**Перевод текста**

**Text 3(A). What is Computing?**

Suppose you sit down with pencil and paper and center your attention on adding figures. You add first all the digits in the right-hand column, then all the digits in the next column, and so on – until you finally arrive at the answer¹. When you do this, you are computing.

When you stop at a street corner, looking first to the left for any coming car, then to the right, to cross the street or to wait on the sidewalk²– you are computing.

When you are walking along a poorly marked path³ in the woods, thinking if you are really on the path or have lost it4– you are computing.

When you are taking in information or data, performing reasonable operations (mathematical or logical) on the data, and are producing one or more answers – you are computing.

A machine can also do this. It can take in information or data, perform a sequence of reasonable operations (последовательность разумных операций) on the information which it has received, and put out answers. When it does this, it is computing.

A very simple example of a computer is the ordinary business adding machine which prints on paper tape the number entered into its keyboard, and also prints a total when you press the total key. A complex example of a computer is a modern automatic digital computer which in each second can perform more than 100,000,000,000 additions, subtractions, multiplications, or divisions.

A computing machine can take in and store information because the hardware inside the machine expresses arithmetical and logical relations, such as adding or subtracting, comparing or selecting. A computer can also put out information, display the answers when it receives them. Hardware is useless without software which is computer instructions and programs.

The modern computers are of three kinds called analog, digital, and hybrid. An analog computer computes by using physical analogs of numerical measurements. A digital computer computes by using numbers (digits) and yes’s and noes expressed usually in 1’s and 0’s 5. A hybrid computer is a machine which combines some of the properties of digital and analog computers.

NOTES:

¹ until you finally arrive at the answer – до тех пор, пока вы наконец не получите ответ

²a sidewalk – тротуар

**³**a poorly marked path – едва заметная тропинка

4 if you are really on the path or have lost it – действительно ли вы находитесь на тропинке или заблудились

5 yes’s and noes expressed usually as 1’s and 0’s – да и нет, выраженных обычно единицами и нулями

### Text 3(B). Electronic Computers

In the early 1940s the electronic computer was made with the mechanical

Relays replaced by vacuum tubes. These were, however, single-purpose computers designed to aid in the war effort.¹

The first general-purpose electronic computer was ENIAC (Electronic Numeric Integrator and Calculator) that was put into operation at the University of Pennsylvania in 1946 – a 30-ton machine that contained over 17,000 vacuum tubes and performed 100,000 operations per second (1 000 kilohertz, or kHz), 1 000 times slower than today’s mega hertz (MHz) chips.

With the invention of transistors in 1948, vacuum tubes that generated a great amount of heat were replaced by small transistors that functioned perfectly as switches² and generated little heat.

By 1953 there were only about 100 computers in the entire world. They were huge expensive machines. It was hard to imagine that one day machines that were hundreds of times smaller and thousands of times more powerful would occupy most homes and offices.

NOTES: ¹ to aid in the war effort - для помощи в военных действиях;

² switches - переключатели

**Text 3(C). Personal Computers**

The first integrated circuit for computers was developed in 1958. Only in 1971 was the microprocessor that contained all the basic elements of a computer on a single chip introduced, followed by desk-top computers in the mid-1970s.

Early computers were built as single-purpose machines, that is, they were built for performing a specific task. The first general-purpose ENIAC built in 1946 was programmable, but changing a program required rewiring¹ the machine!

The micromini computers of the 1970s and most in the 1980s followed the same pattern² and required extensive knowledge of common codes and function keys.

Apple Computer’s Macintosh revolutionized the personal computer industry with a new machine. The user no longer has to memorize an operating system command for loading a program or file. Programs, functions, and files are represented by icons or small graphic images that can be selected worth a mouse or other pointing device.

NOTES: ¹ rewiring – перепрошивать;

² followed the same pattern – следовали тому же образцу

**Text 3(D). Part of Computer System**

In order to use computers effectively to solve problems computer systems are devised. Computer systems may be discussed in two parts.

The first part is hardware – the physical, electronic, and electromechanical devices that are thought of and recognized as “computers”. The hardware consists of the Central Processing Unit (CPU), input devices and output devices. The CPU is made up of a processor and a main memory, or main store. The processor carries out, or executes, instructions in the program. The main memory stores input data and the program needed by the processor. The main memory also holds output data, or the results of processing.

Input devices are used to provide data for the CPU. The keyboard is a common data input device. By using a keyboard, a user can enter data directly into the computer system. Data is sometimes entered on cards or it is often input from a mass storage device, such as magnetic tape or magnetic disk. A mass storage device has a much larger capacity than main memory. That is, it can store more data. The tapes or disks are read by an input device called a tape drive or a disk drive.

Output devices receive data from the CPU. The Visual Display Unit (VDU) and printer are common output devices. The VDU is similar to a TV screen. The printer produces printed output on paper. Both the VDU and printer present output data for immediate use. Sometimes, the output data is transmitted along a telephone line to another computer. Output data can also be stored for future use on a mass storage device, such as magnetic tapes or disks.

Input and output devices as well as mass storage devices are collectively called peripherals.

The second part is software – programs that control and coordinate the activities of the computer hardware and that direct data processing.

For the computer system to operate, computer programs are required. A computer program is a set of instructions for the CPU. These instructions tell the CPU where to find the input data in the system. The CPU is also instructed how to process the data and where to put the results. Programs are not hardware, as they have no electrical or mechanical components. They can be easily changed according to the user’s needs.

Computer software can be divided into two very broad categories – system software and application software.

**Text 3(E). Programming**

The word “program” has come into use to refer to a sequence of instructions which a computer carries out. A program for a computer is an exact sequence¹ of instructions that it uses to solve a problem. It usually consists of subroutines or subprograms which are portions of it.

Programming for automatic computer requires a good deal of ² knowledge, common sense³, and training. Specially, programming requires: (1) understanding the operations of a business or the steps of a scientific calculations; (2) understanding the best way for having a computer carry out these operations and steps; (3) arriving at a good sequence of commands for the computer to solve the problem; and (4) adequately translating these commands into the computer language.

Programming for the computer has several forms. One form is the construction of compiling programs or compilers – which use the computer to take subprograms out of a library and link (соединять) them together appropriately (соответственно) so as to solve a new problem. A second form is the construction of programs called interpreters which accept instructions in certain standard words and translate theses words into a machine language, so that the machine “knows” what the words “mean”. A third form is the development of common languages for automatic programming for problems, so that any problem when expressed in such a language can be given to any other automatic computer, and the computer will translate the common language into its own instruction code, and then solve the problem.

NOTES: ¹ exact sequence – точная последовательность

² a good deal of – много

³ common sense - здравый смысл

**задания**

1. **Перепишите следующие предложения, подчеркните в них глагол-сказуемое, определите его время, вид и залог. Переведите предложения на русский язык.**

***Например: is based – Pr. Simple Passive***

1.Compound semiconductors have been applied to a great extent. 2. The performance characteristics of amplifiers will have been altered. 3. The model has been modified and is now being used in many practical situations. 5. Magnetic amplifiers have been employed for some 50 years; transistors were reported upon in 1948. 5. The problem will be dealt with in the next chapter. 6. Which of the two operations is to be performed next? 7. Spelling and grammar rules must be followed by those who learn a foreign language. 8. They left before the hour of the next meeting has been agreed upon. 9. She was being laughed at by everybody. 10. They say that paper must have been invented in China.

**2. Поставьте глагол-сказуемое в следующих предложениях в страдательном залоге, стараясь сохранить время.**

1.? killed thirty people and ? injured (травмировать, получать увечье) 65 in that terrible accident. 2. ? hid the treasure in a place which no one could find. 3. ? can't learn a foreign language in a few days. 4. The dog was mad and ? had to shoot it.

**3. Из данных слов постройте предложения. Глаголы в скобках поставьте в нужную форму страдательного залога.**

1. a few students – was (to do) – this exercise – correctly.
2. this book – a very young author – was (to write).
3. is being (to make) – his new suit – a first-class tailor.
4. the sun rays – is (to give) - to us – heat.
5. alone – often – was (to leave) – the child – home.

**4. Трансформируйте предложения в активный залог, используя слова *they, we, somebody* в качестве подлежащего, где это необходимо.**

1. Harry wasn't punished at all. 2. The problem will be dealt with in the next chapter. 3. They knew that the reason had been explained to us. 5. Today plastics are being widely used instead of metals.

**5. Перепишите и переведите на русский язык следующие предложения, обращая внимание на различные значения глаголов *to do, to be, to have.***

1. Don't come at 9 o'clock. 2. Did he do his work well? 3. The operators dealing with radioisotopes must have protective suits. 4. The engineers are to study the problem of using artificial intelligence. 5. We had to change the design of this machine. 6. There are two main classes of film and hybrid integrated circuits. 7. The transistors and diodes are widely used on monolithic integrated circuits because of the relatively small size. 8. The semiconductor may have a net positive electrostatic charge. 9. The pilots had to maintain direct radio contact between the planes. 10. A modern automatic digital computer does more than 100 mln operations in each second.

1. **Трансформируйте следующие предложения в придаточные дополнительные, начав с фраз *I knew, I thought, He said* . Измените время глаголов-сказуемых в придаточных дополнительных в соответствии с правилами согласования времен. Произведите другие необходимые преобразования.**
2. My foreign friends are going to send me an invitation for visiting

Paris. 2. We can simplify this question. But there is no need for doing this. 3. A calculator is just any other electronic system, except that it uses digital electronics instead of analog electronics. 4. Everybody is going to attend the scientific conference, which is to be held in our city in May. 5. The TV program does not seem interesting and viewers cannot expect any positive changes in it. 6. He does not have to take a bus – he lives near the University. 7. The experiment has already been conducted, and scientists are pleased with the results. 8. It took him a lot of effort to complete the experiment in time. 9. Some of the most respected publications declared that a machine could never do anything that required thought. 10. How are directions to be expressed to the computer?

1. **Перепишите следующий диалог с целью передачи чужих высказываний в косвенной речи сначала в настоящем времени *(Например, Professor says that Alec’s answer was rather good and……)*, а затем в прошедшем *(Например, Professor said that Alec’s answer had been rather good and……).* Помните, что при передаче чужого высказывания в косвенной речи действует правило согласования времен, если косвенная речь вводится глаголом в прошедшем времени!**

*Professor:* Your answer was rather good. Now I would like to ask you a few extra questions.

*Alec*: Yes, Professor. I'm ready.

*Professor:* What is an interface*?*

*Alec:* An interface is interconnection between hardware, software, and people.

*Professor:* That is right. Do you agree that there are hardware interfaces and software interfaces?

*Alec:* Yes, I do. There are also interfaces between people and computers. They are terminal screens and keyboards.

*Professor:* And what are hardware interfaces?

*Alec:* They are physical channels, cables, or wires. They connect and exchange electronic signals between the CPU and peripherals or between any two units.

*Professor:* And what about software interfaces? Can you give any example?

*Alec:* Software interfaces are application programs, Data Base Management Systems, communication programs, and the operating system.

*Professor:* And what are they?

*Alec:* They are specific messages established between programs.

*Professor:* Good. I like your answer. Your mark is a five.

*Alec:* Thank you, Professor. Good-bye.

1. **Передайте диалог, пересказанный в косвенной речи, в прямой речи.**

One day David met his friend John and asked him whether John

knew something about translating machines. John replied that translating machines had been built many times but none of them, however, had done its job well enough. That was the reason why research on translating machines had gone continuously.

Then David said that one day he had seen a CD with some programs which might help to translate from Russian into English.

John advised David not to waste money and time because all these programs were unable to produce intelligible translation. They merely substituted Russian words with English equivalents and did not analyze the relations between the words of each sentence.

David exclaimed that when translating so many logical processes were involved. He added that the machine must know much about grammar, and Russian grammar was so different from English.

John also said that the commonest problem was where a word could have more than one meaning. A human translator would know which meaning to choose from the context. But machines had been known to make the wrong choice because if a machine was to make usable translations, it itself must be able to extract some, at least, of the meaning of the text. So John concluded that such machines were much further off and recommended David to study English hard.

1. **Сгруппируйте предложения в зависимости от функции герундия, а затем переведите на русский язык.**

1. Casting is а process of forming metal objects. 2. Numerous methods have been developed for producing metal castings. 3. The test needed increasing the temperature of the metal. 4. There are some ways of obtaining high quality alloys. 5. Aluminium has a melting point of 658.7° C. 6. Melting may be done in cupolas, air furnaces, electric furnaces, etc. 7. Some metals require treatment before being placed in the melting furnace. 8. We know of electric finances being used for the production of high-grade castings. 9. Plastics are a new group of materials replacing natural products. 10. Mankind is interested in atomic energy being used only for peaceful purposes.

1. **Перепишите предложения. Переведите группы выделенных слов, а затем и все предложение на русский язык.**

1. *In building* new metallurgical factories, engineers have to solve many different problems. 2. *In melting* steel, electric furnaces, crucible furnaces and converters are used. 3. Liquids and gases expand *on heating.* 4. *On completing* the construction, the machine was tested in operation. 5. Casting is a process of forming metal objects *by melting* metal and *pouring* it into molds. 6. *By introducing* new methods the engineers increased the speed of manufacture. 7. High-quality programs can't be produced *without employing* qualified programmers. 8. Magnets made *by rubbing* pieces of iron against natural magnets are called artificial magnets. 9. Scientists succeeded *in developing* means of obtaining a synthetic rubber. 10. The hardening process consists *in heating* steel and *cooling* it in water.

1. **Сравните приводимые ниже предложения с инфинитивом и покажите разницу их структурных моделей через перевод.**

1.To explain this simple fact is not very easy. To explain this fact you must know certain rules. 2. To find the mass of the electron was then of prime importance. To use electric currents properly we must be able to detect and measure them. 3. To insulate is to surround a conductor with insulating material. To explain why the temperatures of the observed bodies are quite different one should refer to the laws of hydrodynamics.

1. **Перепишите и переведите на русский язык предложения с инфинитивом в функции определения.**

1. The instruments to be used in this experiment have been provided with filters. 2. Lomonosov was the first to discover that heat, light and electricity are different forms of movement. 3. The problem mentioned above and to be considered in this paper is concerned with new principles of computer design. 4. The problem to be studied can be simplified by the use of controlled experimental conditions. 5. Industrial robots to be built now perform certain tasks even better than the man. 6. Another factor for the industrial engineer to consider is whether each manufacturing process can be automated in whole or in part.

1. **Определите, является ли *Ving* форма причастием настоящего времени или герундием. Переведите предложения на русский язык.**

1. This can be illustrated by examining the memory chip. 2. Then a final process known as metalisation completes the chip, thus reducing the processing time for a new design by two-thirds. 3. For systems requiring lower performance there is a choice: choice of technology and choice of design. 4. The designers have aimed at gaining performance by reducing the complexity of the control logic. 5. Solving these complex equations may require a digital computer. 6. The advantages of the new equipment is functioning under wide changes of temperature and pressure. 7. This represents a set of programs concerned with displaying, analyzing, checking and simulating the design. 8. Nearly all components and interconnections for data-processing equipment are fabricated by automated printing techniques, with the information for the manufacturing data being in digital form. 9. When applying these two methods, consideration should be given to the physical phenomenon. 10. The automated landing system must ensure landing the passenger airplane at night.

**14. Перепишите и переведите на русский язык следующий текст.**

There are several advantages in making computers as small al possible. Sometimes weight is particularly important. A modern aircraft, for example, carries quite a load of electronic apparatus. If it is possible to make any of these smaller, and therefore lighter, the aircraft can carry a bigger load. This kind of consideration applies to space satellites and to all kinds of computers that have to be carried about.

But weight is not the only factor. The smaller the computer the faster it can work. The signals go to and from at a very high but almost constant speed. So if one can scale down all dimensions to, let us say, one tenth, the average lengths of the current paths will be reduced to one tenths. So, very roughly speaking, scaling down of all linear dimensions in the ration of one to ten also gives a valuable advantage, the speed of operation is scaled up to 10 times. Other techniques allow even further speed increase.

The increase of operation is a real advantage. Another advantage is that less power is required to run the computer. In space satellites this is an important matter. Another advantage is reliability. Mini-computers have been made possible by the development of integrated circuits. Repair of any kind is no longer needed. If one component circuit develops a fault, all that is needed is to locate the faulty unit, throw it away and plug in a new one.