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**УЧЕБНО – ПРАКТИЧЕСКОЕ ПОСОБИЕ**  
**Computer Engineering BASICS**

по дисциплине \_\_\_\_\_ «Иностранный язык»

для студентов \_\_\_\_\_ 2-4 \_\_\_\_\_ курсов

специальности \_\_\_\_\_ 25.02.06 «Сетевое и системное администрирование»

**РАССМОТРЕНО**

на заседании предметно-цикловой комиссии  
общеобразовательных и естественнонаучных  
дисциплин

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Данное учебное пособие разработано в соответствии с требованиями федерального государственного образовательного стандарта среднего профессионального образования и рабочей программы по английскому языку и предназначено для студентов 2-4 курса специальности 25.02.06 «Сетевое и системное администрирование».

Цель настоящего пособия – обучение иностранному языку в ходе взаимосвязанного развития умений в основных видах речевой деятельности, совершенствование речевых навыков и умений использования лексического материала. Пособие позволит студентам усвоить термины специальных технических текстов, а также ознакомиться с оригинальными текстами, взятыми из английских журналов и газет.

Основная задача данного пособия состоит в том, чтобы помочь студентам овладеть компьютерной терминологией, а также усовершенствовать свои навыки английского языка.

Пособие содержит тексты по основным разделам вычислительной техники, упражнения к текстам, направленные на подготовку студентов к пересказу и самостоятельным высказываниям.

Данное пособие можно использовать как для самостоятельного изучения английского языка, так и в качестве дополнительного учебного пособия во время занятий.

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## UNIT 1 History of Computers

### Vocabulary

to calculate -вычислять ['kælkjuleit]	to figure out ['figə aʊt]- вычислять
an abacus -счеты ['æbəkəs]	attached [ə'tæʃt]- прикрепленный
a bead frame [bi:d freim]- счеты	a generation [dʒenə'reiʃn]- поколение
a devise - устройство	to encapsulate [ɪn'kæpsjuleit]- герметизировать, поместить
calculus ['kælkjʊləs]- вычисление; математический анализ	keeping instruction- инструкция по хранению
a slide rule- логарифмическая линейка	a predecessor ['pri:disesə] - предшественник
reduce [ri'dju:s] уменьшать	dependable [di'pendəbl] - надежный
ten-toothed gear wheels - ступенчатый валик	to count in tens- считать десятками
a chip - чип	multiply of tens- умножать на десятки

to aim guns- наводить орудия на цель	a great deal- много
rectangular [rek'tæŋgjʊlə]- прямоугольный	extra- дополнительный
responsible- ответственный [ris'pɒnsəbl]	altogether [ɔ:ltə'geðə] - полностью
a layer ['leɪə] - слой	a vacuum tube - электронная лампа

## 1. Read and translate the text

Let's take a look at the history of the computers that we know today. The very first calculating device used was the ten fingers of a man's hands. This, in fact, is why today we count in tens and multiply of tens. Then the abacus was invented, a bead frame in which the beads are moved from left to right. People went on using some form of abacus well into the 16th century, it is being used in some parts of the world because it can be understood without knowing how to read.

During the 17th and 18th centuries many people tried to find easy ways of calculating. J. Napier, a Scotsman, devised a mechanical way of multiplying and dividing, which is how the modern slide rule works. Henry Briggs used Napier's ideas to produce logarithm which all mathematicians used today.

Calculus, another branch of mathematics, was independently invented by both Sir Isaac Newton, an Englishman, and Leibnitz, a German mathematician. The first real calculating machine appeared in 1820 as the result of several people's experiments. This type of machine, which saves a great deal of time and reduces the possibility of making mistakes, depends on a ten-toothed gear wheels.

In 1830 Charles Babbage, an Englishman, designed a machine that was called 'The Analytical Engine'. This machine, which Babbage showed at the Paris Exhibition in 1855, was an attempt to cut out the human being altogether, expert for providing the machine with the necessary facts the problem to be solved. He never finished this work, but many of his ideas were the basis for building today's computers.

In 1930, the first analog computer was built by American named Vannevar Bush. The device was used in World War II to help aim guns. Mark I, the name given to the first digital computer, was completed in 1944. The men responsible for this invention were Professor Howard Aiken and some people from IBM. This was the first machine that could figure out long of mathematical problems all at a very fast speed.

In 1946 two engineers at the University of Pennsylvania, J. Eckert and J. Mayshly, built the first digital computer using parts called vacuum tubes. They named their new invention UNIAc. The first generation of computers, which used vacuum tubes, came out in 1950. UNIAc I was an example of these computers which could perform thousands of calculations per second.

In 1960, the second generation of computers was developed and could perform work ten times faster than their predecessors. The reason for this extra speed was the use of transistors instead of vacuum tubes. Second generation computers were smaller, faster and more dependable than first generation computers.

The third-generation computers appeared on the market in 1965. These computers could do a million calculations a second, which is 1000 times faster than the first generation computers. Unlike second-generation computers, these are controlled by tiny integrated circuits and are consequently smaller and more dependable.

Fourth-generation computers have now arrived, and the integrated circuits that are being developed have been greatly reduced in size. This is due to microminiaturization, which means that the circuits are much smaller than before; as many as 1000 tiny circuits now fit onto a single chip. A chip is a square or rectangular piece of silicon, usually from 1/10 to ¼ inch, upon which several layers of an integrated circuit are attached or imprinted, after which the circuit is encapsulated in plastic metal. Fourth generation computers are 50 times faster than third-generation computers and can complete approximately 1.000.000 instructions per second.

## **2. Translate from English into Russian:**

- |                                      |                              |
|--------------------------------------|------------------------------|
| 1. the very first calculating device | 7. first digital computer    |
| 2. to count in tens                  | 8. to figure out             |
| 3. to multiply of tens               | 9. ten times faster          |
| 4. without knowing                   | 10. extra speed              |
| 5. to be independently invented      | 11. tiny integrated circuits |
| 6. to save a great deal of time      | 12. to keep instruction      |

## **3. Translate from Russian into English:**

- |   |                              |
|---|------------------------------|
| 1. знать сегодня                          | 7. аналоговый компьютер      |
| 2. 10 пальцев руки человека               | 8. скорость                  |
| 3. продолжать использовать                | 9. придерживаться инструкции |
| 4. счета                                  | 10. транзистор               |
| 5. настоящая счетно-вычислительная машина | 11. интегрированные схемы    |
| 6. попытка                                | 12. электронные лампы        |

**4. Fill in each blank with a word chosen from the list below to complete the meaning of the sentence:**

*chip, speed, figure out, calculating, reduces, microminiaturization, analog, logarithm, abacus, machine, vacuum tubes, tiny, dependable, devised*

1. The very first ..... device used was 10 fingers of a man's hand.
2. Then, the ..... was invented.
3. J. Napier ..... a mechanical way of multiplying and dividing.
4. Henry Briggs used J. Napier's ideas to produce .....
5. The first real calculating ..... appeared in 1820.
6. This type of machine ..... the possibility of making mistakes.
7. In 1930 the first ..... computer was built.
8. This was the first machine that could ..... mathematical problems at a very fast speed.
9. In 1946 was built the first digital computer using parts called ....
10. The reason for this extra ..... was the use of transistors instead of vacuum tubes.
11. The second generation computers were smaller, faster and more ..... than first-generation computers.
12. The third-generation computers are controlled by ..... integrated circuits.
13. This is due to ....., which means that the circuits are much smaller than before.
14. A ..... is a square or rectangular piece of silicon, usually from 1/10 to 1/4 inch.

**5. Fill in the preposition:**

1. Let us take a look ..... the history of computers.
2. That is why we count ..... tens and multiply ..... tens.
3. The beads are moved ..... left ..... right.
4. Abacus is still being used ..... some parts ..... the world.
5. Calculus was independently invented ..... both Sir Isaac Newton and Leibnitz.
6. This type of machine depends ..... a ten-toothed gear wheels.
7. «The Analytical Engine» was shown ..... the Paris Exhibition ..... 1855.
8. The men responsible ..... this invention were Professor Howard Aiken and some people ..... IBM.
9. The first generation of computers came ..... in 1950.
10. Due to microminiaturization 1000 tiny circuits fit ..... a single chip.

**6. Finish the following sentences:**

1. The first generation of computers came out in .....
2. The second generation of computers could perform work ten times faster than their .....
3. The third-generation computers appeared on the market in .....
4. The fourth-generation computers have been greatly .....
5. The fourth-generation computers are 50 times faster and can .....

**7. Find the synonyms to the following words in the text:**

*simple, to carry out, up to date, quick, to try, small*

**8. Find the antonyms to the following words in the text:**

*like, short, to increase, sole, dependently*

**9. Arrange the items of the plan in a logical order according to the text:**

1. J. Napier devised a mechanical way of multiplying and dividing.
2. The very first calculating device was the ten fingers of a man's hands.
3. Babbage showed his analytical engine at Paris Exhibition.
4. The first real calculating machine appeared in 1820.
5. The first analog computer was used in World War II.

**10. Answer the questions on the text:**

1. What was the very first calculating device?
2. What is abacus? When did people begin to use them?
3. When did a lot of people try to find easy ways of calculating?
4. Who used Napier's ideas to produce logarithm?
5. What was invented by Sir Isaac Newton and Leibnitz?
6. What did Charles Babbage design?
7. When was the first analog computer built? How did people use it?
8. Who built the first digital computer?
9. How did the first generation of computers work?
10. What are the differences between the first and the second computer generations?
11. When did the third-generation computers appear?

**11. Match the parts**

1	abacus	a	produced logarithm
	J. Napier	b	was independently invented by Isaac Newton Leibnitz
2	1820	c	built the first analog computer
3	Charles Babbage	d	Mark I, the first digital computer
4	Vannevar Bush	e	built the first digital computer using vacuum tubes
5	Henry Briggs	f	the use of transistors instead of vacuum tubes
6	Calculus	g	designed 'The Analytical Engine'
7	Howard Aiken	h	the first real calculating machine appeared
8	J. Eckert and J. Mayshly	i	was used into the 16th century
9	the second generation of	k	devised a mechanical way of multiplying

computers	and dividing
-----------	--------------

## 12. Arrange the words with a similar meaning in pairs:

1. to calculate	a. additional
2. an abacus	b. machine
3. extra	c. decrease
4. devise	d. to figure out
5. reduce	e. a bead frame

## UNIT 2 What is a Computer?

### Vocabulary

intricate - сложный

tiny -

крошечный

a core - сердечник

to manipulate -

управлять

to magnetize -

намагничивать

to perform - выполнять

to supply- снабжать,

поставлять

capability -

возможность

addition -

сложение

subtraction-

вычитание

division -

деление

multiplication -

умножение

exponentiation- возведение в степень

to feed- вводить,

подавать

a microcomputer -

микрокомпьютер

a circuit – цепь, схема

unfortunately – к

сожалению

dull [dʌl]- скучный,

неинтересный

a routine [ru:'ti:n]- программа

a judgement ['dʒʌdʒmənt]-

решение

instantaneously - мгновенно

[ɪnstən'teɪniəsli]

remarkable powers- удивительные

свойства

make decisions- принимать

решения

arrange- расположить

### 1. Read and translate the text.

A computer is a machine with an intricate network of electronic circuits that operate switches or magnetize tiny metal cores. The switches, like the cores, are capable of being in one of two possible states, that is, on or off; magnetized.

The machine is capable of storing and manipulating numbers, letters and characters.

The basic idea of a computer is that we can make the machine do what we want by inputting signals that turn certain switches on and turn others off, or that magnetize or do not magnetize the cores.

The basic job of computers is the processing of information. For this reason, computers can be defined as devices which accept information in the form of instructions called a program and characters called data performing mathematical and logical operations on the information, and then supply results of these operations.

The program or a part of it, which tells the computers what to do and the data, which provide the information needed to solve the problem, are kept inside the computer in a place called memory.

Computers are thought to have many remarkable powers. Most computers, whether large or small have three basic capabilities.

First, computers have circuits for performing arithmetical operations, such as: addition, subtraction, division, multiplication and exponentiation. Second, computers have means of communicating with the user. If we couldn't feed information in and get results back these machine wouldn't be of much use.

However, certain computers (commonly minicomputers and microcomputers) are used to control directly things such as robots, aircraft navigation systems, medical instruments, etc. Some of the most common methods of inputting information are to use terminals, diskettes, disks and magnetic tapes.

The computer's input device reads the information into the computer. For outputting information, two common devices are used a printer which prints the new information on paper, or a cathode-ray tube (CRT) display screen which shows the results on a TV-like a screen. Third, computers have circuits which can make decisions. The kinds of decisions which computer circuits can make are not of the type: 'Who would win a war between two countries?' or 'Who is the richest person in the world?' Unfortunately, the computer can only decide three things, namely: 'Is one number use more often than another?' 'Are two numbers equal?' and, 'Is one number greater than another?'

A computer can solve a series of problems and make hundreds even thousands of logical operations without becoming tired or bored. A computer can replace people in dull routine, but it works according to the instructions given to it and cannot exercise value judgements.

A computer cannot do anything unless a person tells it what to do and gives the appropriate information, but because of electric pulses can move at the speed of light, a computer can carry out vast numbers of arithmetical-logical operations almost instantaneously.

## 2. Translate into Russian

- |                                  |                                |
|----------------------------------|--------------------------------|
| 1. an intricate network          | 9. an input device             |
| 2. tiny metal cores              | 10. for outputting information |
| 3. by inputting signals          | 11. a decision                 |
| 4. the processing of information | 12. to replace                 |
| 5. to define                     | 13. appropriate                |
| 6. to provide                    | 14. to carry out               |
| 7. to solve                      | 15. vast                       |
| 8. memory                        |                                |

## 3. Translate into English

- |  |                              |
|--|------------------------------|
| 1. переключатель, подобный металлическому сердечнику | 9. непосредственно управлять |
| 2. буквы и знаки (символы)                           | 10. схема                    |
| 3. намагничивать металлический сердечник             | 11. механический мозг        |
| 4. обработка информации                              | 12. ограниченный             |
| 5. выполнять механические и логические операции      | 13. до тех пор пока          |
| 6. данные  | 14. подходящий               |
| 7. замечательный                                     | 15. скорость света           |
| 8. средства связи с пользователем                    | 9. непосредственно управлять |

## 4. Fill in the necessary words

1. A computer is a ..... with an intricate network of electronic circuits.
2. The machine is ..... of storing and manipulating numbers, letters and characters.
3. The basic job of a computer is the ..... of information.
4. Most computers have three basic ..... .
5. Computers have ..... for performing arithmetical operations.

6. Certain computers are used ..... directly things such as robots, medical instruments, etc.

7. For outputting information two common ..... are used.

8. A computer can ..... people in dull routine.

**5. Fill in the gaps the prepositions:**

1. A computer is a device ..... an intricate network.

2. The switches are capable of being ..... one or two states.

3. We can make the machine do what we want ..... inputting signals.

4. Computers accept information ..... the form of instructions called a program.

5. Computers have circuits ..... performing operations.

6. Computers have means of communicating ..... the user.

7. Input device may be a disk drive depending ..... the medium used ..... inputting information.

8. Computers can solve a series of problems ..... becoming tired or bored.

**6. Give the appropriate definitions of the following terms**

*computer, data, memory, input, device, output*

**7. Find the synonyms to the following words in the text**

*work, difficult, to fulfill, fundamental, to end, equipment, complex, way, uninterested, an accomplishment*

**8. Find the antonyms to the following words in the text**

*output, smaller, interesting, poor, dark, alive, large, receiving, reject, unusual*

**9. Arrange the items of the plan in a logical order according to the text:**

1. A computer can solve a series of problems and make hundreds even thousands of logical operations.

2. The basic job of computers is the processing of information.

3. A computer is a machine with an intricate network of electronic circuits.
4. Computers have circuits for performing arithmetic operations.
5. The machine is capable of storing and manipulating numbers, letters and characters.
6. Some of the most common methods of inputting information are to use terminals.
7. For outputting information only two common devices are used.

### 10. Answer the following questions

1. What is a computer?
2. What is it capable to do?
3. What is the basic job of a computer?
4. How do we call a program, which tells the computer what to do?
5. Do computers have many remarkable powers?
6. What can computer solve?
7. Can computers do anything without a person?

## UNIT 3 Computer Applications

### Vocabulary

to adjust [ə'dʒʌst]- регулировать, настраивать	an image ['ɪmɪdʒ]- изображение
advanced [əd'vɑ:nst]- самый современный, передовой	huge [hju:dʒ] - огромный
to amend [ə'mend]- исправлять	to resemble [rɪ'zembəl]- походить, напоминать
to assist [ə'sɪst]- помогать	launching ['lɔ:nʃɪŋ]- запуск
to conjure ['kɒndʒə]- вызывать	a marvel ['mɑ:vəl]- чудо
to contribute [kən'trɪbjʊ:t]- способствовать	random ['rændəm]- случайный; произвольный
conversing [kən'vɜ:sɪŋ]- общение	to rely on- полагаться на
to check in [tʃek ɪn]- проверять, регистрировать	a relative ease ['relətɪv i:z]- относительная легкость, простота
to maintain [meɪn'teɪn]- поддерживать	a terminal ['tɜ:mɪnəl]- терминал

to enable [ɪ'neɪbl]- позволять	tremendous [trɪ'mendəs]- огромный
to execute ['eksɪkjʊ:t]- выполнять, исполнять	apart from [ə'pɑ:t frɒm]- помимо, кроме
to guide [gaɪd]- направлять	diminishing [dɪ'mɪnɪʃɪŋ]- уменьшающийся

## 1. Read and translate the text:

Many people have or will have had some experience of «conversing» with computers. They may have their own micro-computer, they may use a terminal from the main company at work or they may have a television set with a view data facility. Those who do not have this experience may observe the staff at, for example, an airline check-in or a local bank branch office sitting at their desks, pressing keys on a typewriter like a keyboard and reading information presented on a television type screen. In such a situation the check-in clerk or the branch cashier is using the computer to obtain information (e.g. to find out if a seat is booked) or to amend information (e.g. to change a customer's name and address).

The word computer conjures up different images and thoughts in people's mind depending upon their experiences. Some view computers as powerful, intelligent machines that can maintain a 'big brother' watch over everyone. Others are staggered and fascinated by the marvels achieved by the space programs of the superpowers, where computers play an important part.

Numerous factories use computers to control machines that make products. A computer turns the machines on and off and adjusts their operations when necessary. Without computers, it would be impossible for engineers to perform the enormous number of calculations needed to solve many advanced technological problems. Computers help in the building of spacecraft, and they assist flight engineers in launching, controlling and tracking the vehicles. Computers also are used to develop equipment for exploring the moon and planets. They enable architectural and civil engineers to design complicated bridges and other structures with relative ease.

Computers have been of tremendous help to researchers in the biological, physical and social sciences. Chemists and physicists rely on computers to control and check sensitive laboratory instruments and to analyze experimental data. Astronomers use computers to guide telescopes and to process photographic images of planets and other objects in space.

Computers can be used to compose music, write poems and produce drawings and paintings. A work generated by a computer may resemble that a certain artist in birth style and form, or it may appear abstract or random. Computers are also used

in the study of the fine arts, particularly, literature. They have also been programmed to help scholars identify paintings and sculptures from ancient civilizations.

But computers do not have intelligence in the way humans do. They cannot think for themselves. What they are good at is carrying out arithmetical operations and making logical decisions at phenomenally fast speed. But they only do what humans program gives them to do.

Apart from the speed at which computers execute instruction, two developments in particular have contributed to the growth in the use of computers – efficient storage of large amounts of data and diminishing cost. Today, computers can store huge amount of information on magnetic media and any item of this information can be obtained in a few milliseconds and displayed or printed for the user.

## **2. Translate into Russian:**

- |                                    |                                   |
|------------------------------------|-----------------------------------|
| 1. some experience of conversing   | 8. advanced technological problem |
| 2. view data facility              | 9. to guide telescopes            |
| 3. to obtain information           | 10. ancient civilization          |
| 4. powerful, intelligent machine   | 11. arithmetical operations       |
| 5. to be straggled and fascinated  | 12. logical decisions             |
| 6. to adjust operations            | 13. to execute instructions       |
| 7. enormous number of calculations | 14. efficient storage             |

## **3. Translate these into English:**

- |   |   |
|---|---|
| 1. использовать терминал главной компании                         | 7. чувствительное оборудование                  |
| 2. нажимать кнопки на клавиатуре                                  | 8. анализировать экспериментальные данные       |
| 3. получить информацию  | 9. могут быть использованы для сочинения музыки |
| 4. различные образы   | 10. работа, управляемая компьютером             |
| 5. компьютер включает и выключает машины                          | 11. помочь ученым определить                    |
| 6. разработать оборудование для исследования Луны и других планет | 12. не могут думать сами                        |

## **4. Match words on the left with their equivalents on the right**

1. to amend	a. huge
2. to assist	b. besides
3. enormous	c. evoke
4. apart from	d. to contribute
5. to guide	e. to help
6. to conjure	f. to reduce
7. a marvel	g. to remind
8. to resemble	h. to direct
9. to diminish	i. a wonder
10. to promote	j. to correct

### 5. Fill in the gaps necessary prepositions

1. People may use a terminal ..... the main company ..... work.
2. A clerk can press keys ..... a typewriter.
3. The word computer conjures ..... a different images.
4. A computer turns the machine ..... and ..... .
5. Computers help ..... building of spacecraft.
6. They are used to develop equipment ..... exploring the moon and planets.
7. Chemists and physicists rely ..... computers to control sensitive instruments.
8. Computers don't have intelligence ..... the way humans do.
9. Computers are good ..... arithmetical operations.
10. Computers can store huge amounts of information ..... magnetic media.

### 6. Ask general questions

1. People may use a terminal from the main company at work.
2. The check-in clerk is using the computer to obtain information.
3. The word computer conjures up different images and thoughts in people's mind.
4. Numerous factories use computers to control machines that make products.
5. A computer turns the machine on and off and adjusts their operations.
6. Computers help in the building of spacecraft and assist flight engineers in launching.
7. Chemist and physicists rely on computers.
8. A work generated by a computer may resemble that a certain artist in a birth style and form.
9. Computers do only what humans program them to do.
10. Computers obtain huge amounts of information in a few milliseconds.

### 7. Are these statements false or true?

1. Only a few people have or will have had some experience of «conversing» with computers.
2. The word computer conjures up the same images and thoughts in computer's brain depending upon the structure of the computer.
3. Without computers it would be impossible for engineers to perform the enormous number of calculations.
4. Architects and civil engineers can't design complicated bridges and other structures with the help of computers.
5. Computers haven't been of tremendous help to researchers in the biological, physical and social sciences.
6. Poets and physicists rely on computers to control and check sensitive laboratory equipments.
7. Computers can be used to compose music, write poems and produce drawings and paintings.
8. Computers have intelligence in the way humans do.
9. Today, computers are very big, slow and can store little information on magnetic media.

**8. Write the plan of the text to retell it in English.**

**9. Points for discussion: advantages and disadvantages of computers.**

## **UNIT 4 Information, machine words, instructions, address and reasonable operations**

### **Vocabulary**

sign	знак, обозначение; символ;	matching	согласование
character	знак; символ; цифра, буква, признак	variable	переменная (величина)
typewriter	пишущая машинка	include	включать
react	реагировать	zero	нуль; нулевая точка
unit	единица; блок; устройство, элемент	separate	отдельный
rotation	вращение; чередование	consist (of)	состоять (из)
voltage	напряжение; разность потенциалов	some	некоторый
handle	управлять; оперировать	surface	поверхность; плоскость
the same	тот же самый	address	адрес; v адресовать
arrangement	расположение, размещение	square	квадрат; площадь
state	устанавливать, указывать	determine	v определять

contain	содержать	power	<i>n</i> мощность; сила; энергия; степень, способность
call	называть	sorting	сортировка
polarize	['pəʊləraɪzɪd] поляризовать	represent	представлять
mark	знак		

## 1. Read and translate the text:

*Information* is a set of marks or signs that have meaning. These consist of letters or numbers, digits or characters, typewriter signs, other kinds of signs, and so on. A computer reacts differently to different digits or characters, and reacts to them as units that have meaning. For example, information for an analog computer has to be in the form of distances, or rotations, or voltages, or other physical variables. And for a digital computer information has to be in the form of digits or numbers.

Any information may be represented by the binary system including two digits: one (1) and zero (0). Each 1 and 0 is a separate binary digit called a bit. A *bit* is the smallest part of information, Bits are typically grouped in units that are called bytes. A byte is the basic unit of information used in modern computers and consists of eight bits.

*The bytes* are handled usually in standard groups called machine words or just words. There are two basic types of information or words that can be put into a memory cell or location: words that are numerical quantities\* and words that are computer instructions. Regularly, an instruction to the machine is expressed as a word; and so the same set of characters may have meaning sometimes as a number, sometimes as an instruction. A speed of 96,000 characters per second is the same as a speed of 8,000 words per second. Most human beings could not take even 12-digit number per second.\*

Physically the set of bits is a set of arrangements of some physical equipment. One of the ways of storing information in a computer is storing by using a set of small magnetically polarized spots (пятна) on a magnetic surface.

The computer is told what operations to perform by means of instructions. An *instruction* is a command to the computer. It consist of a verb (an operational code) and a noun (an operand). For example, if the computer is instructed. “Add 365 the number of times (раз) stated in the register R”, and if the register R stores the code for number 3, then the computer will perform that operation three times. An instruction word looks like a number, and there is no way to tell from the word itself whether it is a quantity or an instruction. The computer must be told exactly (точно) which address contains an instruction and which contains a quantity.

An *address* is the name of particular memory location or cell. Each memory location (word or byte) has its own unique address or number just like a post office box\*. For example, if the computer contains 100 memory cells, their respective address might be the numbers\* from 1 to 100 (or 0 through 99). And instead of saying "A word is in a memory cell", the computer personnel say, "The contents (содержимое) of an address is a word."

Reasonable operations are mathematical and logical. Mathematical operations include arithmetic and algebraic operations. Arithmetic operations are addition, subtraction, multiplication, division, taking a square root, etc.; and algebraic operations are called raising to a power as well as differentiating and integrating.

Logical operations include comparing, selecting, sorting, matching, etc. These are operations which may be performed either on numbers, or on expressions consisted of letters such as ordinary words. A very important logical operation performed by a computer is determining, i.e., which of two operations is to be performed next.

### Notes

1. numerical quantities - численные значения (величины)
2. Most human beings could not take even 12-digit number per second -  
Большинство людей не смогли бы воспринять даже 12-значное число в секунду
3. just like a post office box - точно так же как почтовый ящик
4. their respective addresses might be the numbers - их соответственные адреса могли бы быть числами

### 2. Find the equivalents:

1. numerical measurements	a. физическое оборудование
2. by using physical analogs	b. скорость в секунду
3. the binary system	c. численные величины
4. any information	d. численные измерения
5. other physical variables	e. двоичная система
6. numerical quantities	f. любая информация
7. a speed per second	g. один из способов
8. one of the ways	h. особая ячейка памяти
9. a particular memory cell	i. используя физические аналоги
10. physical equipment	j. другие физические переменные

### 3. Arrange (a) synonyms and (b) antonyms in pairs and translate them:

a) to perform; to compute; to take in; a figure; to arrange; to show; to carry out; a digit; to calculate; little; to display; small; to receive; to position; instruction; data; location; command; information; cell

b) inside; to the right; addition; multiplication: simple; to the left; division; outside; small; complex; big; subtraction; differentiating; at the right; integrating; at the left; the right-hand column; the left-hand column

#### **4. Form nouns from the verbs by adding suffixes:**

##### **-ment**

*Model: to equip - equipment*

to arrange, to require, to measure, to state, to develop

##### **-sion**

*Model: to divide - division*

to decide, to include, to conclude, to exclude

##### **-ion**

*Model: to direct - direction*

to subtract, to select, to react, to construct, to act

##### **-ation**

*Model: to compute - computation*

to inform, to combine, to determine, to represent, to polarize

#### **5. Complete the following sentences:**

1. Information is a set of marks or signs that ... . 2. Reasonable operations are ... . 3. Logical operations include ... . 4. A very important logical operation is ... . 5. Physically the set of bits is a set of arrangements of some ... . 6. Determining means which of two operations is to be performed ... . 7. The computer must be told exactly which address contains ... and which contains ... . 8. The computer is told what operations to perform by means of ... . 9. Any information may be represented by the binary systems including two digits: ... and ... . 10. A bit is the smallest part of ... .

#### **6. Memorize (Выучить наизусть) the following definitions:**

1. Information is a set of marks or signs that have meaning. 2. Reasonable operations are mathematical and logical operations. 3. Mathematical operations include arithmetic and algebraic operations. 4. The smallest unit of information for a computer is called a byte. A byte consists of eight bits. 5. The word "bit" is formed from the letter "b" in the word "binary" and two letters "it" in the word "digit".

#### **7. Answer the following questions:**

1. What is information? 2. What does a set of marks consist of? 3. What is one of the ways of storing information in a computer? 4. What is a byte? 5. What is a bit? 6. How many bits does a byte usually contain? 7. What is an instruction? 8. By means of what is the computer told what operations to perform? 9. What are machine words? 10. What does a machine word consist of? 11. What are addresses? 12. What are reasonable operations? 13. What do mathematical operations include? 14. What do logical operations include? 15. In what system is information represented for the modern electronic computer? 16. What are the two basic types of words that are put into a memory?

**8. Translate the following sentences paying attention to the words in bold type:**

a) 1. What *kind* of computer was it? - It was a *digital* computer. 2. The computer can perform different *kinds* of operations. 3. This *kind* of logical problem is very simple. 4. Will you *kindly* explain to us the operation of this kind of machine? 5. Be so *kind*, show us the new equipment.

b) 1. As you already know logical relations in a computer are expressed by hardware. 2. As the ordinary business adding machine has the special equipment inside it, it can store information. 3. An electronic computer can add, subtract, multiply, and divide as well. 4. Natural sciences include mathematics, physics, chemistry, medicine, geology, biology, bionics, *as well as* the engineering sciences and other fields of knowledge. 5. As our professor was speaking of the history of computers, he mentioned P.L. Chebyshev and his great inventions. 6. My friend works at a plant *as* an engineer.

c) 1. Progressive people everywhere in the world must fight *for* peace. 2. Yesterday we heard an interesting lecture on modern electronics which was arranged *for* the students. 3. He asked me *for* a book on microcomputers' organization. 4. The first computing machines were not reliable (надежный), *for* there were no good electrical units. 5. The instructions are placed inside the computer, *for* the computer itself can select the numbers of instructions.

**9. Read and translate the following sentences paying attention to the predicates in the Passive Voice:**

1. These digits are easily multiplied. 2. I was asked many questions about my work. 3. They were explained how to solve this problem on a computer. 4. The sequence of reasonable operations has been performed by the computer. 5. The new department of mathematics has just been opened. 6. Many books on computers' organization and architecture had been translated from Russian into English by the end of last year. 7. The experiments on the new microcomputer were being carried out during the whole month. 8. All the digits are recorded on the paper tape when addition is performed. 9. The new key adding machine was transferred into the next room yesterday. 10. The sequence of reasonable

operations is now being carried out by this microcomputer. 11. The conference was addressed by a well-known scientist. 12. The invention of computers was spoken of at the last lecture. 13. Modern personal computers are always looked at with interest. 14. Many new branches of industry have been developed in our country since World War II.

### 10. Give the correct definitions of the following terms:

- a) information      c) bit      e) word      g) reasonable operations  
 b) binary system      d) byte      f) address

## UNIT 5 Kinds of Computers

### Vocabulary

regardless –несмотря на,  
 независимо  
 to enter -вводить

a routing–маршрутизация,  
 направление  
 direct -  
 направлять  
 property- свойство,  
 характеристика,  
 особенность

to modify-  
 изменять

solely-исключительно,  
 единственно, только  
 to monitor –проверять,  
 наблюдать

a hardware –аппаратные  
 средства

peripheral-внешний,  
 периферийный

a variety-многообразие,  
 вид

to afford- позволить, предоставить

an occurrence [ə'kʌrəns] - явление,  
 случай

to afford-позволять,  
 обеспечивать

to confine-  
 ограничивать

to fit-подходить,  
 приспособлять

representative-представитель

available-доступный

to purchase-покупать,  
 приобретать

a competitor-конкурент

incredibly-невероятно

to convince [kən'vɪns] -убеждать

solely ['səʊli] – только,  
 исключительно

counterpart ['kaʊntəpɑ:t] -копия

## 1. Read and translate the text

All computer systems, regardless of their size, have the same four hardware components:

1. *A processor or CPU*, where the data input is processed according to the program.
2. *Input/output devices* or peripherals such as the keyboard and printer, which receive data from people and enter it into the computer for processing, then send it back to people so it can be used.
3. *Storage components* such as disk drives or tape drives keep data for later use.
4. *Routing and control components*, which direct the instructions and/or data from one component to the next making sure each does its task properly.

Computers are generally classified as general-purpose or special purpose machine. *A general-purpose computer* is one used for a variety of tasks without the need to modify or change it as the tasks change. A common example is a computer used in business that runs many different applications.

*A special-purpose computer* is designed and used solely for one application. The machine may need to be redesigned and certainly reprogrammed, if, it is to perform another task. Special-purpose computers can be used in a factory to monitor a manufacturing process; in research to monitor seismological, meteorological and other natural occurrences; and in the office.

So all computers have in common, but certain computers differ from one another. These differences often have to do with the way a particular computer is used. That is why we can say there are different types of computers that are suited for different kinds of work or problem solving.

*Personal computer* is a computer system that fits on a desktop that an individual can afford to buy for personal use, and that is intended for a single use.

Personal computers include desktops, laptops and workstation. Each type of a personal computer shares many characteristics in common with its counterparts, but people use them in different ways.

*Desktop personal computers* are used for education, running a small business, or in large corporation, to help office workers be more productive.

*The Laptop Personal Computer* is a computer that people can take with them, laptop is used by a single individual but can be used in many different places, it is not confined by its size or weight to a desktop. It has the same components as a

desktop machine but in most cases the monitor is built in. The printer is usually separate.

*The Workstation* is a computer that fits on a desktop, but is more powerful than a desktop computer. The workstation has a more powerful microprocessor, is able to service more than one user, has an easy to use interface and is capable of multitasking. While these three characteristics used to be unique to workstation, they are being adapted to the more powerful 386 and 486 personal computers over time.

Workstations are designed for three major tasks: scientific and engineering, office automation and education.

*The Minicomputer*, or mini, is a versatile special or general-purpose computer designed so that many people can use it at the same time. Minis operate in ordinary indoor environments; some require air conditioning while others do not. Minis also can operate in less hospitable places such as on ships and planes.

Like all computers, the minicomputer is designed as a system. CPUs, terminals, printers and storage devices can be purchased separately. Mini systems are more mobile, easier to set up and install. A minicomputer system combined with specialized equipment and peripherals is designed to perform a specific task. A popular minicomputer is the Digital VAX Computer.

Mainframe is the largest general-purpose computer. It is designed to be used by hundreds even thousands of people. A mainframe uses the same basic building blocks of a computer system: the CPU, various I/O devices and external memory.

## **2. Agree or disagree with the following statements (It's false, It's true):**

1. Computers are generally classified as general-purpose or special purpose machine.
2. Input/output devices receive data, enter it into the computer for processing, then send it back to people so it can be used.
3. Storage components don't keep data for later use.
4. A special-purpose computer is designed and used for many applications.
5. A special-purpose computer may need to be redesigned and certainly reprogrammed.
6. Personal computers include desktops, laptops and workstation.

## **3. Ask questions to which the following statements might be the answer:**

1. Desktop personal computers are used for education, running a small business or in large corporation to help office workers be more productive.
2. Laptops fall into the same general categories as desktop personal computers.
3. The workstation is a computer that fits on a desktop.

4. Workstations are designed for three major tasks.
5. A minicomputer system combined with specialized equipment and peripherals is designed to perform a specific task.
6. A mainframe uses the same basic building blocks of a computer system: the CPU, I/O devices and external memory.

**4. Answer the following questions:**

1. What have all computers in common?
2. How can we classify computers?
3. What are general /special-purpose computers used for?
4. What are three primary types of personal computers?
5. What is the primary difference between personal computer and workstation?
6. What are major tasks of a workstation?
7. What is minicomputer used for?
8. What does the special-purpose computer differ from the general-purpose computer?
9. What are desktop personal computers used for ?

**5. Find the synonyms to the following words:**

*a component, a device, to receive, to enter, to keep, to handle, only*

*to run, to confine, to fit, terminals, calculation*

**6. Find the antonyms to the following words:**

*to pay attention to, unprocessed, undirect, monotony, designed*

*programmed, similar, similarity, unlimited, unite, rare, single, task*

*together, slow, odd, number, simplicity, to destroy*

**7. Match the words of the first column with those of the second one:**

1. regardless	a. убеждать
2. to enter	b. проверять, отслеживать
3. a routing	c. покупать
4. to direct	d. ограничивать
5. to modify	e. вводить
6. to purchase	f. изменять
7. to convince	g. маршрутизация, направление
8. solely	h. независимо от, несмотря на
9. to monitor	i. ладонь
10. occurrence	j. предоставить, позволить

11.to afford	к. исключительно, только
12.to confine	л. направлять
13.a palm	м. случай

### 8. Give the definitions to the following terms:

- |                             |                             |
|-----------------------------|-----------------------------|
| 1. computer                 | 5. personal computer        |
| 2. minicomputer             | 6. workstation              |
| 3. special-purpose computer | 7. mainframe                |
| 4. general-purpose computer | 8. Laptop Personal Computer |

## UNIT 6 Input and Output Devices

### Vocabulary

issuing commands-

выдача команд

a desktop-

рабочий стол

to install-

устанавливать

a keypad-

клавиатура

to utilize-использовать,

применять

a beam-луч

a strip-

полоса

a pin –контакт, штифт

a wedge [wedʒ]-клин

a dot-точка

to slide-скользить

an auxiliary storage [ɔ:g'ziljəri]-  
дополнительная(вспомогательна  
я) память

to attach-прикреплять

non-impact-не влияет

density-плотность

to insert-вставлять,

вводить

a double-удвоение

a seal –печать,

уплотнение

a slot-прорезь, отверстие,

пазл

to delete-удалять

hardcopy – печатная копия

sharpness - четкость

a track-путь,

трасса

CPU-центральный процессор

softcopy – в электронном виде

trackball - трекбол, шаровой  
манипулятор

a dot-matrix printer – матричный принтер

a peripheral- периферийное  
устройство

letter quality printer- печатающее  
устройство с типографским качеством  
печати  
computational [kəm'pjʊ'teɪʃnəl]-  
вычислительный

an ink jet printer –струйный  
принтер

to be of use to -быть полезным

## 1. Read and translate the text

A peripheral is a device that performs input, output or storage functions and is connected to CPU. In order for the computer to be of use to us, there must be some types of mechanism for entering data into the computer for processing. Devices which allow the task of data entry to be performed are called input devices.

Input we use to perform the two basic computational tasks: data entry and issuing commands. The most widely used input device is the keyboard, which was adapted from the typewriter. The keyboard itself doesn't contain any mechanism for creating printed pages. Each time a key on the keyboard is pressed, an electronic signal is sent to the system unit indicating which key was pressed. The system unit and the software interpret this signal and take the appropriate action.

Some keys are added to terminal keyboards to fulfill special functions. The most important of these is the RETURN or ENTRY key. This is pressed by the user to indicate to the computer, by the sending of a special code, that the typed line is complete and that the computer can now analyze it. Other keys that may be present include a delete key which when pressed deletes the character just typed, special function keys that can be used for special purpose by different programs and one marked CONTROL or CTRL which also has a particular function when used with other keys. Some keyboards may also have a numeric keypad to the right of the typewriter keyboard. This may be of help when entering numeric data.

There are three keyboard layouts. The first is the standard IBM-PC keyboard. The central portion of the keyboard consists of the alphanumeric keys, that there are ten function keys (labeled F1 – F10) on the top side of the keyboard, and there is a numeric keypad, much like that found on a calculator, on the right side of the keyboard.

The function keys are keys which send special signals to the system unit. The effect of pressing a given function key will depend on the software which is currently in use.

The numeric keypad is useful when numeric data must be entered into the computer. The numeric keypad serves two roles. The 1st role is the digits, decimal points and addition and subtraction signs are active. The 2nd role is the key of the keypad are used to control the small blinking box or line on the screen which shows the user where the next typed character will be displayed. This line is known as the cursor. The cursor control keys are the arrows (left, right, up and down),

PgUp (page up), PgDn(page down), Insert and Delete. But there are several types of pointing device that are used to move the cursor and usually work in conjunction with the keyboard. The most common pointing device is the mouse, so called because it slides over the desktop and has a wire or 'tail' attached to the computer.

When referring to hardware, a scanner or optical scanner is a hardware input device that optically "reads" an image and converts it into a digital signal. For example, a scanner may be used to convert a printed picture, drawing, or document (hard copy) into a digital file which can be edited on a computer.

Another pointing device is a trackball, which performs like a stationary upside-down mouse. A joystick is another pointing device, one that is usually associated with playing computer games.

An output device is a piece of computer hardware that receives data from a computer and then translates that data into another form. That form may be audio, visual, textual, or hard copy such as a printed document. There are four different categories of output device: visual, data, print, and sound.

Monitors and printers are two of the most commonly used output devices used with a computer. Most computer outputs come in two forms: text and graphics.

Printers are output devices which produce hardcopy. Printers come in all kinds of shapes and sizes, with varying capabilities and mechanisms for printing. There are different types of printers: a letter quality printer and a laser printer, an ink jet printer.

A laser printer provides high-quality non-impact printing and offers the highest quality texts and graphics printing for the desktop. A letter quality printer allows the production of documents with a high quality of printing at a relatively low cost. Like lasers, Ink jet printers are able to print many different types of fonts and graphics.

The key distinction between an input device and an output device is that an input device sends data to the computer, whereas an output device receives data from the computer.

## **2. Translate into Russian:**

1. input, output or storage
2. to be of use to us
3. basic computational tasks
4. the standard mean
5. interpret the signal
6. numeric keypad
10. a stationary upside-down
11. without human intervention
12. less bulky
13. naked eye
14. spraying a fine jet of ink
15. fonts and graphics

7. central portion
8. small blinking box
9. small rotating ball embedded in the bottom

16. direct and sequential access
17. flexible, plastic envelope

### 3. Translate into English:

- |   |                                      |
|---|--------------------------------------|
| 1. устройство ввода   | 10. курсор                           |
| 2. устройство вывода  | 11. легко передвигается по столу     |
| 3. клавиатура   | 12. необходимо нажать 1 или 2 кнопки |
| 4. результативные команды   | 13. двойной щелчок                   |
| 5. печатающее устройство с типо-<br>типографским качеством печати | 14. удалить                          |
| 6. выполнять специальные функции                                  | 15. соединенный с помощью кабеля     |
| 7. слева  | 16. труйный принтер                  |
| 8. справа   | 17. четкость изображения             |
| 9. следующий напечатанный символ                                  |                                      |

### 4. Fill in the prepositions:

1. A keyboard was adapted ..... the typewriter.
2. Special function keys can be used ..... special purpose ..... different programs.
3. There are 10 function keys ..... the top side of the keyboard.
4. Numeric data must be entered ..... the computer.
5. Joystick is usually associated ..... playing computer games.
6. A scanner permits entering text ..... a computer.
7. Vacuum tube is used to generate the display ..... most monitors.
8. Micrographics is a way to store output ..... film.
9. Floppy disks are divided ..... two sizes of portable magnetic disks.
10. The capacity of disks is determined by the density ..... which the metal particles are placed ..... the disk.

### 5. Find the synonyms to the following words:

a unit, a memory, a device, to permit, to correspond (to)  
input/ output, to erase, a part, to direct, to slip, to insert  
to transfer, to diverse, to short, to use

### 6. Find the antonyms to the following words:

to forbid, narrow, a main unit, hardly, to forget, dull  
to separate, to enter commands, without results, inappropriate  
to release, top, rouge, to store, a thick beam, beginning  
lower speed, hard disk, inconstant, soft copy, impact  
printing, low quality, expensive, to pollute

## 7. Give the definitions to the following terms:

1. input device
2. output device
3. a keyboard
4. a mouse
5. a scanner
6. trackball
7. a joystick
8. a laser printer
9. a letter quality printer
10. an ink jet printer.
11. a peripheral

## 8. Answer the following questions:

1. What is the peripheral?
2. What can input units perform? Name the input units. Give them short characteristics.
3. What can the output units perform? Name them and give them short characteristics.
4. What can you say about keyboard layouts ?
5. How many types of printers do you know?

## 9. Write the plan for retelling.

## 10. Retell the text.

## UNIT 7 Central Processing Unit and Arithmetical Logical Unit (CPU and ALU)

interchangeably-взаимозаменяемо  
to retrieve –извлекать, возвращать  
a reference -ссылка, справочник  
a portion[рə:ʃn]-часть, доля

a flow -поток  
a counter -счетчик  
the arithmetical-logical unit (ALU)-  
арифметико-логическое устройство  
(АЛУ)  
step-by-step operation- пошаговые  
операции  
exponentiation- [ekspənenʃi'eɪʃn] —  
возведение в степень

a decoder-декодирование  
timing mark-отметка времени  
a bank-банк  
a bistable device-бистабильное  
устройство  
an adder['ædə]-сумматор  
refer to-относиться  
central processing unit (CPU)-  
центральный процессор (ЦП)  
on the other hand — с другой стороны  
to select [sə'lekt] — выбирать,  
выделять (на экране)

## 1. Read and translate the text

It is common practice in computer science for the words 'computer' and 'processor' to be used interchangeably. More precisely, 'computer' refers to the central processing unit (CPU) together with an internal memory. The internal memory, control and processing components make up the heart of the computer system. Manufacturers design the CPU to control and carry out basic instructions for their particular computer.

In digital computers the CPU can be divided into two functional units called the control unit (CU) and the arithmetical-logical unit (ALU). These two units are made up of electronic circuits with millions of switches that can be one of two states, either on or off.

The function of the control unit within the central processor is to transmit coordinating control signals and commands. The control unit is that portion of the computer that directs the sequence or step-by-step operation of the system, selects instructions and data from memory, interprets the program instructions, and controls the flow between main storage and the arithmetical-logical unit.

A control unit has the following components:

- a) a counter that selects the instructions, one at a time, from the memory;
- b) a register that temporarily holds the instruction read from memory while it is being executed;
- c) a decoder that takes the called instruction and breaks it down into individual commands necessary to carry it out;
- d) a clock, which while not a clock in the sense of a time-keeping device, does produce marks at regular intervals.

This timing marks are electronic and very rapid.

The arithmetical-logical unit (ALU) is that portion of the computer in which the arithmetical operations, namely, addition, subtraction, multiplication, division and exponentiation, called for in the instructions are performed.

Programs and the data on which the control unit and the ALU operate, must be in internal memory in order to be processed. Thus, if located on secondary memory devices such as disks or tapes, programs and data are first loaded into internal memory.

The primary components of the ALU are banks of bistable devices, which are called register. Their purpose is to hold the numbers involved in the calculation and hold the result temporarily until they can be transferred to memory.

At the core of the arithmetical-logical unit is a very high-speed binary adder, which is used to carry out at last the four basic arithmetical functions (addition, subtraction, multiplication and division).

Typical modern computers can perform as many as one hundred thousand additions of pairs of thirty-two binary numbers within a second.

The logical unit consists of electronic circuitry, which compares information and makes decisions based upon the result of the comparison. The decisions that can be made are whether a number is greater than, equal to, or less than another number.

## **2. Find English equivalents in the text:**

1. более точно
2. внутренняя память
3. управлять и обрабатывать
4. сердце компьютерной системы
5. выполнять основные инструкции
6. миллионы переключателей
7. передавать контрольные сигналы
8. часть компьютера
9. счетчик, который выбирает инструкции
10. временно удерживать
11. переделывать (переводить) инструкции в индивидуальные команды
12. устройство, которое показывает время
13. возведение в степень
14. загружать
15. сравнение

## **3. Give Russian equivalents to the following words and expressions:**

1. common practice
2. to be used
3. manufactures design the CPU
4. can be divided into two functional units
5. are made up of electronic circuits
6. to transmit coordinating control signals
7. the sequence or step-by-step operation
8. to interpret the program instructions
9. the flow between main storage and the ALU
10. one at a time
11. is being executed
12. rapid
13. in order to be processed
14. secondary memory device
15. involved
16. within a second

## **4. Fill in the blanks necessary words and prepositions:**

1. More precisely, 'computer' refers ..... the central processing unit.
2. The CPU can also ..... information from memory and can ..... the result of manipulations back into ..... unit ..... later reference.
3. The control unit is that portion of the computer that ..... the sequence operations of the system, selects ..... and data ..... memory and controls the flow ..... main storage and the ALU.
4. Programs and the data on which the control unit and the ALU operate, must be in ..... to be processed.
5. At the core of the arithmetical-logical unit is a very high-speed.
6. Modern computers can ..... more than one hundred thousand additions ..... thirty-two bits within a second.
7. It is common practice in computer science ..... the words 'computer' and 'processor' to be used.

**5. Find in the text synonyms to the following words:**

to define, to put in, to order, among, choice  
to be situated, to fulfill, main, couple, part

**6. Find in the text antonyms to the following words:**

external, to join, secondary, particular, unchangeable, to take  
to give, permanently, unnecessary, irregular, more, original

**7. Answer the following questions:**

1. Where does the word 'computer' refer to?
2. How can the CPU in digital computers be divided?
3. What is the function of the control unit?
4. What components has a control unit?
5. What is the arithmetical-logical unit?
6. Where are programs and data first loaded?
7. What are the primary components of the ALU?
8. What can modern computers perform?

**8. Retell the text in English.**

**9. Retell the text.**

## UNIT 8 Computer Memory

### Vocabulary

auxiliary [ɔ:g'zɪljəri] - вспомогательный, дополнительный	a repository [rɪ'pɒzɪtəri] – хранилище, хранилище данных
aid [eɪd] - помогать	to involve [ɪn'vɒlv] - касаться, затрагивать
to run [rʌn] - запускать	ROM [rɒm] (read only memory) - ПЗУ (постоянная память)
RAM [ræm] (random access memory) - ОЗУ (Оперативная память)	disk drive [dɪsk draɪv] - дисковод
to direct [dɪ'rekt] - направлять, управлять	firmware ['fɜ:mweə] – встроенные программы
to assist [ə'sɪst]- помогать	to execute ['eksɪkjʊ:t] -выполнять
Volatile memory ['vɒlətaɪl 'meməri] - энергозависимая память	supplement ['sʌplɪmənt] – дополнение, приложение
to handle- обрабатывать	to hold- хранить

### 1. Read and translate the text

Software gives instructions that tell computers what to do. There are two kinds of software. The first is System Software and includes programs that run the computer system or that aid programmers in performing their work. The second kind of software is Application Software, which directs the computer to perform specific tasks that often involve the user.

Memory is the general term used to describe a computer system's storage facilities. Memory's job is to store the instruction or programs and data in the computer. Memory can be divided into two major categories: 1. main memory, 2 auxiliary storage. Main memory is also called main storage, internal storage or primary storage and is a part of the CPU. Main memory is usually on chips or a circuit board with the other two components of the CPU. RAM for Random Access Memory, is the storage area directly controlled by the computer's CPU. Main Memory assists the control unit and the ALU by serving as a repository for the program being executed and for data as it passes through. RAM or Volatile memory so called because its contents are replaced when new instructions and data are added, or when electrical power to the computer is shut off. RAM is read-write memory, in that it can receive or read data and instructions from other sources such as auxiliary storage.

Another type of memory is ROM or Read Only Memory. ROM holds instructions that can be read by the computer but no written over. ROM is sometimes called firmware because it holds instructions from the firm or manufacturer.

Auxiliary storage, also called auxiliary memory or secondary storage, is memory that supplements main storage. This type of memory is long-term, Nonvolatile Memory. Nonvolatile means that computer is turned off or on.

**2. Fill in the blanks necessary words:**

1. .... gives instructions that tell computers what to do.
2. .... directs the computer to perform specific tasks that often involve the user.
3. Memory’s job is to store .....
4. .... can be divided into two main categories.
5. Main memory is usually on .....
6. .... is read-write memory.
7. .... holds instructions that can be read by the computer but no written over.
8. .... is memory that supplements main storage.
9. .... means that the computer is turned off or on.

**3. Fill in the prepositions:**

1. Memory can store instructions, programs, data ..... the computer.
2. Main memory is usually ..... chips or a circuit board ..... the other two components of the CPU.
3. RAM ..... random access memory is the storage area controlled ..... the computer’s CPU.
4. Memory so called because its contents are replaced, when instructions are added or when electrical power is shut .....
5. ROM holds instructions that can be read, but no written .....

**4. Find the synonyms to the following words:**

1. a storage device	a. to process
2. to perform	b. a part
3. to handle	c. to transfer
4. a portion	d. to hold
5. to transmit	e. additional
6. to store	f. to execute
7. a routing	g. a memory
8. to assist	h. a rout
9. auxiliary	i. to aid

**5. Find the antonyms to the following words:**

1. to take away	a. Nonvolatile
2. to break down	b. long-term
3. secondary	c. internal
4. external	d. include
5. old instructions	e. create
6. switch on	f. primary
7. short-term	g. new instructions
8. Volatile	h. switch off

### 6. Are these statements false or true?

1. The second kind of software is Application Software, which directs the computer to perform specific tasks that seldom involve the user.
2. Software gives instructions that tell computers what to do.
3. Memory is the general term used to describe data processing facilities.
4. The Software as most intangible products is not always capable of being readily evaluated.
5. Volatile memory isn't replaced when new instructions and data are added.
6. Firmware holds instructions from the computer.
7. RAM or Volatile memory so called because its contents aren't replaced when new instructions and data are added.

### 7. Give the definition to the following terms:

- |                |                       |
|----------------|-----------------------|
| 1. software    | 5. ROM                |
| 2. RAM         | 6. volatile memory    |
| 3. memory      | 7. auxiliary memory   |
| 4. main memory | 8. nonvolatile memory |

### 8. Answer the questions:

1. Does software give instructions that tell computers what to do?
2. How many kinds of software do you know? What are they?
3. When do you use the term 'memory'?
4. What is the job of memory?
5. Can you name two major categories of memory?

### 9. Retell the text.

## UNIT 9 Application Programs

### Vocabulary

an application program- прикладная

Computer Aided Design (CAD)-

программа	компьютеризированное конструирование
accounting [ə'kaʊntɪŋ]- бухгалтерский учет	to scatter ['skætə] - засеять, рассыпать
drafting ['dra:ftɪŋ]- редактирование	a cabinet ['kæbɪnɪt] шкафчик, шкаф
Database Management ['deɪtəbeɪs 'mænɪdʒmənt]- управление базой данных	a folder ['fəʊldə] папка
spreadsheet ['spredʃi:t]- электронная таблица	schematic [ski'mætɪk] схематический, схемный
to gain [geɪn]-получать, достигать	via ['vaɪə] через, посредством
word processing [wɜ:d 'prəʊsesɪŋ]- обработка текстов	enhance [ɪn'hɑ:ns] повышать, увеличивать, улучшать
to create [kri'eɪt] создавать, формировать	brochures ['brəʊʃ(ə)ə] брошюра, рекламный проспект, каталог
to edit ['edit]- редактировать	desktop Publishing ['desktp'ɒblɪʃɪŋ] настольные издательские средства, НИС
to finance [faɪ'næns]- финансировать	Computer Aided Design (CAD) компьютеризированное конструирование
charts [tʃɑ:t] таблицы	to scatter ['skætə] - засеять, рассыпать

## 1. Read and translate the text.

*An Application Program* is a software program that performs a specific function, such as accounting, word processing or drafting. There are some categories of application program to choose from spreadsheet, Database Management, Computer Aided Design (CAD), Communications, Graphic presentations, desktop Publishing, Integrated Programs, Window and Windows – based Programs. Within each category, there are several software programs which have gained industry-wide acceptance.

Word processing: is the most common application for a personal computer. Most word processing software programs allow us to create, edit, and save documents, along with changing the position of the text in a document, inserting new information in the middle of the text, or removing words and sections no longer needed. With a typewriter, you would have to re-type the entire document after a few major changes. Given a computer, a document can be stored electronically and retrieved at any time for modification.

*Accounting and spreadsheets*: One of the primary functions of the first mainframe computers was to store and calculate volumes of financial data for banks and large

businesses. Nowadays, a personal computer is capable of handling the accounting and finances of almost any small to medium-sized business. Many different programs are available for plotting financial trends and performing everyday bookkeeping functions. One of the most popular financial tools is called a spreadsheet. An electronic spreadsheet is a software program, which performs mathematical calculations and 'what – if' analysis. Besides replacing your pencil and calculator for solving financial and statistical problems, spreadsheets can display line graphics, bar charts, and scatter plot diagrams. Often accounting and spreadsheet programs are designed to work together, in efforts to provide the financial solution.

*Database Management.* A database is a simply collection of related information. Some common examples are a phone book, an inventory list, a personal file. A Database Management Software program assists in manipulating and organizing the information in a database. A database application is any task ordinarily handled by a filing cabinet, multiply file folders, or some other information storage system. In a manual system, for example, each drawer in filing cabinet is reserved for a specific purpose, such as maintaining profile sheets on customers. Each profile is written on a standard form and a clerk places the file folder in the drawer. This manual process is identical to a computerized database, where the database software performs the function of the filing clerk. Rather than placing the customer profiles in the filing cabinet drawer, a computerized database stores each profile electronically on a disk.

*Computer Aided Design.* Computers are the perfect tools for creating drawing or architectural plans. Because the drawings can be saved, it is easy to incorporate modifications, design improvements and corrections. Computers are often used on the final process of converting a computer drawing into a physical product. One such example is the manufacturing of electronic circuit boards. First, the electronic circuit drafting program produces the schematic design, then a second program tests the design by simulating the circuit's operation, and finally a third program constructs the circuit board from the design layout.

*Communications:* Computers can communicate with each other via regular telephone lines and modems. Communication software programs enable different types of computers to exchange data using a common language. The IBM PC can actually emulate various types of equipment, around the world, with the help of software.

*Graphic Presentations:* There are actually some people, who prefer to look at 14 columns of numbers across several pages for analyzing a business' performance. These people are called accountants. However, most people are visual learners of diagrams, graphs and charts for representing numerical trends..

Desktop Publishing is the process of taking a document and inserting graphics and applying enhanced formatting options. These programs take text from the more common word processor and produce print-shop quality output. Desktop publishing programs are used to create newsletters, brochures, reports, book and other publications.

Desktop publishing programs include: Aldus PageMaker, Ventura Publisher, AMI Professional. Integrated Programs: they unite one or more of the primary computer applications, whether word processing, spreadsheet or database into a single package. These programs allow people to experiment with the major computer applications, while only investing in a single product.

*Microsoft Windows.* Windows is a program, which enhances many aspects of using a microcomputer. It provides a graphical user interface (GUI and pronounced «Gooney») for programs running under the Windows environment. In other word, Windows allows a person to use a mouse and choose special symbols to point at and select desired functions, rather than having to remember commands. As well Windows' products allow a WYSIWYG ('what you see is, what you get') screen display, especially important for word processing and desktop publishing programs.

## **2. Translate into Russian:**

- |  |   |
|--|---|
| 1. software program                    | 8. bookkeeping functions                                    |
| 2. application program                 | 9. to assist in manipulating and organizing the information |
| 3. industry-wide acceptance            | 10. perfect tools   |
| 4. along with changing the position    | 11. program tests the design                                |
| 5. no longer needed                    | 12. emulate various types                                   |
| 6. to re-type the entire document      | 13. select desired functions                                |
| 7. calculate volumes of financial data |   |

## **3. Find English equivalents to the following words and expressions in the text:**

- |  |  |
|--|--|
| 1. выполнять специфическую функцию               | 8. быть способным, быть в состоянии что-либо выполнять |
| 2. самая распространенная прикладная программа   | 9. ручной процесс                                      |
| 3. создавать, редактировать, сохранять документы | 10. пласт  |
| 4. вставлять новую информацию                    | 11. используется, чтобы создать                        |
| 5. удалять слова, которые больше не нужны        | 12. позволяет людям экспериментировать                 |
| 6. может сохраниться электронно                  | 13. выбрать  |
| 7. получить в любое время                        |  |

**4. Finish the sentences according to the text.**

1. An application program is a software .....
2. Word processing software programs allow us .....
3. An electronic spreadsheet is a .....
4. A data base application is any task .....
5. Computers are perfect tools for .....
6. Communication programs enable different types of computers .....
7. There are some people who prefer to look at 14 columns of numbers across several pages for .....
8. These programs take text from the more common word processor and .....
9. Windows allows a person .....

**5. Give appropriate definitions and examples of the following application programs:**

- |                                |                          |
|--------------------------------|--------------------------|
| 1. word-processing             | 5. communications        |
| 2. accounting and spreadsheets | 6. graphic presentations |
| 3. database management         | 7. desktop publishing    |
| 4. computer aided design       | 8. Microsoft Windows     |

**6. What kind of programs do you choose to perform the following tasks:**

<b>tasks</b>	<b>program</b>
1. to create, edit and save documents;	
2. to make a phone book, inventory list, a personal file;	
3. to store and calculate volumes of financial data for banks;	
4. to use a mouse and choose special symbols to point at and select desired functions;	
5. to create drawings or architectural plans;	
6. to communicate with other persons via regular telephone to exchange data using a common language;	
7. to unite one or more of the primary computer applications.	

**7. Answer the questions:**

1. What is an application program?
2. What does word processing software program allow to do?
3. What was one of the primary functions of the first mainframe computers?

4. What is a personal computer capable doing now?
5. What is spreadsheet?
6. What is database?
7. What are the perfect tools for creating drawings?
8. What are desktop publishing programs used to?
9. What is windows?

**8. Give a short summary of the text.**

## UNIT 10 Programming Languages

### Vocabulary

flipping toggle-переключение тумблера	a source-источник
awkward ['ɔ:kwəd]-трудный	to issue ['ɪʃuː]-выдавать
to comprise -включать, составлять, содержать,	a compiler –компилятор, составитель
to declare-объявлять	ambiguity [æmbɪ'gju:ɪti]-неоднозначность
a notation- система обозначений, форма записи	to retrieve-извлекать
execute ['eksɪkjʊ:t] -выполнять, исполнять	preserve [prɪ'zɜ:v]-сохранять
preserve- [prɪ'zɜ:v] сохранять	a high-level language- язык высокого уровня
statement - заявление, утверждение	searching for a better- в поисках лучшего
correspond-соответствовать	greater ease in writing- большая легкость в написании

**1. Read and translate the text.**

*Programming* has been with us for over 40 years but it wasn't born at the time as the first computers. When the first early computers were built, there were no programming languages. First machines were initially programmed by flipping toggle switches and changing cables. Needless to say, this was a slow, awkward process. People began quickly searching for a better, faster way to issue instructions to the computer.

The result was what we call *Programming Languages*. The programming languages fall into three general categories. They are comprised of ones and zeros,

and are directly understood or executed by hardware. Electronic circuitry turns these 0s and 1s into the operations the computer performs.

*Assembly Languages* are powerful programming tools because they allow programmers a large amount of direct control over the hardware. They offer programmers greater ease in writing instructions but preserve the programmer's ability to declare exactly what operations the hardware performs. Assembly languages are machine-specific, or machine-dependent. Machine-dependent means the instructions are specific to one type of computer hardware. Assembly languages are still provided by most computer manufacturers – they can't be translated and used on another computer. Assembly languages are used by systems programmers to develop operating systems and their components.

So Assembly languages were the first bridge between the English Language and the computer's binary language. The creation of high-level programming languages followed. A high-level language is a language in which each instruction or statement corresponds to several machine code instructions.

As high-level languages are a method of writing programs using English like words as instructions, they allow users to write in a notation with which they are familiar, e.g., Fortran in mathematical notation, Cobol in English.

*High-level programming languages* combine several machine language instructions into one high-level instruction. Low-level languages required only a single letter or a short mnemonic a term, or a word that is easy to identify, such as ADD for addition. High-level language requires just a single statement.

*FORTTRAN* was created in 1954 by John Backus. And it was one of the first high-level languages for FORMular TRANslator. Fortran allows programmers to calculate complex formulas with a few source code instructions. It is used for scientific and mathematical problems. The source program is written using combination of algebraic formulas and English statements of a standard but readable form.

Another high-level machine language is *Cobol*. Cobol was developed by the Conference on Data Systems Languages. Cobol was issued by the US Government Printing Office in 1960. Cobol stands for Common Business-Oriented Language. The source program is written using statements in English. It was made for business industry, government and education applications. This means that Cobol «has a place for everything» and requires programmers to «put everything in its place».

*Algol* was developed as an international language for the expression of the algorithms between individuals, as well as programming language. It was introduced in the early 1960s. Algol stands for ALGORithmic Language. This language is used for mathematical and scientific use. An Algol program consists of

data items, statements and declarations, organized into a program structure BASIC or the Beginners AU-purpose Symbolic Instruction Code, was developed over a period of years by professors John Kemeny and Thomas Kurtz and students in the computer science program at Dartmouth College. It was released in 1965. In most versions, *BASIC* is an unstructured language. The original Basic was easy to learn allowing computer users to write simple programs within a few minutes.

Basic uses five major categories of statements:

- Arithmetical statements allow users to use Basic like a calculator
- Input/ Output statements, including READ, DATA, INPUT and PRINT
- Control statements including GOTO, IF-THEN, FOR, NEXT and END control the sequence of instructions executed by the computer
- Other statements help document Basic programs and set up data dimensions respectively
- System Commands tell the operating system how to work with Basic programs

RUN means execute a program

LIST directs the computer to display a Basic program.

## **2. Fill in the prepositions:**

1. Programming has been ..... us for over 40 years.
2. People began searching ..... a better, faster way to issue instructions to the computer.
3. They offer programmers greater ease ..... writing instructions.
4. Assembly languages were the first bridge ..... the English Language and the computer's binary language.
6. FORTRAN was created in 1954 ..... John Backus.
7. It was made .....business industry, government and education applications..

## **3. Find the synonyms to the following words:**

*to execute, a tool, to allow, to preserve a notation, to issue, to differ*

## **4. Find the antonyms to the following words:**

*to die, to be destroyed, important, slowly, indirectly, difficulty*

*low level, unfamiliar, high level, to unite*

## **5. Give appropriate definition of the following terms:**

1. programming languages
2. Assembly Language
4. Algol
5. Basic

### 3. Cobol

#### 6. Answer the questions:

1. How were the first computers programmed?
2. What is an example of assembly language?
3. What does the term machine-dependent mean?
4. What is an assembly language primary used for?
5. What is a high-level language?
6. What does it combine?
7. What is a statement/syntax?
8. When was FORTRAN created? What is Fortran?
9. When was Cobol created? What is Cobol?
10. How many sections is Cobol separated into?
11. What is Algol (when was it developed and for what)?
12. What is Basic?
13. What are major categories of Basic?

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