Presenting information: use of signals

- A. The graph below shows the changes in consumer prices in five major countries between 1988 and 1991. Read the text of a presentation about this graph and notice the use of signals.



Good morning, ladies and gentlemen. Today, I'm going to talk about changes in consumer prices. In Britain, the United States, France, Germany and Japan during the period 1988 to 1991.

First of all, let's look at a country whose price inflation was higher than anyone else's during this period.

As you can see from the graph, price inflation in Britain stood at around 5% in 1988, rising to almost 10% in 1990, before falling back to 4% in 1991.

Now, if we turn to another large trading country, Japan, we can see that the situation is different. Price inflation in Japan was as low as 1% in 1988, and even though it subsequently rose, it was always well below 4%.

#### Notes

Introduces presentation.

Refers to Britain.

Refers to visual.

Changes topic to Japan.

*Finally, let's look at Germany, the only country experiencing a rise in inflation in 1991. This rise from around 2% in 1990 to over 3% in 1991 was largely due to the extra costs of re-unifying East and West Germany.*

Changes topic to Germany.

*In conclusion, we can observe that Britain had the highest rate of inflation of the five countries examined throughout this period, although the gap narrowed substantially in 1991.*

Finishes.

**B. You have just looked at some signals commonly heard in presentations. Look at the following signals and write them under the correct headings in the table below.**

- |                                      |   |                                  |
|--------------------------------------|---|----------------------------------|
| a. Finally ...                       | f. So, to conclude ...                    | k. In conclusion, we can say ... |
| b. After that ...                    | g. I'm going to talk about ...            | l. The next ...                  |
| c. As you can see from the graph ... | h. First ...                              | m. The graph shows               |
| d. Now turning to ...                | i. The aim of this presentation is to ... |                                  |
| e. Now, let's look at ...            | j. What I'd like to talk about is ...     |                                  |

<i>Introducing a subject</i>	<i>Sequencing</i>	<i>Referring to text / visuals</i>	<i>Changing a topic</i>	<i>Concluding</i>

**C. Use the graph above to give a short presentation on European consumer price changes in the five major countries between 1988 and 1991.**

- Give a short introduction.
- Ask people to look at the figures for the United States.
- Change the topic to France.

## Section B Language Focus. One(s). It. That (those)

- I. Translate the sentences into Russian. Mind the emphatic construction with "it":
1. It is a calculating machine that speeds up financial calculations.
  2. It is the Central Processing Unit that executes programs and coordinates the activities of all the other units.
  3. It was in 1820 that the first real calculating machine appeared.
  4. It was Charles Babbage who in 1830 designed a machine that was called "The Analytic Engine".
  5. It was not until 1930 that the first analog computer was built.
  6. It was not until the 19<sup>th</sup> century that a calculating machine was invented which tried to reduce manpower.
- II. Translate the sentences. Mind the meaning of "it":
1. It is important to know what a computer can and cannot do.
  2. It should be recognized that computers are capable of doing repetitive operations.
  3. A computer can only proceed as it has been programmed to.
  4. The most influential component is the Central Processing Unit. It is the "brain" of the computer.
  5. When the computer fails, it is due to human error and is not the fault of the computer at all.
  6. A computer can do very little until it is given some information.
- III. Read and translate the sentences. Mind the meaning of "that (those), one (ones)":
1. A computer can be made more powerful by connecting a second processor to work in parallel with the first one.
  2. It has been forecasted, by the end of this decade, exceptionally faster and smaller computers will replace those in use today.
  3. These calculations were done using devices that are still used today...
  4. Multiprogramming is when more than one program can be present at different storage locations of the memory at the same time.
  5. The first generation computers used vacuum tubes in the processor, the second generation ones applied transistors.
  6. The capabilities of a digital computer are greater than those of an analog computer.
  7. Peripherals include input and output devices, input ones accept information from outside.
  8. This diagram is like that shown in Figure 10.
  9. The term "computer" usually refers to those parts of the hardware in which calculations and other data manipulations are performed.
  10. I don't like this program of yours. Give me the one you compiled last week.

## Section C Reading

- I. What program do you use working with the Internet? Look through paragraph 2 and name the most popular one.
- II. Skim paragraph 1 and name the operating format of the Web.
- III. Study the following words and word combinations and make sure you know their translations. Use a specialized dictionary in case of any difficulties.

to retrieve information

hypertext

client-server format

Hypertext markup Language (HTML)

Uniform Resource Locator (URL)

protocol

to browse

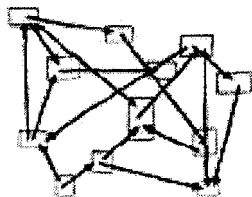
- IV. State the function of the suffix 'er' in the following words and translate them into Russian.

user, lower, stronger, computer, scanner, greater, server, faster, browser

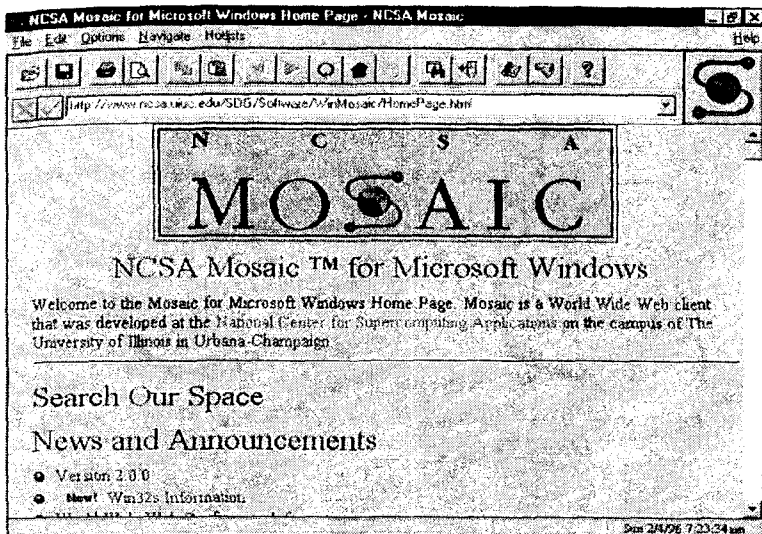
- V. Read the text attentively and name the main operating principle of the Web and the main steps in its development.

The *Web* is the leading information retrieval service of the Internet. The Web gives users access to a vast array of documents that are connected to each other by means of hypertext or hypermedia links—i.e., hyperlinks, electronic connections that link related pieces of information in order to allow a user easy access to them. Hypertext allows the user to select a word from text and thereby access other documents that contain additional information pertaining to that word; hypermedia documents feature links to images, sounds, animations, and movies. The Web operates within the Internet's basic client-server format; servers are computer programs that store and transmit documents to other computers on the network when asked to, while clients are programs that request documents from a server as the user asks for them.

### "ORDINARY" HYPERTEXT



A hypertext document with its corresponding text and hyperlinks is written in Hypertext Markup Language (HTML) and is assigned an online address called a Uniform Resource Locator (URL).



20 The development of the World Wide Web was begun in 1989 by  
 Tim Berners-Lee and his colleagues at CERN, an international scientific  
 organization based in Geneva, Switz. They created a protocol, Hypertext  
 Transfer Protocol (HTTP), which standardized communication between  
 servers and clients. Their text-based Web browser was made available for  
 25 general release in January 1992. The World Wide Web gained rapid  
 acceptance with the creation of a Web browser called Mosaic, which was  
 developed in the United States in September 1993. Mosaic allowed  
 people using the Web to use the same sort of “point-and-click” graphical  
 manipulations that had been available in personal computers for some  
 30 years. Netscape Navigator became the dominant Web browser soon after  
 its release in December 1994. By the mid-1990s the World Wide Web  
 had millions of active users.

## VI. Main idea

Which statement or statements best express the main idea of the text?  
 Why did you eliminate the other choices?

1. The Internet and the Web are two different words for one and the same thing.
2. The creation of HTTP made the Web so popular among users.
3. The Web makes looking around the Internet easy thanks to point-and-click technology.

## VII. Understanding the passage

Decide whether the following statements are true or false (T/F) by referring to the information in the text. Then make the necessary changes so that the false statements become true.

T F

- 1. Servers transmit documents to the computers on the network when asked to.
- 2. The Web simplifies the working with the Internet.
- 3. The documents are connected to each other by means of hypermedia links.
- 4. CERN's image-based Web browser appeared in 1989.
- 5. Both personal computers and the Web use the same kind of 'point-and-click' graphical manipulations.
- 6. A hypertext document is written in one of the computer programming languages.
- 7. Mosaic is still the most popular Web browser among the Internet users.

## VIII. Locating information

Find the passages in the text where the following ideas are expressed. Give the line reference.

- ..... 1. The creation of the Web is connected with the international organization.
- ..... 2. Hypertext and hypermedia links make the access to the Internet documents faster and easier.
- ..... 3. Both the Web and the Internet use the same operating format.
- ..... 4. The first Web browser was developed in America in the early 90s.
- ..... 5. Hypertext links words while hypermedia links multimedia sources.

## IX. Contextual reference

Look back at the text and find out what the words in bold typeface refer to.

- 1. ... easy access to **them**... (l. 8) .....
- 2. ... computer programs **that** store... (l. 13) .....
- 3. ... **they** created a protocol... (l. 21) .....
- 4. ... **their** text-based Web browser... (l. 23) .....
- 5. ... after **its** release... (l. 30) .....

## X. Understanding words

Refer back to the text and find synonyms for the following words.

- 1. to link (l. 4) .....
- 2. to permit (l. 8) .....
- 3. to choose (l. 9) .....
- 4. accessible (l. 23) .....
- 5. kind (l. 27) .....

Now refer back to the text and find antonyms for the following words.

- |              |               |
|--------------|---------------|
| 6. this      | (l. 10) ..... |
| 7. offline   | (l. 18) ..... |
| 8. specific  | (l. 24) ..... |
| 9. different | (l. 27) ..... |
| 10. passive  | (l. 31) ..... |

#### XI. Word forms

Choose the appropriate word to complete the sentences. Make sure you use the correct form.

- location, locate, located
  - The memory of a computer has numerous storage ... called addresses.
  - Have you been able to ... your error?
- performance, perform, performed, performing, performer
  - ... is a verb used quite often in COBOL programming.
  - Data processing refers to the operations which are ... on the data either to derive information from them or to order them in files.
  - The ... of the computer salesman was measured by the number of units he sold.
- relationship, relate, related
  - The first two steps in your program are not ... . They are basically different.
  - In a flowchart the ... between events is shown by means of connecting arrows.
- development, develop, developed, developing, developer
  - In 1960 the second generation of computers was ... .
  - The future will bring great ... in the mechanical devices associated with computer systems.
  - ... the chip made it possible for minicomputers and microcomputers to be invented.
- appearance, appear, appearing
  - The first real calculating machine ... in 1820 as the result of several people's experiments.
  - The ... of new microcomputer systems on the market has increased the competition forcing the prices down.



### XIII. Content review

a. Match the following words in column A with the statements in column B.

- | A                                    | B   |
|--------------------------------------|---|
| <input type="checkbox"/> 1. access   | a. someone who utilizes a product, service          |
| <input type="checkbox"/> 2. user     | b. a computer that gets information from the server |
| <input type="checkbox"/> 3. format   | c. a method of connecting computers                 |
| <input type="checkbox"/> 4. protocol | d. to have a computer that you can use              |
| <input type="checkbox"/> 5. server   | e. pressure of a button on a computer mouse         |
| <input type="checkbox"/> 6. client   | f. the way in which something is organized          |
| <input type="checkbox"/> 7. browser  | g. the main computer                                |
| <input type="checkbox"/> 8. click    | h. a program used to search computer materials      |

b. Complete the following statements with appropriate words from the box. (Some can be used more than once.) Make sure you use the correct form, i.e. singular or plural.

click	site	computer screen	computer language
hotlink	browser	instruction	
access	Internet	point	
graphics	HTML	colour	

1. The World Wide Web makes looking around the ... easy. This is because you can ... and ... on words and ... to move around.
2. The computerized ... which sit behind everything you see on the Web are constructed in an international ... called ... .
3. The web works on the principle of clickable bridges or ... , which take you to another part of a Web ... or to a completely new ... . The links are often blue and underlined. Once the ... has been clicked it will change to another ... .
4. ... is a software program that enables you to ... the Web. It displays Web pages on your ... and allows you to follow ... , download information, etc.

XIV. Translate paragraph 1 into Russian after checking the unknown words in the dictionary.

# Supplementary Texts for Reading

## Text 1 Computer System

Read the text and give the main idea of it.

Computers are electronic machines, which accept data in a certain form, process the data and give the results of the processing in a specified format as information.

Computers can be divided into three main types, depending on their size and power.

**Mainframe** computers are the largest and most powerful. They can handle large amounts of information very quickly and can be used by many people at the same time. They usually fill a whole room and are sometimes referred to as mainframes or computer installations. They are found in large institutions and government departments.

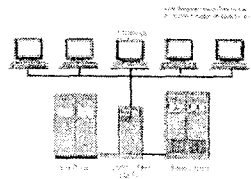
**Minicomputers**, commonly known as minis, are smaller and less powerful than mainframes. They are about the size of an office desk or smaller and are usually found in banks and offices. They are becoming less popular as microcomputers improve.

**Microcomputers**, commonly called as micros, are the smallest and least powerful. They can handle smaller amounts of information at a time and are ideal for use as home computers, but are also used in education and business. More powerful micros are gradually being produced; therefore they are becoming the most commonly used types of computers.

A computer can do very little until it is given some information. This is known as the input and usually consists of a program and some data.

A **program** is a set of instructions, written in a special computer language, telling the computer what operations and processes have to be carried out and in what order they should be done. **Data**, however, is the particular information that has to be processed by the computer, e.g. numbers, names, measurement.

Information in the form of data and programs is known as **software**, and mechanical parts that make a computer system are called **hardware**. A standard computer system consists of three main sections: the Central Processing Unit (CPU), the main memory and the peripherals.



(to be continued)

## Text 2 Computer System (continued)

Read the text and give the summary of it.

Perhaps the most influential component is the **Central Processing Unit**. Its function is to execute programming and coordinate the activities of all the other units. It is the 'brain' of the computer. The unit consists of three main parts:

a) the **Control Unit**, which examines the instructions in the user's program, interprets each instruction and causes the circuits and the rest of the components – disk drives, monitors, etc. -- to be activated to execute the functions specified;

b) The **Arithmetic Logic Unit (ALU)**, which performs mathematical calculations (+, -, etc.);

c) The **registers**, which are high-speed units of memory used to store and control information. One of these registers is the program Counter (PC) which keeps track of the next instruction to be performed in the main memory. Another is the Instruction Register (IR) which holds the instruction that is currently being executed.

The **main memory** holds the instructions and data which are currently being processed by the CPU. It has two types: RAM and ROM, both contained in electronic chips connected to the main board of the computer. **RAM** stands for 'Random-Access Memory' and is the working area of the computer, that is, the basic location where the microprocessor stores the required information. All the information stored in the RAM is temporary. **ROM** is the acronym for 'Read-Only Memory', which implies that the processor can read and use the information stored in the ROM chip, but cannot put information into it. ROM chips have 'constant' information, including instructions and routines for the basic operations of the CPU.

The **peripherals** are the physical units attached to the computer. They include storage devices and input/output devices.

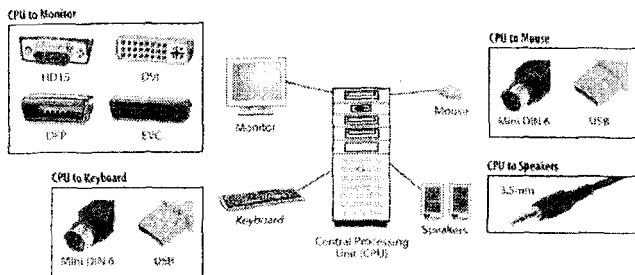
**Storage devices** (floppy or hard disks) provide a permanent storage of both data and programs. **Disk drives** are used to handle one or more floppy disks. **Input devices** enable data to go into the computer's memory. The most common input devices are the **mouse** and the **keyboard**. **Output devices** enable us to extract the finished product from the system. For example, the computer shows the output on the **monitor** or prints the results onto paper by means of a **printer**.



## Text 3 Central Processing Unit

Read the text and retell it.

At the centre of the computer system is the CPU, which can be considered to be the “brain” of the computer. Its main components are the central processor and the main memory. The speed and capacity of these components have been greatly improved with each new generation of computers. In the first generation, the central processor was built from electronic valves, which were rather unreliable. The second generation used transistors. The third generation used integrated circuits. The fourth generation of computers uses microprocessors. These are contained on electronic chips, which are slices of silicon with thousands of electronic components and circuits engraved on them.



Early computers used magnetic cores in their main memory but fourth generation computers use much smaller and more powerful electronic memory chips.

The two parts of the central processor are the Control Unit (CU) and the arithmetic and Logic Unit (ALU).

The **control unit** controls all other units in the computer system. It decodes the program instructions and makes sure they are carried out in the correct sequence. The **arithmetic and logic unit**, on the other hand, performs the calculations and data manipulation e.g. comparing, sorting and combining data.

These units have small, short-term storage areas called registers, which are used for special tasks. For example, the register in the CU known as the program counter is used to hold the address of the next instruction to be carried out. The register in the ALU known as the accumulator is used to temporarily hold the data item currently being processed.

Each unit of the CPU is connected by a group of wires called a bus. There are data buses for carrying data from one unit to another, control buses for sending control signals to each unit and address buses for accessing each part of the main memory.

The power of CPU is partly determined by its speed. This is controlled by a clock in the processor, which sends out regular pulses to each unit to keep them in step. The clock pulse rate is measured in megahertz (MHz).

## Text 4 Basic Software

### Read the text and give the main idea of it.

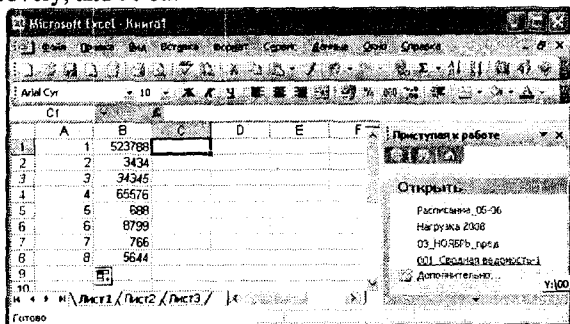
Information provided by programs and data is known as software. Programs are sets of instructions that make the computer execute operations and tasks. There are two types of software:

-- The system software refers to all the programs which control the basic functions of a computer. They include operating systems, system utilities (e.g. an anti-virus program, a back-up utility) and language translators (e.g. a compiler – the software that translates instructions into machine code).

-- The applications software refers to all those applications – such as word processors and spreadsheets – which are used for specific purposes. Applications are usually stored on disks and loaded into the RAM memory when activated by the user.

The operating system is the most important type of system software. It is usually supplied by the manufacturers and comprises a set of programs and files that control the hardware and software resources of a computer system. It controls all the elements that the user sees, and it communicates directly with the computer. In most configurations, the OS is automatically loaded into the RAM section when the computer is started up.

**System utilities** are small programs which improve a system's performance and help users take advantage of the computer's capabilities. They are often desk accessories that can be called up while you're working in another application. They can also be INITs – i.e. system extensions which are activated when you turn on the computer; control devices which you adjust in the control panel, or even stand-alone programs that run when you need them. Utilities are available for back-up, file search, virus protection, disaster recovery, and so on.



**Spreadsheets\*** are application programs for financial planning which allow the user to analyse information presented in tabular form, by manipulating rows and columns.

\* spreadsheet – электронная таблица

## Text 5 Computer Languages.

Read the text and give the summary of it.

Unfortunately, computers cannot understand ordinary spoken English or any other natural language. The only language they can understand directly is called **machine code**: central processors operate on codes which consist of a series of binary digits (1s and 0s). In this form, the instructions are said to be in machine codes.

However, machine code as a means of communication is very difficult to write. For this reason, we use symbolic languages that are easier to understand. Then, by using a special program, these languages can be translated into machine codes. For example, the so-called **assembly languages** use abbreviations such as ADD, SUB, MPY to represent instructions. These mnemonic codes are like labels easily associated with the items to which they refer.

Basic languages, where 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 still quite complex and restricted to particular machines.

To make the programs easier to write and to overcome the problem of intercommunication between different types of machines, higher-level languages were designed such as BASIC, COBOL, FORTRAN or PASCAL. These languages are all problem-oriented rather than machine-oriented and can be converted into the machine codes of different types of computers. Programs written in one of these languages (known as **source programs**) are converted into a lower-level language by means of a **compiler** (generating the **object program**). On compilation, each statement in a **high-level language** is generally translated into many machine code instructions.

People communicate instructions to the computer in symbolic languages and the easier this communication can be made the wider the application of computer will be.

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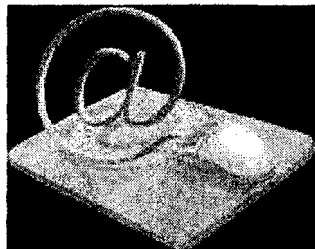
Translation: "No I do not think I've been spending too much time at the computer."

## Text 6 The Language of E-mail.

Read the text and retell it.

E-mail is the simplest and most immediate function of the internet for many people. Run through a list of questions that new e-mail users ask most and some snappy answers to them.

**What is electronic mail?** E-mail, as it's normally shortened to, is just a message that is composed, sent or read electronically (hence the name). With regular mail you write your message (letter, etc) and drop it off at the post office. The postal service then delivers the message and the recipient reads it. E-mail operates basically the same way except that everything happens electronically. You compose your message using e-mail software, send it over the lines that connect the Internet's networks and the recipient uses an e-mail program to read the message.



**How does e-mail know how to get where it's going?** Everybody who's connected to the Internet is assigned a unique e-mail address. In a way, this address is very like the address of your house or apartment because it tells everyone else your exact location on the net. So anyone who wants to send you an e-mail message just tells the e-mail program the appropriate address and runs the Send command. The Internet takes over from there and makes sure the message arrives safely.

**What's a flame?** The vast majority of e-mail correspondence is civil and courteous, but with millions of participants all over the world, it's inevitable that some folks will rub each other the wrong way. When this happens, the combatants may exchange emotionally charge, caustic, often obscene messages called flames. When enough of these messages exchange hands, an out-and-out flame war develops. These usually burn themselves out after a while, and then the participants can get back to more interesting things.

**Is e-mail secure?** In a word no. The Net's open architecture allows programmers to write interesting and useful new Internet services, but it also allows unscrupulous snoops to lurk where they don't belong. In particular, the e-mail has two problems: it's not hard for someone else to read your e-mail, and it's fairly easy to forge an e-mail address. If security is a must for you, then you'll want to create an industrial strength password for your home directory, use encryption for your most sensitive messages, and use an anonymous remailer when you want to send something incognito.

# КРАТКИЙ ГРАММАТИЧЕСКИЙ СПРАВОЧНИК

Таблица 1

Личные местоимения			Притяжательные местоимения		
Именительный падеж	Объектный падеж		Присоединительная форма		Абсолютная форма
<b>I</b> я	<b>me</b> меня, мне...		<b>my</b> мой		<b>mine</b>
<b>He</b> он	<b>him</b> его, ему...		<b>his</b> его		<b>his</b>
<b>She</b> она	<b>her</b> ее, ей...		<b>her</b> ее, ее		<b>hers</b>
<b>It</b> он, она, оно <i>(обозначает неодушевленные предметы)</i>	<b>it</b> его, ему... ее, ей		<b>its</b> его, ее		<b>its</b>
<b>We</b> мы	<b>us</b> нас, нам...		<b>our</b> нам		<b>ours</b>
<b>You</b> ты, вы	<b>you</b> тебя, тебе; вас, вам		<b>your</b> твой, ваш		<b>yours</b>
<b>They</b> они	<b>them</b> их, им...		<b>their</b> их		<b>theirs</b>
<i>всегда подлежащее в предложении</i>	<i>всегда дополнение в предложении, отвечает на вопросы косвенных падежей</i>		<i>предшествует существительному как определение, отвечает на вопрос "чей?"</i>		<i>никогда не сопровождается существительным</i>

Таблица 2

## Местоимения *many, much, few, little*

Исчисляемые существительные (одушевленные и неодушевленные)			Неисчисляемые существительные		
<b>many</b> много			<b>much</b> много		
<b>few</b> мало		<b>engineers</b>	<b>little</b> мало		<b>water, work</b>
<b>a few</b> немного, несколько		<b>plants</b>	<b>a little</b> немного		

Таблица 3

## Неопределенные и отрицательные местоимения

<b>some</b>	<i>некоторый, несколько</i>	<i>какой-нибудь</i>	<b>somebody, someone</b>	<i>кто-то, кто-нибудь</i>
<b>any</b>		<i>какой-нибудь, всякий, любой</i>	<b>something</b>	<i>что-то, что-нибудь</i>
			<b>anybody, anyone</b>	<i>кто-нибудь, всякий</i>
<b>no</b>	<i>никакой</i>		<b>anything</b>	<i>все, что-нибудь</i>
			<b>nobody, no one</b>	<i>никто</i>
			<b>nothing</b>	<i>ничто</i>



## Словообразование

Префиксы	Значение	Примеры	
<i>un- dis- in- im- il- ir- non-</i>	отрицательные	unhappy to dismount inexperienced immovable illogical irresponsible non-ferrous	-несчастный -демонтировать -неопытный -неподвижный -нелогичный -безответственный -цветной
<i>re-</i>	повтор действия	to re-use to remake	-вновь (снова) использовать -переработать
<i>mis-</i>	ошибочно, неверно	to misuse	-неправильно употреблять
<i>over-</i>	сверх, чрезмерно	to overpay	-переплачивать
<i>under-</i>	недостаточно	to underpay	-недоплачивать, оплачивать низко
<i>pre-</i>	перед, ранее; предварительно	prewar to preheat	-предвоенный, довоенный -предварительно нагревать
<i>post-</i>	после	post-war	-послевоенный
<i>anti-</i>	анти-, противо-	antifriction antiphase	-антифрикционный -противофаза
<i>counter-</i>	контр-, противо-	countershaft counter-pressure	-контрпривод -противодавление
<i>inter-</i>	между, взаимно	intergranular intercoagulation	-межзернистый -взаимная коагуляция
<i>sub-</i>	под-	subprogram subscale	-подпрограмма, часть программы -подокалина
<i>super-</i>	сверх-, супер-	superfast superheat superfinish	-сверхскоростной -перегрев -суперфинишировать

## СЛОВООБРАЗОВАНИЕ

Суффиксы				
существительных	прилагательных	глаголов	наречий	
<b>-er (-or)</b> (указывает на действующее лицо или устройство) to supply <b>supplier</b> to heat - <b>heater</b>	<b>-ful</b> (указывает на присутствие качества) <b>care - careful</b> заботливый, осторожный	<b>-ize (-ise)</b> crystal to <b>crystallize</b> кристаллизовать (ся)	<b>-ly</b> easy <b>easily</b> легко week <b>weekly</b> еженедельно first - <b>firstly</b> во-первых	
<b>-ment</b> to agree - <b>agreement</b> соглашение	<b>-less</b> (указывает на отсутствие качества) <b>care - careless</b> беззаботный, неосторожный	<b>-lify</b> pure to <b>purify</b> очищать simple to <b>simplify</b> упрощать		
<b>-ance (-ence)</b> to resist <b>resistance</b> to differ - <b>difference</b> различие	<b>-able (-ible)</b> to attain <b>attainable</b> достижимый to convert - <b>convertible</b> обратимый	<b>-en</b> strength to <b>strengthen</b> усиливать (ся)		
<b>-ness</b> brittle - <b>brittleness</b> хрупкость	<b>-ant (-ant)</b> to resist - <b>resistant</b> сопротивляющийся to differ - <b>different</b> различный			
<b>-ion (-ation, -tion, -sion)</b> to connect - <b>connection</b> соединение to transmit - <b>transmission</b> передача	<b>-ous</b> <b>danger - dangerous</b> опасный			
<b>-ship</b> leader - <b>leadership</b> руководство	<b>-ive</b> to act - <b>active</b> деятельный			
<b>-ity</b> productive - <b>productivity</b> производительность	<b>-ic</b> <b>base - basic</b> основной			
<b>-ability (-ibility)</b> machinable - <b>machinability</b> обрабатываемость	<b>-al</b> <b>centre - central</b> центральный			
<b>-ure (-ure, -sure, -ssure)</b> to press - <b>pressure</b> давление				

Для того чтобы суметь без помощи словаря понять многие интернациональные слова, встречающиеся в текстах, необходимо знать основные буквенные соответствия в английском и русском языках, а именно:

В английском языке	В русском языке	Примеры
с	к ц	<i>conductor, dielectric process</i>
g	г ж	<i>gas, organ, magneto engineer</i>
у	и ия (в конце слов)	<i>system, crystal theory, geometry</i>
ch	х	<i>mechanism, technology</i>
х	кс	<i>complex, experiment</i>
au	ав ау	<i>automobile, automatic pause, auditorium</i>
qu	кв	<i>quartz, equivalent</i>
th	т	<i>theory, theorem</i>
(at)ion, tion	ция	<i>tradition, ionization</i>
ssion	ссия	<i>discussion, transmission</i>
ture	тура	<i>structure, temperature</i>
ti	ц	<i>potential, differential</i>

Следует помнить, что произношение интернациональных слов в английском языке, за исключением незначительного количества слов, отличается от их произношения в русском. Поэтому для их понимания нужно взять в качестве исходного момента не звучание английских слов, а их написание латинскими буквами, например:

*pilot, period, meter, structure* и т.д.

Таблица 6

#### Основные формы глагола

V <sub>1</sub> инфинитив	V <sub>2</sub> Past Simple	V <sub>3</sub> Past Participle	V <sub>4</sub> Participle I	
to use	<u>used</u>	<u>used</u>	using	правильный глагол
to get	got	got	getting	неправильный глагол
to know	knew	known	knowing	

## Личные и неличные формы глагола

формы глагола делятся на:

1. **Личные**, которые выражают лицо, число, время, залог и наклонение. Они служат в предложении сказуемым и при них всегда имеется подлежащее.
2. **Неличные**, которые выражают действие без указания лица, числа и наклонения; они могут быть только частью сказуемого или выполнять функции других членов предложения. К ним относятся инфинитив, причастие и герундий.

### Структура простого повествовательного распространенного предложения.



1. Присутствие подлежащего и сказуемого в предложении обязательно.
2. Определение входит в состав той группы, слово которой оно определяет. Оно может быть левым (л.о.) или правым (п.о.) по отношению к определяемому существительному.

л.о.



Mechanics deals with the laws of mechanical motion.



п.о.

3. Чтобы определить синтаксическую функцию слова, необходимо делать анализ предложения, который следует начинать с нахождения сказуемого. Его легко распознать по:

а) вспомогательным глаголам (в личной форме):

**to be** – am, is, are; was, were

**to have** – have, has; had

**to do** – do, does; did

**shall, will**

a. Mechanical energy furnished by a water wheel or an engine

II

| is converted | by a generator into electrical energy.

b. Because of its numerous advantages the electric motor

II

| has largely replaced | other motive power.

II

c. This inert core | does not contribute | directly to the properties  
of the element, both electrical and chemical.

d. When the temperature of the vessel decreases, some of the steam

II

II

| will be condensed | and | will give up | the latent heat.

б) модальным глаголам:

can (could); may (might); must (to be (to)); to have (to); should, ought

II

a. Chemical energy | can be converted | into electrical energy  
directly without going through heat.

II

b. To do so we | must make | use of an electric cell.

в) наречиям неопределенного времени, которые сопутствуют сказуемому:

always, already, often, seldom, sometimes, usually, generally,  
commonly, never, ever...

II

Thus, the current in a conductor | always produces |  
magnetic field surrounding or linking with the conductor.

г) подлежащему, выраженному личным местоимением в именительном падеже:

I, he, she, it, we, you, they

II

Now we | place | this coil within, say, 30 cm or so of the primary.

д) беспредложному дополнению, выраженному существительным в общем падеже или личным местоимением в объектном падеже (me, him, her, it, us, you, them):

II

a. Changes of current in one circuit | induce | a current in another circuit.

II

b. This | causes | it to act likewise, and so on.

е) второй форме неправильных глаголов:

II

W. Gilbert, the English physician and physicist, | wrote | about attraction as well as repulsion in connection with his experiments on magnetism.

ж) грамматическому окончанию "-s (-es)", "-ed":

II

a. This | causes | the next neighbouring valence electron to act likewise...

II

b. The invention of the electric cell | opened | the way for the use of a continuously flowing current.

Примечание:

1) окончание -s (-es) может быть формальным признаком существительного во множественном числе.

I

II

IV

Their studies begin in September.

2) окончание -ed может быть формальным признаком третьей формы (V<sub>3</sub>) правильного глагола:

I

V<sub>3,онп</sub>

II

Any gas contained in a vessel | exerts | pressure.

4. Каждый член предложения может быть выражен одним словом или группой слов. Группа слов, состоящая из нескольких существительных (или существительных и прилагательных), не разделенных ни предлогом, ни артиклем, ни знаком препинания, называется ИМЕННОЙ ГРУППОЙ. На начало именной группы часто указывает предлог, артикль или заменяющие артикль другие определители, например, притяжательные, указательные, неопределенные или отрицательные местоимения, числительные и др. Перевод именной группы следует начинать с последнего существительного, а предшествующие существительные – определения можно переводить:

а) прилагательным;

*tube steel* – трубная сталь

*steel tube* – стальная труба

б) существительным в родительном падеже;

*cylinder head* – головка цилиндра

в) существительным с предлогом;

*gear steel* – сталь для зубчатых колес

*compression strength* – прочность на сжатие

г) одним термином;

*track ditch* – кювет

### Анализ сложного предложения

1. Сложносочиненное предложение состоит из двух или более простых предложений, которые соединяются между собой либо с помощью сочинительных союзов *and*, *but*, *or* и др., либо без них. Сложносочиненное предложение анализируется так же, как и простое предложение.

I	II		I	II
Dynamics	deals	with objects in movement and	statics	studies
bodies in a state of rest, that is, a state of equilibrium.				

Динамика рассматривает предметы в движении, а статика изучает тела в состоянии покоя, т.е. в состоянии равновесия.

I	II	I	II
The laboratory	is well equipped	, it	has
all the necessary equipment.			

Лаборатория хорошо оборудована, в ней есть все необходимое оборудование.

2. Сложноподчиненное предложение состоит из главного и одного или нескольких придаточных предложений. Придаточное предложение присоединяется к главному при помощи:

а) подчинительных союзов:

*because, as, if, whether, since, after, before* и др.

Any moving object performs work *because* it is moving.

Любой движущийся предмет выполняет работу, потому что движется.

б) союзных слов:

*who(m), what, which, that (который), where* и др.

Mechanics is the science *which* studies motion and forces.

Механика – это наука, которая изучает движение и силы.

в) бессоюзной связи (придаточные определительные и дополнительные). Признаком бессоюзной связи придаточного определительного предложения является стык двух существительных или существительного и личного местоимения в именительном падеже.

The properties of carbon steels depend on the quantity of carbon they contain.

Свойства углеродных сталей зависят от количества углерода, которое они содержат.

Примечания:

1) Союзные слова отличаются от союзов тем, что не только связывают придаточное предложение с главным, но и входят в состав придаточного предложения в качестве одного из его членов.

2) Предлог в конце придаточного определительного предложения относится к союзному слову, которое подразумевается.

The instrument | we are talking about | is very accurate.

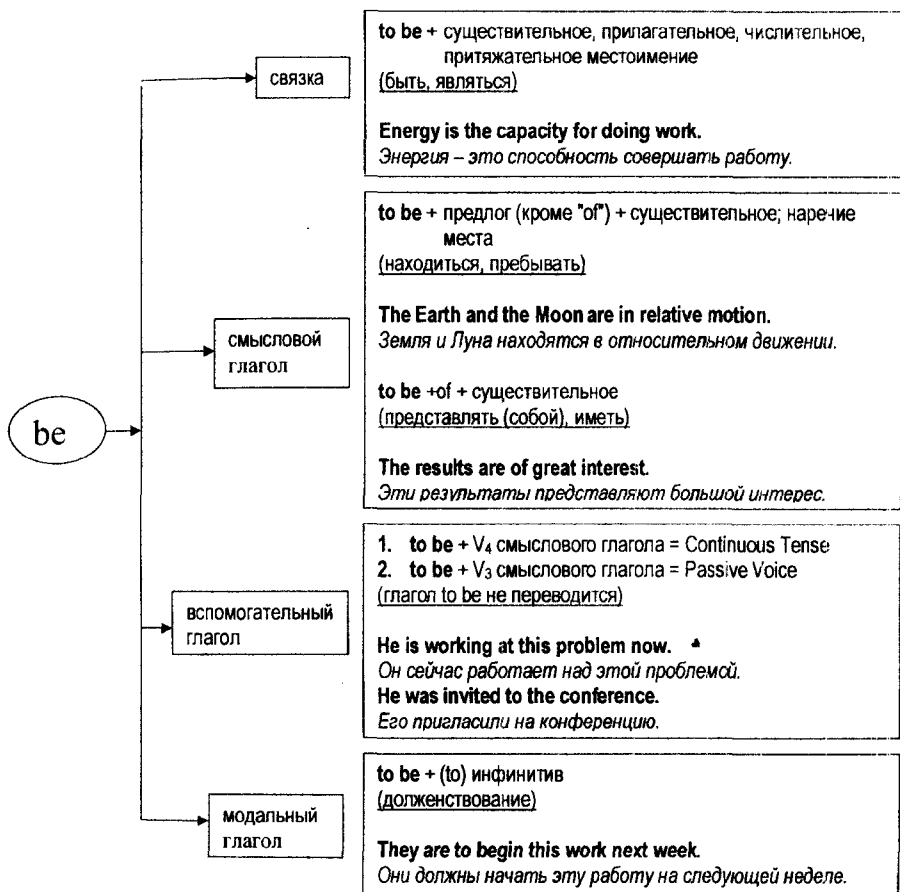
Прибор, о котором мы сейчас говорим, очень точный.

3) Каждое придаточное предложение занимает в главном предложении место определенного члена предложения и поэтому может быть:





## Функции глагола to be



## Оборот *There is / are*

(**быть, находиться, существовать**)

Данная конструкция указывает на наличие (или отсутствие) в определенном месте какого-либо еще неизвестного (не называвшего ранее) предмета или лица. Конструкция *There is / are* стоит, как правило, в начале предложения, а за ней следует подлежащее, выраженное существительным, т.е. имеет место обратный порядок слов.

Если в предложении с оборотом *There is / are* имеется обстоятельство, то перевод следует начинать с этого обстоятельства.

There are some magazines on the desk.

На письменном столе несколько журналов.

При отсутствии обстоятельства места перевод предложения следует начинать с самого оборота, т.е. со слов “имеется”, “существует”.

There are different forms of energy.

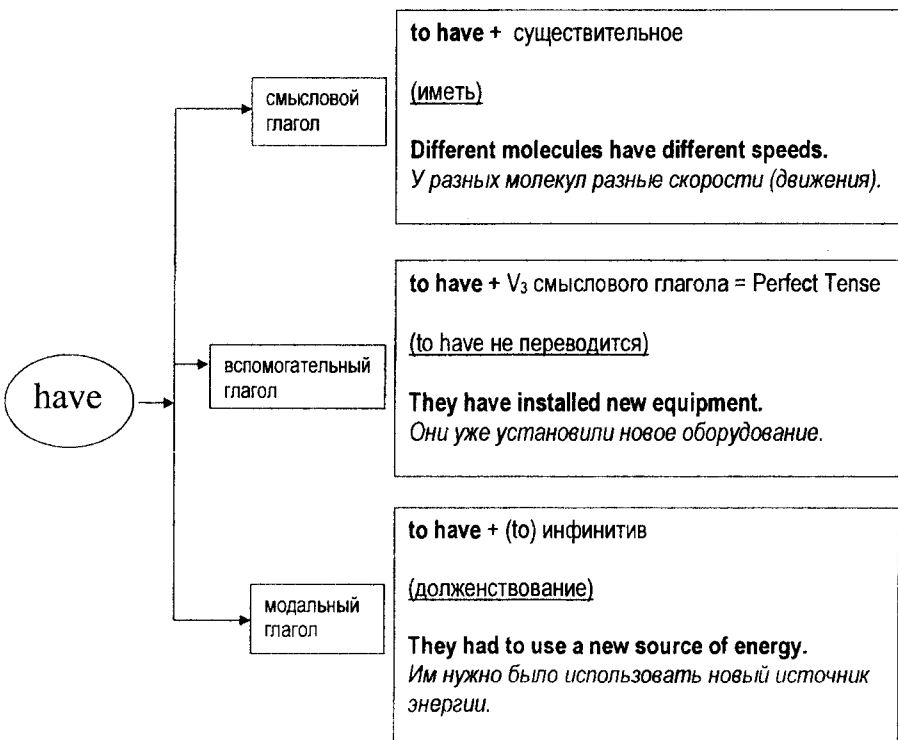
Существуют различные формы энергии.

### Примечание:

“*There*” в конструкции “*there is / are*” теряет свое лексическое значение и отдельно не переводится.

Таблица 8

### Функции глагола to have



## **Страдательный залог. Его образование и способы перевода**

**to be + Past Participle** смыслового глагола



показатель времени, лица и числа

Страдательный залог показывает, что подлежащее пассивно, т.е. оно подвергается действию со стороны другого лица или предмета.

Страдательный залог можно переводить на русский язык:

1) возвратным глаголом с окончанием “-ся”

One form of energy is transformed into another.

Одна форма энергии превращается в другую.

2) неопределенно-личным предложением с глаголом в третьем лице множественного числа действительного залога

This system of measurement is called the metric system.

Эту систему измерения называют метрической системой.

3) глаголом “быть” (в прошедшем или будущем времени) и краткой формой причастия страдательного залога

The law of conservation of matter was discovered by Lomonosov.     ♦

Закон сохранения материи был открыт Ломоносовым.

### Примечания:

1. Страдательный залог с подлежащим *it* переводится неопределенно-личным предложением:

it was thought ... - Думали, полагали ...

It is known ... - Известно ...

2. Если за сказуемым в страдательном залоге стоит дополнение с предлогом "by" (обозначает лицо или предмет, воздействующее на подлежащее) или "with" (обозначает инструмент или орудие труда), то это дополнение можно переводить:

а) творительным падежом при сохранении формы страдательного залога сказуемого;

б) именительным падежом, при этом сказуемое английского предложения передается глаголом в действительном залоге.

Three basic laws of motion were discovered by Newton.

Три основных закона движения были открыты Ньютоном.

Ньютон открыл три основных закона движения.

3. Подлежащее английского предложения при сказуемом в страдательном залоге можно переводить существительным или местоимением как в именительном, так и в косвенном падеже (как правило, винительном или дательном).

The scientists were offered new themes for research.

Ученым предложили новые темы для научной работы.

He is asked to show the results of his experiment.

Его просят показать результаты эксперимента.

4. Если за сказуемым в страдательном залоге стоит предлог, не относящийся к последующим словам, то при переводе на русский язык этот предлог ставится перед подлежащим.

II

This law is often referred to in physics.

На этот закон часто ссылаются в физике.

К наиболее часто употребляемым в страдательном залоге глаголам, требующим предложного дополнения, относятся:

to act on (upon) – действовать на

to depend on – зависеть от

to insist on – настаивать на

to refer to – ссылаться на  
 to rely on (upon) – полагаться на  
 to send for – посылать за  
 to speak about - } говорить о  
 to talk about – }  
 to think of – думать о  
 to work at – работать над

5. В английском языке имеется ряд глаголов, которые являются переходными, т.е. требуют прямого дополнения, в то время как соответствующие русские глаголы являются непереходными и требуют предложного дополнения. К таким глаголам относятся:

to affect (somebody, something)	влиять (на кого-нибудь, на что-нибудь)
to answer (something)	отвечать (на что-нибудь)
to approach (something)	подходить к чему-либо, рассматривать что-либо
to follow (somebody, something)	следовать (за кем-нибудь, за чем- нибудь)
to influence (somebody, something)	влиять (на кого-нибудь, на что-нибудь)
to watch (somebody, something)	следить (за кем-нибудь, за чем-нибудь)

The results were affected by the presence of impurities.

На результаты повлияло присутствие примесей.

## Видо-временные формы английского глагола в активном залоге.

	Present	Past	Future
<b>Simple</b>	ask (he, she, it) asks	asked	shall will ask
<b>Continuous</b> to be + V <sub>4</sub> смыслового глагола	am is are asking	was were asking	shall will be asking
<b>Perfect</b> to have + V <sub>3</sub> смыслового глагола	have has asked	had asked	shall will have asked
<b>Perfect Continuous</b> to have been + V <sub>4</sub> смыслового глагола	have has been asking	had been asking	shall will have been asking

Таблица 10

**Видо-временные формы английского глагола в страдательном залоге**

	Present	Past	Future
<b>Simple</b> to be + V <sub>3</sub> смыслового глагола	am is are      asked	was were      asked	shall will      be asked
<b>Continuous</b> to be being + V <sub>3</sub> смыслового глагола	am being is being are being      asked	was being were being      asked	—
<b>Perfect</b> to have been + V <sub>3</sub> смыслового глагола	have been has been      asked	had been asked	shall will      have been asked

**Модальные глаголы**

Модальными называются глаголы, которые выражают не действие, а отношение говорящего к действию, выраженному последующим инфинитивом, т.е. возможность, вероятность или необходимость совершения действия.

Модальные глаголы имеют следующие особенности:

1. Смысловый глагол стоит после них без частицы "to".

New technologies must be used.

2. Вопросительную и отрицательную формы образуют без помощи вспомогательного глагола.

Can you solve the problem?

I cannot solve this problem.

3. Не изменяются по лицам и числам.

He	}	must complete the work on the road in time.
They		



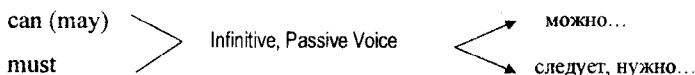
4. Не имеют неличных форм: инфинитива, причастия, герундия.
5. Не имеют формы будущего времени, а глагол "must" не имеет и формы прошедшего времени. Для восполнения недостающих форм модальные глаголы имеют равнозначные словосочетания, которые называются эквивалентами модальных глаголов.

**Таблица модальных глаголов и их эквивалентов**

Модальный глагол	Значение	Present Simple	Past Simple	Эквивалент
can may	возможность, способность совершения действия	can may	could might	to be able (to) to be allowed (to)
must	долженствование, т.е. необходимость совершения действия	must	--	to be (to) to have (to)
ought (to) should	долженствование (для выражения морального долга)	ought (to) should	-- --	-- --

**Сочетание модальных глаголов с инфинитивом в страдательном залоге**

В научно-технической литературе часто встречается сочетание модальных глаголов can, may, must с инфинитивом смыслового глагола в страдательном залоге, которое следует переводить:



can (may) > not + Infinitive, Passive Voice <— нельзя...  
must <— не следует...

Work can be expressed in any units of force and distance.

Работу можно выразить в любых единицах силы и расстояния.

The new equipment must be tested.

Следует проверить новое оборудование.

This device cannot be used, it is out of order.

Этот прибор нельзя использовать, он не исправен.

### **Сочетание модальных глаголов с перфектным инфинитивом**

*must, may, might + Perfect Infinitive* выражает вероятное предположение в совершении действия, относящегося к прошлому, и переводится словами "возможно", "вероятно", "видимо", "должно быть", "следовало бы".

These scientists may have already obtained the necessary data. \*

Эти ученые, возможно, получили необходимые данные.

All the preparations for the experiment must have been completed long ago.

Все приготовления к эксперименту, должно быть, были давно закончены.

*can (could) + Perfect Infinitive* в отрицательной или вопросительной форме выражает удивление, категорическое отрицание, сомнение по поводу того, что действие, выраженное инфинитивом, действительно совершилось. Может переводиться словами "не может быть", "разве".

He cannot have done it.

Не может быть, чтобы он это сделал.

## Многофункциональные слова

Выполняя различные функции в предложении, многофункциональные слова переводятся на русский язык по-разному.

### Т Н А Т

1. Указательное местоимение: that (those) + существительное

At **that** point the line drops down to zero.

В **этой** точке линия падает до нуля.

2. Союз: что, чтобы

It is known **that** copper has a greater conductance than iron.

Известно, **что** медь обладает большей проводимостью, чем железо.

3. Союзное слово: который

This is the material **that** can withstand very high temperature.

Это – материал, **который** может выдерживать очень высокую температуру.

4. Слово-заместитель ранее упомянутого существительного (в этом случае после that (those) стоит предлог или причастие в функции определения)

The direction of a body's motion is the same as **that** of the force acting on it.

Направление движения тела такое же, как и направление силы, действующей на него.

### И Т

1. Личное местоимение 3-го лица, единственного числа (о неодушевленных предметах)

Nothing in the world moves faster than light. It moves at the rate of 300,000 km/s.

Ничто в мире не движется быстрее света. Он движется со скоростью 300000 км/с.

## 2. Указательное местоимение “это”

It was our project.

Это был наш проект.

## 3. Формальное подлежащее в безличных предложениях

It is warm.

Тепло.

It is necessary to do this work.

Необходимо сделать эту работу.

It seemed to us that the device was out of order.

Нам показалось, что прибор не в порядке.

4. Вводное слово в предложениях с эмфатическим (усилительным) оборотом *it is (was) ... who (that, which, whom...)*..., который выделяет любой член предложения, кроме сказуемого. Выделяемый член предложения ставится после *it is (was)*, а оставшаяся часть образует придаточное предложение, вводимое союзом или союзным словом. Такое предложение переводится на русский язык простым предложением с усилительными словами “именно”, “только”, “только лишь”

It was in May when we received the new equipment.

Именно в мае мы получили новое оборудование.

It was not until 1997 that this book was published.

Только в 1997 году эта книга была опубликована.

## ONE(S)

1. Числительное “один”: one + существительное

one + of + существительное

I know only **one** solution of this problem.

Я знаю только одно решение этой задачи.

2. Неопределенно-личное местоимение в функции подлежащего. На русский язык следует переводить неопределенно-личным или безличным предложением.

**One** believes that ...

Полагают, что...

**One** knows that ...

Известно, что...

**One** must expect that ...

Следует ожидать, что...

**One** has to be careful while testing the new machine.

a) Нам нужно быть внимательными при испытании новой машины.  
b) Нужно быть внимательными при испытании новой машины.

3. Слово-заместитель ранее упомянутого существительного (в этом случае **one** имеет такие определители существительного, как артикль, окончание множественного числа, определения, выраженные прилагательным, указательными и неопределенными местоимениями, и т.д.)

Some materials are good conductors of heat and other are poor ones.

Некоторые материалы – хорошие проводники тепла, а другие плохие.

## Многофункциональный глагол “to do”

1. Смысловый глагол “делать”, “совершать”

This machine-tool **does** various operations.

Этот станок выполняет различные функции.

2. Вспомогательный глагол для образования вопросительной и отрицательной форм времен группы Simple:

Do you know this law?

Вы знаете этот закон?

Some substances **do not** conduct heat.

Некоторые вещества не проводят тепло.

3. Для образования отрицательной формы повелительного наклонения.

**Do not** go there

Не ходите туда

4. Для усиления просьбы перед формой повелительного наклонения. **Do** в таких случаях употребляется также перед **have** и **be**.

**Do** come to-night

Приходите (непрерывно) сегодня вечером.

5. Для усиления действия, выраженного глаголом-сказуемым в утвердительных предложениях. При переводе таких предложений на русский язык употребляются усилительные слова “действительно”, “именно”, “все же”

This equipment **does** help them a lot in their work.

Это оборудование действительно очень помогает им в работе.

6. Заместитель предшествующего сказуемого во избежание его повторения. В этом случае глагол to do переводится тем глаголом, который он заменяет, или вообще не переводится.

Metals conduct electricity better than most of the non-metals **do**.

Металлы проводят электричество лучше, чем большинство неметаллов.

## Степени сравнения прилагательных и наречий

Прилагательные		Положительная	Сравнительная	Превосходная
	Односложные	long easy	longer easier	<u>the longest</u> <u>the easiest</u>
	Многосложные	difficult active	<u>more</u> difficult <u>more</u> active	<u>the most</u> difficult <u>the most</u> active
	Исключения	good bad little *far	better worse less farther/ further	the best the worst the least the farthest/ furthest
Наречия		fast hard soon early easily actively	faster harder sooner earlier <u>more</u> easily <u>more</u> actively	fastest hardest soonest earliest <u>most</u> easily <u>most</u> actively
	Исключения	well badly much little far	better worse more less farther/ further	best worst most least farthest/ furthest

Таблица 12

## Сравнительные конструкции.

Предметы или лица имеют одинаковую степень качества.	This box is as heavy as that one. Этот ящик такой же тяжелый, как и тот.
Предметы или лица имеют неодинаковую степень качества.	<b>This box is not so (as) heavy as that one.</b> Этот ящик не такой тяжелый, как тот.
	<b>This box is less heavy than that one.</b> Этот ящик менее тяжелый, чем тот.
	<b>This box is twice as heavy as that one.</b> Этот ящик в два раза тяжелее того.
	<b>This box is half as heavy as that one.</b> Этот ящик в два раза легче того.
	<b>This box is half the weight of that one.</b> Этот ящик в два раза легче того.

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КИПНИС Инна Юрьевна  
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