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Учебное пособие направлено на формирование общей коммуникативной и профессиональной компетенции. Состоит из практических заданий и включает базовые юридические тексты, грамматический материал, тексты для внеаудиторного чтения.

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# Оглавление

# Topic15
# Computer Security

**Topical Vocabulary**

| | |
|---|---|
| Authorized | санкционированный |
| Confidentiality | конфиденциальность |
| Integrity | целостность |
| Authentication | идентификация |
| Availability | доступность |
| Access control | контроль доступа |
| Nonrepudiation | строгое выполнение обязательств |
| Storage device | запоминающее устройство, память |
| Signify | обозначать |
| Breach | нарушение |
| Embarrass | приводить в замешательство, затруднение |
| Multisided | многосторонний |
| Vulnerable | уязвимый |

Read ant translate the text:

# The Term «Computer Security»

The term **«computer security»** is used very frequently, but the content of a computer is vulnerable to several risks unless the computer is connected to other computers to form a network. As the use of computer networks, especially the Internet, has become widely spread, the concept of computer security has expanded to signify issues relating to the networked use of computers and their resources.

The major technical areas of computer security are usually rep storage devices resented by the initials CIA: *Confidentiality*, *Integrity*, *and Authentication or*

*Availability. Confidentiality* means that information cannot be accessed by unauthorized parties. *Confidentiality* is also known as secrecy or privacy; breaches of confidentiality range from the embarrassing to the disastrous. *Integrity* means that information is protected against unauthorized changes that are not detectable to authorized users; many incidents of hacking compromise the integrity of databases and other resources. *Authentication* means that the users are those persons who they claim to be. *Availability* means that resources are accessible by authorized parties; ‘’denial of service’’ attacks, which are sometimes the topic of national news, are attacks against availability. Other important factors of computer security professionals call the *access control* and *nonrepudiation*. Maintaining *access control* means not only that users can access only those resources and services to which they are entitled, but also that they are not denied resources that they legitimately can expect to access. *Nonrepudiation* implies that a person who sends a message cannot deny that he sent it and, on the contrary, that a person who has received a message cannot deny that he received it. In addition to these technical aspects, the conceptual reach of computer security is broad and multisided. Computer security touches draws from disciplines as ethics and risk analysis, and is concerned with topics such as computer crime; the prevention, detection, and remediation of attacks; and identity and anonymity in cyberspace.

While confidentiality, integrity, and authentication are the most important concerns of a computer security manager, *privacy* is perhaps the most important aspect of computer security for everyday Internet users. Although these people may feel that they have nothing to hide when they are registering with an Internet site or service, privacy on the Internet is about protecting one’s personal information, even if the information does not seem sensitive. Nowadays it is very important that individuals are able to maintain control over what information is collected about them, how it is used, who may use it, and what purpose it is used for.

Exercise 1. **Find in the text the words and expressions meaning the following:**

- the major technical areas;
- unauthorized changes;
- the integrity of databases;
- ‘’denial of service’’;
- on the contrary;
- the conceptual reach of computer security;
- computer crime;
- the prevention and remediation of attacks;
- the most important aspect;
- everyday Internet users;
- to maintain control.

Exercise 2. **Match the following English key words with their Russian equivalents:**

| | |
|---|---|
| 1) vulnerable | a) секретность, конфиденциальность |
| 2) authentication | b) строгое выполнение обязательств |
| 3) integrity | c) уязвимый, ранимый |
| 4) nonrepudiation | d) доступность, наличие |
| 5) confidentiality | e) контроль доступа |
| 6) availability | f) установление соответствия оригиналу |
| 7) access control | g) целостность данных, неприкосновенность |

Exercise 3. **Look through the text and find English equivalents for the following expressions:**

… часто используется …

… также известна как …

… защищена от …

… может быть разделена среди …

… могут быть легко связаны в единое целое …

… с какой целью используется …

Exercise 4. **Say if it is right or wrong. Give a full answer:**

1. The major technical areas of computer security are usually rep storage devices.
2. Authentication means that the users are those persons who they claim to be.
3. Availability means that resources are accessible by authorized or unauthorized parties.
4. Other important factors of computer security professionals call the access control and nonrepudiation.
5. The conceptual reach of computer security is broad and multisided.
6. Privacy is perhaps the most important aspect of computer security for everyday Internet users.
7. Computer security doesn't touch such disciplines as ethics and risk analysis.

Exercise 5. **Complete the sentences:**

1. The term «computer security» is used very frequently, but the content … .
2. The major technical areas of computer security are usually … .
3. Maintaining access control means not only that users can … .
4. Computer security touches draws from disciplines as … .
5. … is perhaps the most important aspect of computer security for everyday Internet users.
6. Nowadays it is very important that individuals are able to maintain … .
7. The concept of computer security has expanded to signify issues relating to … .

Exercise 6**. Put the verbs in the Continuous Tenses (Present, Past, Future), then translate sentences:**

1. They (to write) documentation of a program now. 2. We (to have) computer classes from 4 till 5. 3. Yesterday during two hours we (to surf) the Web. 4. We (to listen) to a lecture about computer security when our commander came in. 5.All morning yesterday the student (to code) information using a binary code. 6. Tomorrow evening I (to write) letters and faxes to my friend. 7. I'm sorry. I'm busy now. I (to design) applications against viruses.

Exercise 7. **Make up sentences using the following words:**

1. cannot, that, by, information, parties, means, be, confidentiality, unauthorized, accessed.

2. of, networks, the, especially, computer, has, use, become, the, spread, Internet, widely.

3. important, other, of, factors, computer, professionals, the, security, access, call, and, control, nonrepudiation.

4. is, perhaps, users, the, aspect, of, computer, for, important, everyday, privacy, Internet, most, security.

Exercise 8. **Translate from Russian into English**:

1. Термин «компьютерная безопасность» используется довольно часто.

2. Основные технические сферы компьютерной безопасности можно представить аббревиатурой CIA.

3. Конфиденциальность подразумевает, что информация не может быть доступна неизвестным сторонам.

4. Целостность значит, что информация защищена от изменения неопознанными лицами.

5. Доступность значит, что ресурсами могут пользоваться любые лица.

6. В целом, термин «компьютерная безопасность» довольно широк и многосторонен.
7. Важно знать, кто, с какой целью и как использует информацию о личностях пользователей.

Exercise 9. **Complete the definitions with these words:**
*Confidentiality; integrity; authentication; availability; access control*; *nonrepudiation.*

1. … means not only that users can access only those resources and services to which they are entitled, but also that they are not denied resources that they legitimately can expect to access.
2. ... means that resources are accessible by authorized parties.
3. … means that information cannot be accessed by unauthorized parties.
4. … implies that a person who sends a message cannot deny that he sent it and, on the contrary, that a person who has received a message cannot deny that he received it.
5. … means that information is protected against unauthorized changes that are not detectable to authorized users.
6. … means that the users are those persons who they claim to be.

Exercise 10. **Answer the following questions:**
1) What is the term of computer security?
2) Which are the major technical areas of computer security?
3) What do confidentiality, integrity and authentication mean in terms of PC security?
4) What is nonrepudiation?
5) What disciplines does the term concern?
6) What is the most important aspect of computer security nowadays?
7) What is protected while surfing the Internet?

Exercise 11. **Retell the text about computer security.**

## SUPPLEMENTARY READING

Read and translate the texts. Use the dictionary

### Computer security. Background and Organization

Computer security as a discipline was first studied in the early 1970s, although the issues had influenced the development of many earlier systems such as the Atlas system and MULTICS. Unfortunately, many of the early seminal papers are often overlooked as developers (and sometimes researchers) rediscover problems and solutions, leading to wasted time and development effort.

The information in these papers provides a historical record of how computer security developed, and why. It provides a resource for computer security education. Instructors will be able to assign sets of papers for students to analyze without having to assemble the resource materials. Lastly, it provides a resource for practitioners, to which they can turn to see what has been suggested (and tried) before, under what conditions, and with what results.

During a discussion of this problem and the benefits of studying the papers, someone suggested finding these papers and making them available to the community. This project grew from that idea.

This CD-ROM, the first in a series (we hope), contains 16 seminal papers. Only papers without copyright restrictions were considered, because we wanted to put out the first CD-ROM quickly to enable the community to accrue benefits as early as possible. We also needed to determine if the process were feasible. (as proof that the idea of the project has merit).

To determine which papers should be included, we polled 25 security researchers, developers, and educators who were very familiar with the literature of the period in question. We confined our request to those papers produced under government contract and *not* published in a journal or conference proceeding. The response was overwhelming. We produced a list of 26 papers that respondents believed should be included.

We then gathered as many of the papers as we could find. Many of the polled people sent us copies of the papers. We were able to obtain, and scan in, 16 for this first release.

For the future: we have numerous papers that we did not put onto the CD-ROM for various reasons, and are still receiving suggestions! We have enough suggestions to produce at least 3 more CD-ROMs. We will attempt to do so in the near future.

## *Secure operating systems*

One use of the term computer security refers to technology to implement a secure operating system. Much of this technology is based on science developed in the 1980s and used to produce what may be some of the most impenetrable operating systems ever. Though still valid, the technology is almost inactive today, perhaps because it is complex or not widely understood. Such ultra-strong secure operating systems are based on operating system kernel technology that can guarantee that certain security policies are absolutely enforced in an operating environment. An example of such a Computer security policy is the Bell-LaPadula model. The strategy is based on a coupling of special microprocessor hardware features, often involving the memory management unit, to a special correctly implemented operating system kernel. This forms the foundation for a secure operating system which, if certain critical parts are

designed and implemented correctly, can ensure the absolute impossibility of penetration by hostile elements. This capability is enabled because the configuration not only imposes a security policy, but in theory completely protects itself from corruption. Ordinary operating systems, on the other hand, lack the features that assure this maximal level of security. The design methodology to produce such secure systems is precise, deterministic and logical.

Systems designed with such methodology represent the state of the art of computer security and the capability to produce them is not widely known. In sharp contrast to most kinds of software, they meet specifications with verifiable certainty comparable to specifications for size, weight and power. Secure operating systems designed this way are used primarily to protect national security information and military secrets. These are very powerful security tools and very few secure operating systems have been certified at the highest level (Orange Book A-1) to operate over the range of "Top Secret" to "unclassified" (including Honeywell SCOMP, USAF SACDIN, NSA Blacker and Boeing MLS LAN.) The assurance of security depends not only on the soundness of the design strategy, but also on the assurance of correctness of the implementation, and therefore there are degrees of security strength defined for COMPUSEC. The Common Criteria quantifies security strength of products in terms of two components, security capability (as Protection Profile) and assurance levels (as EAL levels.) None of these ultra-high assurance secure general purpose operating systems have been produced for decades or certified under the Common Criteria. The Orange Book Trusted Computer System Evaluation Criteria (TCSEC) is a United States Government Department of Defense (DoD) standard that sets basic requirements for assessing the effectiveness of computer security controls built into a computer system. ... The Common Criteria for Information Technology Security Evaluation (abbreviated as Common Criteria or CC) is an international standard (ISO/IEC 15408) for computer security. ... A

Protection Profile (PP) is a document used as part of the evaluation process for the Common Criteria (CC). ...

# Grammar

## Функции и перевод it

В предложении **it** может употребляться:

1) как личное местоимение в функциях подлежащего (именительный падеж) и дополнения (объектный падеж); переводится словами *он, она* или *его, ее*

Take this book. Возьми эту книгу.

It is interesting. **Она** интересная.

Read **it.** Прочти **ее.**

We shall speak about **it** next time. Мы поговорим **о ней** в следующий раз.

2) как указательное местоимение (переводится словом *это):*

What is **it?** It is our new laboratory. Что это? Это наша новая лаборатория.

3) как формальное (вводящее) подлежащее в выражениях типа

It is cold. Холодно.

It is getting dark. Темнеет.

It is winter. Зима

It is necessary to... Необходимо...

It seems... Кажется...

It is known that... Известно, что...

В этих предложениях **it** не переводится.

4) в составе усилительной конструкции **it is ...that (it** не переводится):

It **is** this book **that** I want to read. **Именно** эту книгу я хочу прочитать.

5) как формальное дополнение в выражениях типа **make it possible** *делать возможным;* **make it difficult** *затруднять;* **find it useful** *считать (находить) полезным* (здесь **it** также не переводится).

**Ex.1 Translate from Russian into English**

А. 1.Сейчас зима. 2. Я надеюсь, в сентябре будет тепло. 3. Они добрались до реки в 10 часов. Было уже совсем темно. 4. Когда мы приехали в Сочи, была весна. 5. Ночь, но на улице довольно светло. 6. Здесь очень жарко, не правда ли? 7. Сейчас поздно. Тебе следует звонить им. 8. Ему было трудно переводить эту статью, так как он не знал многих слов. 9. Ты думаешь, тебе будет легко написать эту работу? 10. Так просто выучить правила, почему вы не сделали этого? 11. Было нелегко понять его. 12. Я надеюсь, вам будет интересно послушать его. 13. Он сказал, что вам важно закончить статью. 14. Сейчас шесть часов. Я думаю, что слишком рано будить его. 15. Так странно, что ему не понравилось морское путешествие на корабле. 16. Я знаю, что ему трудно работать на заводе и учиться в институте. 17. Студентам было легко разговаривать с ним по-английски. 18. В комнате очень темно, я не вижу, что

Стоит в том дальнем углу. 19. Здесь слишком грязно, пойдемте по другой улице. 20. Нам интересно поговорить с ним. Он только что вернулся из Англии. 21. Вам будет интересно осмотреть город. Он очень изменился в последнее время. 22. Мне было трудно узнать его. Он очень постарел. 23. Он сказал вам, что очень важно обсудить этот вопрос.

Б. 1. Осенью редко идет снег. 2. Прошлым летом дожди шли каждый день. 3. Интересно, завтра будет снег. 4. Темнело, и мы спешили вернуться домой. 5. Когда я вышел на улицу, был сильный дождь. 6. Собирается дождь, не выходи на улицу. 7. Вчера пошел снег, мы поехали кататься на лыжах. 8. Ты думаешь, завтра пойдет дождь? 9. Почему ты ко мне пришел в пять? - В это время шел сильный дождь.

## Функции и перевод one

Слово **one** может быть:

1. Числительным. В этом случае **one** стоит перед существительным, является его определением и переводится словом один:

I have only **one** dictionary. У меня есть только **один** словарь.

2. Неопределенным местоимением. Тогда **one** употребляется в качестве подлежащего в неопределенно-личных предложениях и на русский язык не переводится:

**One can** read such a text without a dictionary. Можно читать такой текст без словаря.

3. Заменителем существительного. В этом случае **one** употребляется вместо ранее упомянутого существительного, чтобы избежать его повторения. Перед словозаменителем может стоять артикль и оно может употребляться в форме множественного числа (ones). Переводится **one** тем существительным, которое заменяет, или не переводится вообще, например:

You may take my dictionary (dictionaries). Вы можете взять мой словарь (словари).

Thank you, I have **one** (ones), **the one** that Peter gave me yesterday. Спасибо, у меня есть **сл (словари), тот,** который дал мне вчера Петя.

## Ex. 1.Translate into Russian

1.One must study a lot to become an engineer. 2. We must write only one exercise now. 3. Engineer is one of the most important occupations, it is the one that is taught at technical institutes. 4. One cannot translate such an article without a dictionary in the first year. 5. One must have a very good knowledge of general engineering subjects to become a good engineer. 6. One must pass all exams well to enter an institute. 7. Last summer I read many English articles, and my friend read some German ones. 8. This summer we shall spend in the

country, the last one we spent in the city. 9. We translated many texts, but there is one more text to translate. 10. One can take this journal from the library.

## Ex. 2 Translate into Russian

1. The problem that has become the most important one is the problem of pollution. 2. One can easily understand why the profession of an engineer requires a special college training 3. The new technologies that are being developed must be connected with traditional ones. 4. That air and water pollution by industrialization is reaching dangerous levels is realized by everyone. 5. It is the invention of an engine that started the first industrial revolution. 6. The main purpose of education is that graduates must be able to work with the technology of tomorrow. 7. The education in Oxford and Cambridge is different in many ways from that in other universities. 8. We discussed the first industrial revolution, the one that took place some centuries ago. 9. New robots will have several manipulators that will carry out many functions. 10. That computers and robots are important for industrial uses is well known to scientists and engineers. 11. One must realize that the increasing number of cars brings about considerable pollution of the air. 12. It is the growth of industrialization that is changing the climate of the planet. 13. The essential feature of higher education in this country is that it combines theory with practice. 14. The simplest materials are those which have only one kind of atoms. 15. That the Earth is round was unknown for a long time. 16. It is found that the labour (труд) of a man with secondary education is 108 per cent more efficient than that of a man without that education. Moreover, the work of a university or college graduate is 300 per cent more efficient than that of a specialist with secondary education.

# Topic 16

# Computer Literacy

## Topic 16

## Computer literacy

**New words to the text**

computer literacy — компьютерная грамотность

problem-solving device — устройство, обеспечивающее решение задачи

be aware of — понимать, сознавать

opportunity — возможность

basics — основы

application — применение; использование

to restate — пересмотреть, переосмыслить

significant — значительный

achievements — достижения

computing — вычисление; счет; работа на компьютере

to embrace — охватывать

dimension — измерение

instruction — команда, инструкция, указание

to direct the operation — направлять работу

to process — обрабатывать

subscription magazine — журнал по подписке

data processing system — система обработки данных

store manager — директор магазина

to have much in common — иметь много общего

**2. Read and translate the text**

## Computer literacy

Informed citizens of our information-dependent society shoud be computer-literate, which means that they should be able to use computers as everyday problem-solving devices. They should be aware of the potential of computers to influence the quality of life.

There was a time when only priviliged people had an opportunity to learn the basics, called the three R's: reading, writing, and arithmetics. Now, as we are quickly becoming an information-becoming society, it is time to restate this right as the right to learn reading, writing and *computing.* There is little doubt that computers and their many applications are among the most significant technical achievements of the century. They bring with them both economic and social changes. "Computing" is a concept that embraces not only the old third R, arithmetics, but also a new idea — computer literacy.

In an information society a person who is computer-literate need not be an expert on the design of computers. He needn't even know much about how to prepare *programs* which are the instructions that direct the operations of computers. All of us are already on the way to becoming computer-literate. Just think of your everyday life. If you receive a subscription magazine in the post-office, it is probably addressed to you by a computer. If you buy something with a bank credit card or pay a bill by check, computers help you process the information. When you check out at the counter of your store, a computer assists the checkout clerk and the store manager. When you visit your doctor, your schedules and bills and special services, such as laboratory tests, are prepared by computer. Many actions that you have taken or observed have much in common. Each relates to some aspect of a data processing system.

**3. Answer the questions using the text**

1. What does "a computer-literate person" mean? 2. Are you aware of the potential of computers to influence your life? 3. What do the people mean by "the basics"? 4. What is the role of computers in our society? 5. What is "computing'? 6. What is a program? 7. Prove that we all are on the way to becoming computer-literate. 8. Give examples of using computers in everyday life.

**4. Read and translate the word combinations**

An information-dependent society; a computer-literate citizen; an everyday problem-solving device; to be aware; to influence the quality of life; to have an opportunity; to learn the basics; to learn computing; the most significant technical achievements; to embrace computer literacy; to prepare programs; to direct the operations of a computer; to be on the way of becoming computer-literate; to process information; to have much in common; a data processing system.

**5. Use the Past Simple Tense.**

***A*. Say three forms of the following irregular verbs**:

To be; to have; to mean; to learn; to become; to bring; to know; to think; to buy; to pay; to take; to do; to begin; to give; to make;, to keep; to get; to read; to show.

***B*. Make the sentences into Past Simple.**

1. Many people have an opportunity to use computers.2. There is no doubt that computers solve problems very quickly. 3. Instructions direct the operation of a computer. 4. Computers bring with them both economic and social changes. 5. Computing embraces not only arithmetics, but also computer literacy. 6. It is well known that computers prepare laboratory tests.7. Those persons are computer literate and think of buying a newcomputer. 8. They receive a subscription magazine once a month. 9. My mother is ill

and visits her doctor every other day. 10. Experts know much about how to prepare programs.

**New words to the text**

intricate — сложный, запутанный

electronic circuit — электронная цепь, схема

to operate switches — приводить в действие переключатели

to store numbers — запоминать числа

to input / to feed in — вводить (информацию)

to turn on = to switch on — включать

to turn off = to switch off— выключать

to process data — обрабатывать данные

to supply — подавать, вводить, снабжать, обеспечивать

addition — сложение

subtraction — вычитание

division —деление

multiplication — умножение

exponentiation — возведение в степень

user — пользователь

input device — устройство ввода

disk drive — дисковое запоминающее устройство, дисковод

tape drive — запоминающее устройство на магнитной ленте

cathode-ray tube — электроннолучевая трубка

to make decisions — принимать решения

instantaneously — мгновенно, немедленно

**2. Read and translate the text**

## What is a computer?

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 or two possible states, that is, on or off; magnetized or demagnetized. The machine is capable of storing and manipulating numbers, letters, and characters (symbols).

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 magnetize or do not magnetize the cores.

The basic job of computers is 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, perform mathematical and / or logical operations on the information, and then supply results of these operations. The program, or 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.

It is considered that computers have many remarkable powers. However most computers, whether large or small, have three basic capabilities.

First, computers have circuits for performing arithmetic operations, such as: addition, subtraction, division, multiplication and exponentiation.

Second, computers have a means of communicating with the user. After all, if we couldn't feed information in and get results back, these machines wouldn't be of much use. Some of the most common methods of inputting information are to use terminals, diskettes, disks and magnetic tapes. The computer's input device (a disk drive or tape drive) reads the information into the computer. For outputting information two common devices used are: a printer, printing the

new information on paper, and a cathode-ray-tube display, which shows the results on a TV-like 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 the 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 less than another? Are two numbers equal? and, Is one number greater than another?

A computer can solve a series of problems and make thousands of logical decisions without becoming tired. It can find the solution to a problem in a fraction of the time it takes a human being to do the job.

**2. Answer the questions using the text**

1. What is a computer? 2. What are the two possible states of the switches? 3. What are the main functions of a computer? 4. In what way can we make the computer do what we want? 5. What is the basic task of a computer? 6. In what form does a computer accept information? 7. What is a program? 8. What are data? 9. What is memory? 10. What three basic capabilities have computers? 11. What are the ways of inputting information into the computer? 12. What is the function of an input device? 13. What devices are used for outputting information? 14. What decisions can the computer make? 15. What are the computer's achievements limited by?

**3. Give the English equivalents**

Сложная сеть электронных цепей; управлять (приводить в действие) переключателями; возможные состояния; хранить (запоминать) числа; обрабатывать символы; посредством ввода сигналов; включать; выключать; размагничивать сердечники; обработка информации; информация в виде команд; символы, называемые данными; выполнять математические операции; выдавать результаты; обеспечивать необходимую информацию; иметь замечательные возможности; основные

свойства; сложение, вычитание, деление, умножение; возведение в степень; средства для общения с пользователем; устройство ввода; дисковод; считывать информацию; вывод информации; катоднолучевая трубка; принимать решения; выполнять тысячи логических операций; нудная рутинная работа; в соответствии с введенной программой; вырабатывать свои суждения; возможности ограничены программой, заложенной в него человеком; дать требуемую информацию; электрические импульсы; со скоростью света; мгновенно производить огромное количество математических операций; человеку может не хватить всей жизни, чтобы закончить работу.

**4. Give the synonyms to the words**

Verbs: to turn on, to provide, to type, to accept, to help, to learn, to observe, to call, to tell, to keep, to feed, to solve, to relate, to switch off, to communicate, to receive, to supply, to switch on, to assist, to print, to study, to input, to turn off, to decide, to store, to say, to name, to watch.

Nouns: work, machine, fundamentals, display, application, capabilities, job, storage, screen, state, basics, use, concept, specialist, journal, character, memory, idea, expert, magazine, position, symbol, command, data, solution, device, instruction, powers, information, decision.

Adjectives: basic, tiny, common, small, main, significant, routine, general, remarkable, uninterested, intricate, important, wonderful, complex, little.

Adverbs: rapidly, probably, instantaneously, in a moment, quickly, perhaps.

# Grammar

## Оборот Be going to

Образуется глаголом **to go** в форме Present Continuous (**am/is/are going -** здесь имеет значение *собираюсь, намереваюсь*) и инфинитивом смыслового глагола с частицей **to**.

**1** Употребляется для выражения намерения совершить действие в будущем:

| | |
|---|---|
| I**'m going to work** in summer. | *Я **собираюсь работать** летом.* |
| I **am going to send** him a telegram. | *Я **собираюсь послать** ему телеграмму.* |
| We**'re going to get married** in June. | *Мы **собираемся пожениться** в июне.* |
| How long **are** you **going to stay** with us? | *Сколько времени ты **собираешься пробыть** у нас?* |

Во избежание тавтологии форму с **be going to** не употребляют с глаголами **to go** и **to come**. Вместо нее обычно используют форму Present Continuous этих глаголов:

| | |
|---|---|
| вместо He is going to come here. – говорят: He **is coming** here. | *Он **собирается прийти** (придет) сюда.* |
| When **are** you **going** home? | *Когда ты **собираешься** (пойдешь) домой?* |

**2** Этот оборот также используется для выражения большой вероятности или неизбежности совершения действий в будущем, так как их признаки очевидны в настоящем: (прогнозируемое будущее).

Watch out! Those boxes **are going to fall** over! *Осторожно! Те коробки сейчас **упадут**.*

| | |
|---|---|
| The sky is clearing up; the rain **is going to stop** in a minute. | *Небо проясняется; дождь **прекратится** через минуту.* |

**Различие в употребление Present Continuous и to be going to.**

Present Continuous подчеркивает наличие предварительной договоренности (назначенного времени встречи, купленного билета и т.п.), а **to be going to** привлекает внимание к наличию решения о том, что собираются делать:

| | |
|---|---|
| I **am meeting** him tomorrow.(Present Continuous) | *Я **встречаюсь** с ним завтра.* (уже есть договоренность) |
| I **am going to meet** him tomorrow. | *Я **собираюсь встретиться** с ним завтра.* (я уже принял решение, но он еще не знает об этом) |

**Различие в употребление Future Indefinite и to be going to.**

Употребляя оборот **to be going to** подчеркивают, уже имеется запланированное до момента речи намерение осуществить действие в будущем. Форма Future Indefinite представляет будущие события как просто вероятные факты; передает намерение что-либо сделать, но без твердой уверенности, как с **to be going to**; либо передает намерения, решения, возникшие в момент разговора.

| | |
|---|---|
| We have run out of sugar. | *У нас кончился сахар.* |
| I know. I**'m going to buy** some. | *Я знаю. Я **собираюсь купить** его.* |
| I**'ll buy** some when I go shopping. | *Я **куплю**, когда пойду в магазин.* |

# Practice

**1. Read and translate the sentences paying attention to «to be going to»(собираться сделать что-либо)**

1.I am going to be engaged in sports after classes. 2. My friend is going to enter the Moscow Law Institute next year. 3. My tutor and I are going to discuss my essay on Friday. 4. My friend is going to study English at the University. 5. What are you going to become in future? 6. Are you going to attend his lecture tomorrow? 7. We are going to take part in the debating society. 8. I am going to work as a detective. 9. Our students are going to work in the English laboratory after classes. 10. What are you going to do after classes? – To work at our English in the laboratory and then we are going to have club activities. 11. Where are you going to live? – As there is no hostel in our College, the majority of our students are going to live in lodgings. 12. The majority of our graduates are going to work as detectives.

**2. Translate into English**

1. На небе много облаков (**The sky is overcast**.). Скоро пойдет дождь.

2. У Анны кончился бензин (**to be /run outofsth**). Она собирается заехать на ближайшую заправочную станцию.

3. — Ты завтракал?

— Нет, но буду завтракать после девяти.

4. — Ты помыл машину?

— Нет еще. Я собираюсь помыть ее вечером.

5. — Ты думаешь (планируешь) покупать новый Оксфордский словарь?

— Да, конечно. Я хочу это сделать сегодня.

6. Я не собиралась идти в кино, но мои друзья меня уговорили (**to persuade**).

7. Он планирует опубликовать острые политические статьи в этой газете.

8. Семья Эндрюз собирается провести месяц в Испании.

9. Я думаю, у нас есть немного времени. Я хочу сдать вещи в багаж (**left-luggage office**).

10. Спасибо за приглашение, но я собираюсь проверять студенческие курсовые работы.

11. — Ты прочитал эту газету?

— Нет, я собираюсь прочитать ее после обеда.

12. — Сегодня в клубе дискотека. Ты собираешься пойти туда?

— Да.

13. Я как раз собирался ему позвонить, когда он пришел.

14. Это как раз то, что я собирался сказать.

15. Они собирались (планировали) пойти на рыбалку, но потом передумали.

16. Джейн вернулась с вечеринки поздно, она проспит на работу.

17. Утром я думаю пойти к зубному врачу, потому что у меня сильно болят зубы.

18. Он собирается поехать в Лондон на летние каникулы.

19. Англия собирается присоединиться к государствам Европейского Союза, принявшим единую валюту «евро» (**the «Euro»**).

20. США собираются расширить квоты (**quota**) на рабочие визы специалистам из разных стран.

# Topic 17
# History of the Internet Development

**Some words to the text:**

| | |
|---|---|
| To originate | возникнуть, создавать, порождать |
| To make sure | убедиться, удостовериться |
| Nuclear | ядерный |
| To discover | обнаружить, открыть |
| Random | случайный, произвольный |
| To create | создавать |
| To let | позволять, разрешать |
| To navigate | передвигаться, перемещаться (в сети) |
| To send | посылать |
| To receive | получать |
| To share | разделять, делить |
| To identify | идентифицировать, опознавать |

Read ant translate the text:

## The Internet

The Internet is an International computer Network made up of thousands of networks linked together. All these computers communicate with one another; they share data, resources, transfer information, etc. To do it they need to use the same language or protocol: TCP / IP (Transmission Control Protocol / Internet Protocol) and every computer is given an address or IP number. This number is a way to identify the computer on the Internet.

The Internet originated in the early 1970s when the United States wanted to make sure the people could communicate after the nuclear war. This needed a free and independent communication network without a centre and it led to a network of computers that could send each other e-mail through cyberspace.

In 1989, Tim Berners-Lee, a British computer scientist, invented the World Wide Web (WWW) when he discovered a way to jump to different files on his computer using the random or unplanned links between them. He then wrote a simple coding system, called HTML (Hyper Text Markup Language) to create links to files on any computer connected to the network. This was possible because each file had an individual address, or URL (Uniform Resource Locator). Then he used a set of transfer rules, called HTTP (Hyper Text Transfer Protocol) to link Web files together across the Internet. Berners-Lee also invented the world's first browser. This lets you locate and view Web pages and also navigate from one link to another.

The WWW became available to everyone in 1991 and the number of Internet users grew from 600,000 to 40 million in five years. Today, that number is much larger and nowadays there are many browsers that provide Web pages, information and other services. You can also do research, download music files, play interactive games, talk in chat rooms and send and receive e-mail on the WWW.

Exercise 1. **Translate the words without dictionary**

Network , communication, cyberspace, file, browser, transfer, interactive, e-mail, code, information, service, game, chat.

Exercise 2. **Find in the text above the words or abbreviations for the next word combinations**

- an address for Web pages
- a coding system that creates links
- this finds and shows Web pages
- rules for transferring files

- a group of computers joined together.

Exercise 3. **Circle the odd ones out.**

1. browse surf view start
2. originate move create invent
3. download navigate make transfer
4. discover locate find inform
5. connect communicate link join

Exercise 4. **Find in the text above the English equivalents for the following words and expressions:**

- международная компьютерная сеть
- ядерная война
- независимый
- обнаружил способ
- стать доступным
- через 5 лет
- обеспечить
- свод (набор) правил передачи
- загружать файлы
- играть в игры
- посылать и получать электронные письма.

Exercise 5. **Confirm or deny the statements using the following phrases:**

*Quite so…*

*Right you are…*

*I quite agree with you here …*

*Or:*

*I am afraid not…*

*I don't agree with you…*

*I am afraid you are wrong*

*Excuse me but…*

*On the contrary…*

*Not quite so…*

1. The Internet first started in the USA.
2. The Internet and the WWW are different.
3. Tim Berners-Lee invented the Internet.
4. One file on the WWW can have two or more addresses.
5. There are 40 million Internet users today.
6. Tim Berners-Lee also invented the world's first browser.
7. Nowadays you can't easily do research, download music files, play interactive games on the WWW.

Exercise 6. **Put the verbs in the Past and Future Indefinite, making necessary changes.**

1. He **plays** computer games every day. 2. She **learns** computer language. 3. We **install** and **maintain** network. 4. They often **make** mistakes. 5. I **help** my friend to write computer program. 6. They **do** their Internet shopping every day. 7. We **send** emails to our offices all over the world. 8. Tom **gets** excellent results in computer programming. 9. Many people **have** an opportunity to use computers. 10. Instructions **direct** the operation of a computer.

Exercise 7. **Make sentences interrogative and negative.**

1. The Internet provides a wide variety of opportunities for communication and development. 2. Netiquette includes more than good spelling and grammar. 3. An email virus spreads by sending a copy of itself. 4. Internet-based crimes include spam and phishing. 5. The Internet started in the USA. 6. They spent too much time playing computer games. 7. We shall use Internet to obtain necessary information about this project. 8. He will start his career as a webmaster. 9.

Experts know much about how to prepare programs. 10. They receive a subscription magazine once a month.

Exercise 8. **Answer the following questions**.

1. Do you surf the Web very often? - Yes, I .../ No, I ....
2. Does he chat with his friends? - Yes, he .../ No, he ....
3. Did you reorganize the database structure ? - Yes, you.../ No, you....
4. Did they write documentation of a program? /- Yes, they.../ No, they....
5. Will she design applications against viruses? – Yes, she…./ No, she
6. Shall we control computer data processing? –Yes, we…/ No, we ….

Exercise 9. **Put questions to the italicized words.**

1. Technical writers write the instructions for ***ITC system***. 2. ***The Internet*** enables users to exchange files and send email. 3. ***Every day*** millions of children spend time in ***Internet chat rooms***. 4. ***Crackers*** try to find a way to copy ***the latest computer program***. 5. ***Last year*** we maintained ***web pages*** and ***web applications*** for websites. 6. ***Her*** brother made ***three*** mistakes in his test. 7. ***He*** worked as a software engineer ***two years ago***. 8. ***They*** will remember ***this day*** for ever. 9. ***My*** friend will buy ***a tablet PC*** **.**

Exercise 10. **Complete the following sentences with the words and phrases from the bracket:**

*(network; cyberspace; random; create; transfer; navigate; interactive)*

1. Some people spend too much time playing … games on the Internet.
2. You can sometimes have a computer … that is not connected to the Internet.
3. It is easy to … around a screen with a mouse.
4. Tim Berners-Lee discovered how to … links between computers in new ways.
5. Some people surf the net at … just to see what they can find.
6. People use the Internet to … information from one place to another.

7. When you surf the Internet, you are traveling in ….

Exercise 11**. Write 10 questions to the text.**

# The World Wide Web

**The World Wide Web, Web** or **WWW** is a network of documents that works in a hypertext environment, i.e. using text that contains links, hyperlinks to other documents. The files, web pages, are stored in computers, which act as servers. Your computer, the client, uses a web browser, a special program to access and download them. The web pages are organized in websites, groups of pages located on the Web, maintained by a webmaster, the manager of a website. The Web enables you to post and access all sorts of interactive multimedia information and has become a real information highway.

## How to surf the Web

To surf or navigate the Web, access and retrieve web pages or websites, you need a computer with an Internet connection and a web browser. After you have launched it, you must type the website address or URL (Uniform Resource Locator), which may look like this:

*http:/www.cup.org./education/sample.htm.*

*http:/* indicates the type of protocol that the server and browser will use to communicate. Here it is Hypertext Transfer Protocol.

*www.* Shows that it is a resource on the **World Wide Web.**

*cup.org./* is the domain name of the web server that hosts the website.

*education* is the path, the place where a web page is located.

*sample.htm.* is the filename or name of a single web page.

The different parts are separated by full stops (.) and forward slashes (/). When we say a URL, we say dot(.) and slash (/).

To find interesting sites you can use search engines, where the website information is complied by spiders, computer-robot programs that collect

information from sites by using keywords, or through web indexes, subject directories that are selected by people and organized into hierarchical subject categories. Some web portals – websites that offer all types of services, e.g. email, forums, search engines, etc. – are also good starting points.

The most relevant website addresses can be stored in your computer using the bookmarks or favourited function in your browser.

Websites usually have a beginning page or home page. From this starting point you can navigate by clicking your mouse on hyperlinks in texts or images.

Exercise 2**. Complete these instructions about how to navigate with the words in the bracket**

*(client; search engine; web page; web server; surf; website; web browser; URL)*

1. Start up your computer and connect to the Internet.
2. Open your _____ _____.
3. Type the _____ to access a website.
4. Your web browser sends the request to the correct _____ _____.
5. The server looks for the document and sends it to the _____ computer.
6. Your web browser displays the selected _____ _____ on the screen.
7. From the home page of the _____ you can _____ to other pages by clicking on hyperlinks.
8. If you want to find more websites, use a _____ _____.

Exercise 3. **Complete the text with these prepositions. Some of them can be used more than once. Then translate the text, then discuss it.**

*(as, at, from, in, of, on, to)*

## The Facebook phenomenon

Many people want to be rich and successful, but not many of them manage to achieve it, let alone before their thirtieth birthday! However, Mark Zuckerberg is one of these people.

Mark Zuckerberg is one of the founders of Facebook, the most popular social networking site (1) __ the planet. With close to 500 million users, the site he started while studying (2) __ Harvard University has made him the 35th richest man (3) __ the world today.

The idea for Facebook was quite simple. Many colleges and schools in the USA traditionally publish a book every year which includes pictures of the students, teachers and other staff. This book is known (4) __ the 'Facebook'. Zuckerberg and his classmates computerized this and the system eventually spread (5) __ other universities and schools.

Six months after starting Facebook, Zuckerberg and his friends left university and moved to California as they were determined to make a success (6) ___ the site. Their idea became more and more popular until it became the huge phenomenon we know today.

So, if you dream (7) ___ being rich and famous, one thing you can learn (8) ___ Mark Zuckerberg and his creation, Facebook, is that you're never too young to start!

**Read , translate the texts A and B, then discuss them:**

## A. Welcome to Weblish!

… New technology always brings changes and new additions to the language, but the telecommunications revolution of the last few years has caused some of the most rapid and widespread changes yet seen.

….New words, such as webcast, are entering the language all the time to put a name to concepts that haven`t existed before, and existing words are being used in a new way. For example, the words access and text, previously used only as are now commonly used as verbs in phrases such as to access the Internet and to

text someone. Other words, such as chat, which used to mean `casual verbal communications` but now means `live email communications`, have taken on entire new meanings.

…. In addition, many of these English words – the most obvious being computer itself – have spread outside of the English-speaking world and become part of a global language of the technology. Thanks to the influence of the American computer industry, users of British English have abandoned some British spellings in favour of their American equivalents, such as program instead of programme and disk instead of disc.

….Finally, the style and tone of the language itself is changing. Although they are written forms of communication, the immediacy of emails and text messages means that their language is usually much more informal than a letter would be, even in a business context. And, to the concern of many people, spelling and punctuation are becoming much more unconventional.

*New words.*

Blog (web+log) a personal on-line diary or journal that anyone can access.

Cyberspace the imaginary `space` thought which Internet messages travel.

Dotcom an Internet business.

Spam unwanted emails sent to you by commercial companies.

Webcam (web+camera) a videocamera that can transmit images live over the Internet.

Webcast (web+broadcast) a live `television programme` on the Internet, broadcast by a webcam.

**B. The networked home**

Talking fridges and intelligent central heating systems could become standard in houses all over the UK within a few years. The UK government announced that it is spending a budget of £40 million on new technologies over the next few years. The Fridges and central heating systems will be able to speak to a service centre when they need a new part or when there is a problem. Some of

the new types of fridges will also be programmed to inform the owner when they are running out of certain food items. These fridges will speak to the owner when the opens the door and will tell them what they need to buy.

Television on wristwatches, the Internet on microwave ovens and DVD players on fridges will all be potential future products. Scientists might also develop energy-saving systems to reduce bills and the cost to the environment. Research is already taking place to find out what those costs will be.

The home isn`t the only focus for new developments: researchers are going to develop cars that talk to service stations and personal digital shopping assistants. They are going to program the shopping assistants not only to do the shopping but also to deliver it to people's homes.

So going shopping and buying spare parts for your fridge may become a thing of the past.

## SUPPLEMENTARY READING

Read and translate the texts. Use the dictionary.

**Internet History**

**1969 - Birth of a Network**

The Internet as we know it today, in the mid-1990s, traces it origins back to a Defense Department project in 1969. The subject of the project was wartime digital communications. At that time the telephone system was about the only theater-scale communications system in use. A major problem had been identified in its design - its dependence on switching stations that could be targeted during an attack. Would it be possible to design a network that could quickly reroute digital traffic around failed nodes? A possible solution had been identified in theory. That was to build a "web" of datagram network, called an "catenet", and use dynamic routing protocols to constantly adjust the flow of

traffic through the catenet. The Defense Advanced Research Projects Agency (DARPA) launched the DARPA Internet Program.

**1970s – Infancy**

DARPA Internet, largely the plaything of academic and military researchers, spent more than a decade in relative obscurity. As Vietnam, Watergate, the Oil Crisis, and the Iranian Hostage Crisis rolled over the nation, several Internet research teams proceeded through a gradual evolution of protocols. In 1975, DARPA declared the project a success and handed its management over to the Defense Communications Agency. Several of today's key protocols (including IP and TCP) were stable by 1980, and adopted throughout ARPANET by 1983.

**Mid 1980s - The Research Net**

Let's outline key features, circa-1983, of what was then called ARPANET. A small computer was a PDP-11/45, and a PDP-11/45 does not fit on your desk. Some sites had a hundred computers attached to the Internet. Most had a dozen or so, probably with something like a VAX doing most of the work - mail, news, EGP routing. Users did their work using DEC VT-100 terminals. FORTRAN was the word of the day. Few companies had Internet access, relying instead on SNA and IBM mainframes. Rather, the Internet community was dominated by universities and military research sites. It's most popular service was the rapid email it made possible with distant colleagues. In August 1983, there were 562 registered ARPANET hosts (RFC 1296).

UNIX deserves at least an honorable mention, since almost all the initial Internet protocols were developed first for UNIX, largely due to the availability of kernel source (for a price) and the relative ease of implementation (relative to things like VMS or MVS). The University of California at Berkeley (UCB) deserves special mention, because their Computer Science Research Group

(CSRG) developed the BSD variants of AT&T's UNIX operating system. BSD UNIX and its derivatives would become the most common Internet programming platform.

Many key features of the Internet were already in place, including the IP and TCP protocols. ARPANET was fundamentally unreliable in nature, as the Internet is still today. This principle of unreliable delivery means that the Internet only makes a best-effort attempt to deliver packets. The network can drop a packet without any notification to sender or receiver. Remember, the Internet was designed for military survivability. The software running on either end must be prepared to recognize data loss, retransmitting data as often as necessary to achieve its ultimate delivery.

**Late 1980s - The PC Revolution**

Driven largely by the development of the PC and LAN technology, subnetting was standardized in 1985 when RFC 950 was released. LAN technology made the idea of a "catenet" feasible - an internetwork of networks. Subnetting opened the possibilities of interconnecting LANs with WANs.

The National Science Foundation (NSF) started the Supercomputer Centers program in 1986. Until then, supercomputers such as Crays were largely the playthings of large, well-funded universities and military research centers. NSF's idea was to make supercomputer resources available to those of more modest means by constructing five supercomputer centers around the country and building a network linking them with potential users. NSF decided to base their network on the Internet protocols, and NSFNET was born. For the next decade, NSFNET would be the core of the U.S. Internet, until its privatization and ultimate retirement in 1995.

Domain naming was stable by 1987 when RFC 1034 was released. Until then, hostnames were mapped to IP address using static tables, but the Internet's exponential growth had made this practice infeasible.

In the late 1980s, important advances related poor network performance with poor TCP performance, and a string of papers by the likes of Nagle and Van Jacobson (RFC 896, RFC 1072, RFC 1144, RFC 1323) present key insights into TCP performance.

The 1987 Internet Worm was the largest security failure in the history of the Internet. More information can be found in RFC 1135. All things considered, it could happen again.

**Early 1990s - Address Exhaustion and the Web**

In the early 90s, the first *address exhaustion crisis* hit the Internet technical community. The present solution, CIDR, will sustain the Internet for a few more years by making more efficient use of IP's existing 32-bit address space. For a more lasting solution, IETF is looking at IPv6 and its 128-bit address space, but CIDR is here to stay.

Crisis aside, the World Wide Web (WWW) has been one of Internet's most exciting recent developments. The idea of hypertext has been around for more than a decade, but in 1989 a team at the European Center for Particle Research (CERN) in Switzerland developed a set of protocols for transferring hypertext via the Internet. In the early 1990s it was enhanced by a team at the National Center for Supercomputing Applications (NCSA) at the University of Illinois - one of NSF's supercomputer centers. The result was NCSA Mosaic, a graphical, point-and-click hypertext browser that made Internet easy. The resulting explosion in "Web sites" drove the Internet into the public eye.

**Mid 1990s - The New Internet**

Of at least as much interest as Internet's technical progress in the 1990s has been its sociological progress. It has already become part of the national vocabulary, and seems headed for even greater prominence. It has been accepted by the business community, with a resulting explosion of service providers, consultants, books, and TV coverage. It has given birth to the Free Software Movement.

The Free Software Movement owes much to bulletin board systems, but really came into its own on the Internet, due to a combination of forces. The public nature of the Internet's early funding ensured that much of its networking software was non-proprietary. The emergence of anonymous FTP sites provided a distribution mechanism that almost anyone could use. Network newsgroups and mailing lists offered an open communication medium. Last but not least were individualists like Richard Stallman, who wrote EMACS, launched the GNU Project and founded the Free Software Foundation. In the 1990s, Linus Torvalds wrote Linux, the popular (and free) UNIX clone operating system.

The explosion of capitalist conservatism, combined with a growing awareness of Internet's business value, has led to major changes in the Internet community. Many of them have not been for the good.

First, there seems to be a growing departure from Internet's history of open protocols, published as RFCs. Many new protocols are being developed in an increasingly proprietary manner. IGRP, a trademark of Cisco Systems, has the dubious distinction as the most successful proprietary Internet routing protocol, capable only of operation between Cisco routers. Other protocols, such as BGP, are published as RFCs, but with important operational details omitted. The notoriously mis-named Open Software Foundation has introduced a whole suite of "open" protocols whose specifications are available - for a price - and not on

the net. I am forced to wonder: 1) why do we need a new RPC? and 2) why won't OSF tell us how it works?

People forget that businesses have tried to run digital communications networks in the past. IBM and DEC both developed proprietary networking schemes that only ran on their hardware. Several information providers did very well for themselves in the 80s, including LEXIS/NEXIS, Dialog, and Dow Jones. Public data networks were constructed by companies like Tymnet and run into every major US city. CompuServe and others built large bulletin board-like systems. Many of these services still offer a quality and depth of coverage unparalleled on the Internet (examine Dialog if you are skeptical of this claim). But none of them offered nudie GIFs that anyone could download. None of them let you read through the RFCs and then write a Perl script to tweak the one little thing you needed to adjust. None of them gave birth to a Free Software Movement. None of them caught people's imagination.

The very existence of the Free Software Movement is part of the Internet saga, because free software would not exist without the net. "Movements" tend to arise when progress offers us new freedoms and we find new ways to explore and, sometimes, to exploit them. The Free Software Movement has offered what would be unimaginable when the Internet was formed - games, editors, windowing systems, compilers, networking software, and even entire operating systems available for anyone who wants them, without licensing fees, with complete source code, and all you need is Internet access. It also offers challenges, forcing us to ask what changes are needed in our society to support these new freedoms that have touched so many people. And it offers chances at exploitation, from the businesses using free software development platforms for commercial code, to the Internet Worm and the security risks of open systems.

People wonder whether progress is better served through government funding or private industry. The Internet defies the popular wisdom of "business is better". Both business and government tried to build large data communication networks in the 1980s. Business depended on good market decisions; the government researchers based their system on openness, imagination and freedom. Business failed; Internet succeeded. Our reward has been its commercialization.

For the next few years, the Internet will almost certainly be content-driven. Although new protocols are always under development, we have barely begun to explore the potential of just the existing ones. Chief among these is the World Wide Web, with its potential for simple on-line access to almost any information imaginable. Yet even as the Internet intrudes into society, remember that over the last two decades "The Net" has developed a culture of its own, one that may collide with society's. Already business is making its pitch to dominate the Internet. Already Congress has deemed it necessary to regulate the Web. The big questions loom unanswered: How will society change the Internet... and how will the Internet change society?

# Topic 18

## Development of electronics

### Text 1

**Some new word to the text:**

| | |
|---|---|
| Applied physics | прикладная физика |
| Generation | создание, формирование, выработка |
| Scientific research | научные исследования |
| Due to the efforts | благодаря усилиям |
| Manipulation | управление, обработка, преобразование |
| To replace vacuum tubes | заменять электронные лампы |

| | |
|---|---|
| A piece of semiconductor | полупроводниковый кристалл |
| Reduced weight | уменьшенный вес |
| Power consumption | потребление (расход) электроэнергии |
| To carry out | выполнять |
| Solid body | твердое тело, кристалл, полупроводник |
| To respond | отвечать, реагировать |
| At a rate | со скоростью |
| Integrated circuit (IC) | интегральная схема |
| Batch processing | пакетная обработка |
| To assemble | собирать, монтировать |
| To lower manufacturing | снизить производительность |
| To increase reliability | увеличить надежность |

Read and translate the text:

# Development of Electronics

Electronics is a field of engineering and applied physics dealing with the design and application of electronic circuits. The operation of circuits depends on the flow of electrons for generation, transmission, reception and storage of information.

Today it is difficult to imagine our life without electronics. It surrounds us everywhere. Electronic devices are widely used in scientific research and industrial designing, they control the work of plants and power stations, calculate the trajectories of space-ships and help the people discover new phenomena of nature. Automatization of production processes and studies on living organisms become possible due to electronics.

The invention of vacuum tubes at the beginning of the $20^{th}$ century was the starting point of the rapid growth of modern electronics. Vacuum tubes assisted in manipulation of signals. The development of a large variety of tubes designed for specialized functions made possible the progress in radio communication

technology before the World War II and in the creation of early computers during and shortly after the war.

The transistor invented by American scientists W. Shockly, J. Bardeen and W. Brattain in 1948 completely replaced the vacuum tube. The transistor, a small piece of a semiconductor with three electrodes, had great advantages over the best vacuum tubes. It provided the same functions as the vacuum tube but at reduced weight, cost, power consumption, and with high reliability. With the invention of the transistor all essential circuit functions could be carried out inside bodies. The aim of creating electronic circuits with entirely solid-state components had finally been realized. Early transistors could respond at a rate of a few million times a second. This was fast enough to serve in radio circuits, but far below the speed needed for high-speed computers or for microwave communication systems.

The progress in semiconductor technology led to the development of the integrated circuit (IC), which was discovered due to the efforts of John Kilby in 1958. There appeared a new field of science – integrated electronics. The essence of it is batch processing. Instead of making, testing and assembling descrete components on a chip one at a time, large grouping of these components together with their interconnections were made all at a time. ICs greatly reduced the size of devices, lowered manufacturing costs and at the same time they provided high speed and increased reliability.

Exercise 1. **Read and translate the following international words and word-combinations without dictionary**.

Electronics; electrons; physics; information; microelectronics; industrial design; organism; specialized functions; progress in radio communication technology; transistor; electrode; components; communication system; chip.

Exercise 2. **Find in the text above the English equivalents for the following words and expressions:**

- прикладная физика
- передача и прием информации
- научные исследования
- траектория космических кораблей
- способствовать управлению сигналами
- полупроводниковый кристалл
- потребление электроэнергии
- высокоскоростной компьютер
- полупроводниковая технология
- интегральная схема
- пакетная обработка
- снизить производственные затраты
- обеспечить высокую скорость.

Exercise 3. **Make up different word-combinations using the following words (A, B) and translate them:**

| **A** | **B** |
|---|---|
| Transistor | field |
| Circuit | development |
| Size | means |
| Science | functions |
| Electronics | solution |
| Communication | invention |
| Problem | exploration |
| Space | reduction |

Exercise 4. **Say if it is right or wrong. Give a full answer.**

1. Electronics is a field of engineering and applied physics dealing with the design and application of electronic circuits.
2. Today it is easy to imagine our life without electronics.
3. Vacuum tubes didn’t assist in manipulation of signals.
4. Electronics doesn’t surrounds us everywhere.
5. With the invention of the transistor all essential circuit functions could be carried out inside bodies.
6. Early transistors could not respond at a rate of a few million times a second.
7. The progress in semiconductor technology led to the development of the integrated circuit (IC).

Exercise 5. **Complete the following sentences with the words and phrases from the bracket:**

*(innovation, invention, stage, process, portable, touch-screen)*

1. The development of a new product is a long ….
2. The first … of development is the longest.
3. We have got a … CD player which we take outside when the weather is nice.
4. If you are not familiar with using computers, I recommend a … one.
5. The … of TV has changed our life dramatically.
6. We are living in a century of technological ….

Exercise 6. **Read and translate sentences paying attention to Passive Voice.**

1. The evolution of electronic technology is sometimes called a revolution.
2. The concept of integrating device was developed by Jack Kilby.
3. The results were affected by many factors.
4. The experiment was followed by a number of mere demonstrations.
5. The Internet is used by about two billion people all over the world.
6. New types of integrated circuits have been developed lately.

Exercise 7. **Complete the sentences with the correct passive form of the verbs in brackets.**

1. Electronic devices _____ (use) in scientific research.
2. The electronic equipment _____ (damage) after a fire broke out last night.
3. New types of integrated circuits _____ (develop) lately.
4. Before the invention of the transistor its function ____ (perform) by vacuum tubes.
5. Special telescopes _____ (build) to search the sky for asteroids in a few years.
6. The reliability of electronic systems _____ (connect) with the number of descrete components.

Exercise 8. **Change the sentences from active into passive:**

**Model:** *People widely **use** electronic devices.*

*Electronic devices **are widely used** by people.*

1. Electronic devices control the work of power stations.
2. They calculated the trajectories of spaceships.
3. People discover new phenomena of nature due to electronic devices.
4. Scientists designed a variety of tubes for specialized functions.
5. American scientists invented the transistor in 1948.
6. New types of integrated circuits increased packing density.
7. Electronics has extended man's intellectual power.

Exercise 9. **Complete this funny text using these words.**

***Brochure, improvements, innovation, manufacture, process, stage***

An inventor's guide

So, you think you've finally come up with the invention that will change the world! Do you think that all those hours spent making (1) ___ to your original design and testing, re-testing and testing yet again are about to pay off? Well, before you start counting all that money you think you're going to receive for your fabulous (2) ___ you'd better think again. You see, it's a sad, but true, fact that the (3) ___ of getting something new on the market is a long one. Inventors

must travel a rough and rocky road to get from the early development (4) ___ to the all-important commercial license of their invention. So, before you're left with a cellar full of worthless gadgets that you simply cannot get rid of, consider the following carefully.

- Make a list of possible companies which might want to (5) ___ your product.
- Send a letter, or even better, a(n) (6) ___ describing your product to the companies on your list.

Finally, be patient, stay calm and never stop inventing. Even Alexander Graham Bell had his bad days!

Exercise 10. **Answer the questions to the text 1:**

1. What is electronics?
2. Can you imagine modern life without electronics?
3. Where are electronic devices used?
4. What was beginning of electronics development?
5. What made the progress in radio communication technology possible?
6. What is the transistor?
7. When was the transistor invented?
8. What aim was realized with the invention of the transistor?
9. When were integrated circuits discovered?
10. What advantages did the transistor have over the vacuum tubes

Read and translate the text, use dictionary if necessary.

# Microelectronics

The evolution of electronic technology is sometimes called a revolution: a quantitative change in technology gave rise to qualitative change in human capabilities. There appeared a new branch of science – microelectronics.

Microelectronics embraces electronics connected with the realization of electronic circuits, systems and subsystems from very small electronic devices. Microelectronics is a name for extremely small electronic components and circuit assemblies, made by film or semiconductor techniques. A microelectronic technology reduced transistors and other circuit elements to dimensions almost invisible to unaided eye. The point of this extraordinary miniaturization is to make circuits long-lasting, low in cost, and capable of performing electronic functions at extremely high speed. It is known that the speed of response depends on the size of transistor: the smaller the transistor, the faster it is. The smaller the computer, the faster it can work.

Another benefit resulting from microelectronics is the reduction of distances between circuit components. Packing density increased with the appearance of small-scale integrated circuit, medium-scale IC, large –scale IC and very large-scale IC. The change in scale was measured by the number of transistors on a chip. There appeared a new type of integrated circuit, microwave integrated circuit. The evolution of microwave IC began with the development of planar transmission lines. Then new IC components in a fineline transmission appeared. Other more exotic techniques, such as dielectric waveguide integrated circuits emerged.

Electronics has extended man's intellectual power. Microelectronics extends that power still further.

Exercise 1**. Using information of the texts 1 and 2, make a test**

1. Transistor have many ____ over vacuum tubes.

*a) patterns; b) advantages; c) scales.*

2. They _____ very little power.

*a) consume; b) generate; c) embrace*.

3. An integrated circuit is a group of elements connected together by some circuit ____ technique.

*a) processing; b) assembly; c) manipulation.*

4. The transistor consists of a small piece of a ___ with three electrodes.

*a) diode; b) conductor; c) semiconductor*.

5. Modern ____ began in the early 20th century with the invention of electronic tubes.

*a) miniaturization; b) electronics; c) microelectronics*.

6. John Fleming was the ____ of the first two-electrode vacuum tube.

*a) generator; b) receiver; c) inventor.*

7. Once of the transistor advantages was lower power ____ in comparison with vacuum tubes.

*a) consumption; b) reception; c) transmission*.

8. Microelectronics greatly extended man's intellectual _____.

*a) subsystems; b) capabilities; c) dimension.*

## SUPPLEMENTARY READING

Read and translate the texts, use dictionary if necessary

### Future trends

Read and translate the text, use dictionary if necessary.

**Nanotechnology,** the science of creating and using materials or devices at molecular and atomic sizes, is going to represent a new technological revolution. These devices will fall in the range of 1 nanometre, which is equal to one billionth of a metre, to 100 nanometres (nm).

**Nanobots,** robots formed from molecular or molecular components, will be used in medicine to control and diagnose diseases. For example, they will be injecting and will move through blood vessels destroying cholesterol molecular or cancer.

**Nanocomputers,** molecule-sized computers, may have the power of 100 workstations but only be size of a grain of sand. There will be two main types of molecular computers:

•**Quantum computers,** based on quantum mechanics, may be millions of time faster than current computer. They will be so fast because they will be able to examine all possible answers to a query at the same time. This capability is made possible by qbits, **quantum bits**, which can be 0 or 1, or something in between, simultaneously.

•**DNA computers** will use **DNA biochips** to perform the same functions as silicon microchips do today but at a much faster speed.

Exercise 1. **Read these extracts and replace the world in *italics* with words in the text above.**

1. ***A computer of this type*** is a molecular computer that works biochemically. It 'computer' using enzymes that cause chain reactions.

2. In ***a computer of this type***, data is processed by exploiting the strange qualities of quantum physics; the building blocks of computation are not transistor but caged atoms or qbits.

3. ***It*** has the potential to revolutionize the way live, from creating miniaturized 'Star Trek'- like electronic gadgets to delivering medicines to specific placed within the human body.

4. The government plans to fund a study examining the feasibility of ***molecule-sized robotic devices*** that would positions atoms to build complex substances and products.

5. Scientists at an Israeli institute have developed a ***very small one –*** so small that a trillion of its kind fit into a test tube.

## Walter Houser Brattain

**Walter Houser Brattain** (February 10, 1902 – October 13, 1987) was an American physicist at Bell Labs who, along with John Bardeen and William Shockley, invented the transistor. They shared the 1956 Nobel Prize in Physics for their invention. He devoted much of his life to research on surface states.

He was born to American parents Ross R. Brattain and Ottilie Houser in Amoy, China, where his father was a teacher, on February 10, 1902. He spent the early part of his life in Springfield Oregon where an elementary school is named in his honor, and Tonasket, Washington in the United States. He was raised in Tonasket, Washington on a cattle ranch owned by his parents, and earned his B.A. degree in physics and mathematics at Whitman College in Walla Walla, Washington. Brattain earned that degree in 1924 and an M.A. degree from the University of Oregon in 1926. He then moved eastward, taking his Ph.D. degree in physics at the University of Minnesota in 1929. Brattain's advisor was John T. Tate Sr., and his thesis was on electron impact in mercury vapor. In 1928 and 1929 he worked at the National Bureau of Standards in Washington, D.C., and in 1929 was hired by Bell Telephone Laboratories.

Brattain's concerns at Bell Laboratories in the years before World War II were first in the surface physics of tungsten and later in the surfaces of the semiconductors cuprous oxide and silicon. During World War II Brattain devoted his time to developing methods of submarine detection under a contract with the National Defense Research Council at Columbia University.

## William Bradford Shockley

**William Bradford Shockley Jr.** (February 13, 1910 – August 12, 1989) was an American physicist and inventor. Along with John Bardeen and Walter Houser Brattain, Shockley co-invented the transistor, for which all three were awarded the 1956 Nobel Prize in Physics.

Shockley's attempts to commercialize a new transistor design in the 1950s and 1960s led to California's "Silicon Valley" becoming a hotbed of electronics innovation. In his later life, Shockley was a professor at Stanford and became a staunch advocate of eugenics.

## John Bardeen

**John Bardeen** (May 23, 1908 – January 30, 1991) was an American physicist and electrical engineer, the only person to have won the Nobel Prize in Physics twice: first in 1956 with William Shockley and Walter Brattain for the invention of the transistor; and again in 1972 with Leon N Cooper and John Robert Schrieffer for a fundamental theory of conventional superconductivity known as the BCS theory.

The transistor revolutionized the electronics industry, allowing the Information Age to occur, and made possible the development of almost every modern electronic device, from telephones to computers to missiles. Bardeen's developments in superconductivity, which won him his second Nobel, are used in magnetic resonance imaging (MRI).

In 1990, John Bardeen appeared on *LIFE Magazine*'s list of "100 Most Influential Americans of the Century."

## The invention of the transistor

In the spring of 1947, William Shockley asked Brattain and Bardeen to explain why an amplifier he had devised didn't work. At the heart of the amplifier was a crystal of silicon. They would switch to germanium after some months. To figure out what was going on, Bardeen had to remember some of the quantum mechanics research that he had done on semiconductors while he was completing his Ph.D. at Princeton University. Bardeen had also come up with some new theories himself. By observing Brattain's experiments, Bardeen realized that everyone had been falsely assuming electrical current traveled through all parts of the germanium in a similar way. The electrons behaved differently at the surface of the non-metal. If they could control what was happening at the surface, the amplifier should work.

On December 23, 1947, Bardeen and Brattain—working without Shockley—succeeded in creating a point-contact transistor that achieved amplification. By the next month, Bell Labs' patent attorneys started to work on the patent applications.

Bell Labs' attorneys soon discovered that Shockley's field effect principle had been anticipated and patented in 1930 by Julius Lilienfeld, who filed his MESFET-like patent in Canada on October 22, 1925. Although the patent appeared "breakable" (it could not work), the patent attorneys based one of its four patent applications only on the Bardeen-Brattain point contact design. Three others submitted at the same time covered the electrolyte-based transistors with Bardeen, Gibney and Brattain as the inventors. Shockley's name was not on any of these patent applications. This angered Shockley, who thought his name should also be on the patents because the work was based on his field effect idea. He even made efforts to have the patent written only in his name, and told Bardeen and Brattain of his intentions.

At the same time, Shockley secretly continued his own work to build a different sort of transistor based on junctions instead of point contacts; he expected this kind of design would be more likely to be viable commercially. Shockley worked furiously on his magnum opus, *Electrons and Holes in Semiconductors*, which was finally published as a 558-page treatise in 1950. In it, Shockley worked out the critical ideas of drift and diffusion and the differential equations that govern the flow of electrons in solid state crystals. Shockley's diode equation is also described. This seminal work became the "bible" for an entire generation of scientists working to develop and improve new variants of the transistor and other devices based on semiconductors.

Shockley was dissatisfied with certain parts of the explanation for how the point contact transistor worked and conceived of the possibility of minority

carrier injection. This led Shockley to ideas for what he called a "sandwich transistor." This resulted in the junction transistor, which was announced at a press conference on July 4, 1951. Shockley obtained a patent for this invention on September 25, 1951. Different fabrication methods for this device were developed but the "diffused-base" method became the method of choice for many applications. It soon eclipsed the point contact transistor, and it and its offspring became overwhelmingly dominant in the marketplace for many years. Shockley continued as a group head to lead much of the effort at Bell Labs to improve it and its fabrication for two more years.

Shockley took the lion's share of the credit in public for the invention of transistor, which led to a deterioration of Bardeen's relationship with Shockley. Bell Labs management, however, consistently presented all three inventors as a team. Shockley eventually infuriated and alienated Bardeen and Brattain, and he essentially blocked the two from working on the junction transistor. Bardeen began pursuing a theory for superconductivity and left Bell Labs in 1951. Brattain refused to work with Shockley further and was assigned to another group. Neither Bardeen nor Brattain had much to do with the development of the transistor beyond the first year after its invention. The "transistor" (a combination of "transfer" and "resistor") was 1/50 as large as the vacuum tubes it replaced in televisions and radios and allowed electrical devices to become more compact.

# Topic 19

# Data processing concepts

**New words to the text**

data processing — обработка информации (данных)

to convert — преобразовывать; переводить (в др. единицы)

to accomplish—завершать, заканчивать; осуществлять, выполнять.

to house— помещать, размещать

to improve— улучшать, совершенствовать

to control— управлять, регулировать; управление, регулирование

to store— хранить, запоминать, заносить (размещать) в памяти

storage — запоминающее устройство, память; хранение

resource— ресурс; средство; возможность

facility—- устройство; средство facilities — приспособления; возможности

equipment— оборудование; аппаратура; приборы; устройства

available— доступный; имеющийся (в наличии); возможный

display— дисплей; устройство (визуального) отображения; показ

manner— способ, образ (действий)

sequence— последовательность, порядок (следования)

sucessively— последовательно

data storage hierarchy— иерархия (последовательность) запоминания информации (данных

comprehensive groupings — полные, обширные, универсальные образования

meaningful — имеющий смысл; значащий (о данных)

item— элемент; составная часть

record — запись, регистрация; записывать, регистрировать

file— файл; заносить (хранить) в файл

set — набор; множество; совокупность; серия; группа; система

data base— база данных

related — смежный; взаимосвязанный; относящийся (к ч.-л.)

**2. Read and translate the text**

## DATA PROCESSING AND DATA PROCESSING SYSTEMS

The necessary data are processed by a computer to become useful information. In fact this is the definition of data processing. *Data* are a collection of facts — unorganized but able to be-organized into useful information. ***Processing*** is **a** series of actions or operations that convert inputs into outputs. When we speak of data processing, the input is data, and the output is useful information. So, we can define ***data processing*** as a series of actions or operations that converts data into useful information.

We use the term ***data*** *processing system* to include the resources that are used to accomplish the processing of data. There are four types of resources: people, materials, facilities, and equipment. People provide input to computers, operate them, and use their output. Materials, such as boxes of paper and printer ribbons, are consumed in great quantity. Facilities are required to house the computer equipment, people and materials.

The need for converting facts into useful information is not a phenomenon of modern life. Throughout history, and even prehistory, people have found it necessary to sort data into forms that were easier to understand. For example, the ancient Egyptians recorded the ebb and flow of the Nile River and used this information to predict yearly crop yields. Today computers convert data about land and water into recommendations to farmers on crop planting. Mechanical aids to computation were developed and improved upon in Europe, Asia, and America throughout the seventeenth, eighteenth, and nineteenth centuries. Modern computers are marvels of an electronics technology that continues to produce smaller, cheaper, and more powerful components.

**Basic data processing operations**

Five basic operations are characteristic of all data processing systems: inputting, storing, processing, outputting, and controlling. They are defined as follows.

*Inputting* is the process of entering data, which are collected facts, into a data processing system. *Storing* is saving data or information so that they are available for initial or for additional processing. *Processing* represents performing arithmetic or logical operations on data in order to convert them into useful information. *Outputting* is the process of producing useful information, such as a printed report or visual display.

Controlling is directing the manner and sequence in which all of the above operations are performed.

**Data storage hierarchy**

It is known that data, once entered, are organized and stored in successively more comprehensive groupings. Generally, these groupings are called a data storage hierarchy. The general groupings of any data storage hierarchy are as follows.

1) *Characters*, which are all written language symbols: letters, numbers, and special symbols. 2) *Data elements*, which are meaningful collections of related characters. Data elements are also called data items or fields. 3) *Records*, which are collections of related data elements. 4) *Files*, which are collections of related records. A set of related files is called a data base or a data bank.

**3. Read the text again and answer the questions**

1. What is processing? 2. What is data processing? 3. What does the term of data processing system mean? 4. What basic operations does a data processing system include? 5. What is inputting / storing / outputting information? 6. What do you understand by resources? 7. How did ancient Egyptians convert facts into useful information? 8. When were mechanical aids for computation

developed? 9. What does data storage hierarchy mean? 10. What are the general groupings of any data storage hierarchy?

**4. Give the English equivalents**

Системы обработки информации; определение (термина) обработки данных; совокупность фактов; последовательность действий; преобразование входных данных в полезную информацию; включать ресурсы; завершить обработку данных; обеспечивать ввод информации в компьютер; ленты принтера; расходовать в большом количестве; размещать компьютерное оборудование; нуждаться (требовать) в приспособлениях; явление современной жизни; на протяжении доисторического периода; превращать информацию в выражения; регистрировать отливы и приливы; прогнозировать урожай зерновых культур; механические средства вычисления; ввод данных; хранение данных; первоначальная обработка данных; дополнительная обработка; выдача полезной информации; напечатанное сообщение; зрительное отображение; последовательность запоминания информации; записанные символы языка; элементы информации; база данных; набор взаимосвязанных файлов.

**5. Translate the following word combinations**

Data resource; storage resource; network resource; security resource; system resource.

Communication facilities; data base facilities; display facilities; management facilities.

Distance control; device control; keyboard control; position control; program control.

Computer storage; laser storage; file storage; disk storage; data storage hierarchy.

Character sequence; instruction sequence; message sequence; pulse sequence.

Batch file; catalog file; data file; help file; input file; output file; menu file; user file.

Command input; data input; disk input; file input; keyboard input; program input.

**6. Match the terms and definitions**

1. Computer a) the set of instructions that the operations of computers;
2. Computer literacy b) a part of a computer, entering data into the device;
3. A program c) facts unorganized but able to be organized;
4. Data d) the output of a data processing system;
5. Data processing . e) possessing sufficient knowledge of how computers work and what they can do to use them as problem-solving tools;
6. Data processing f) a series of operations that results in the conversion of data system into useful information;
7. Input g) an electronic device performing calculations of numerical dat
8. Output h) an electronic device accepting the data processing results from the computer and displaying them;
9. Useful information i) a set of related files;
10. Data bank j) the resources required to accomplish the processing of data. These resources are personnel, material, facilities and equipment.

**7. Read and translate the sentences**

1. Data are processed to become useful information. 2. We use the term data processing to include the resources applied for processing of information. 3. Resources required for accomplishing the processing of data are called data processing system. 4. Processing is a series of operations converting inputs into outputs. 5. Facilities are required to house the computer equipment. 6. Egyptians used the information to predict crop yields. 7. Information to be put into the computer for processing should be coded into ones and zeroes. 8. Processing is operations on data to convert them into useful information. 9. The first machines designed to manipulate punched card data were widely used for business data processing. 10. Hollerith built one machine to punch the holes and the other to tabulate the collected data.

# Grammar

## ДЕЙСТВИТЕЛЬНЫЙ ЗАЛОГ

### Active Voice

Глагол в действительном залоге (the Active Voice) выражает действие, которое производит само лицо (или предмет), являющееся подлежащим:

The workers built the house last year. Рабочие построили дом в прошлом году.

## СТРАДАТЕЛЬНЫЙ ЗАЛОГ

### PASSIVE VOICE

Глагол в страдательном залоге выражает действие, которое испытывает лицо (или предмет), являющееся подлежащим, со стороны другого лица (или предмета):

The house was built by the workers.

Дом был построен в прошлом году.

**Образование форм страдательного залога**

Формула образования: to be + Participle II

Формы страдательного залога в английском языке образуются при помощи вспомогательного глагола to be в соответствующей форме действительного залога и причастия прошедшего времени (Participle II) смыслового глагола. Глагол to be является спрягаемой частью сказуемого и указывает на время, лицо, число:

I was told a funny story.

Мне рассказали забавную историю.

Предлоги by и with употребляются для того, чтобы показать, кем выполняется действие, выраженное сказуемым в пассивном залоге.

Who the device was invented by?

Кем был изобретен прибор?

Для образования вопросительной формы вспомогательный глагол to be ставится перед подлежащим, а остальная часть временной формы - после подлежащего:

Is our lab equipped with modern computers?

Наша лаборатория оборудована современными компьютерами?

Для образования отрицательной формы после вспомогательного глагола to be ставится отрицательная частица not:

I was not offered a good job.
Мне не предложили хорошую работу.

**Простые времена в пассиве**

I am asked.

I was asked.

I shall be asked.

**Длительные времена в пассиве**

I am being asked.

I was being asked.

**Совершенные времена в пассиве**

I have been asked.

I had been asked.

Способы перевода глаголов в формах страдательного залога

Глаголы в формах Indefinite Passive могут переводиться на русский язык:

а) глаголами в страдательном залоге:

Moscow was founded by Yury Dolgoruki in 1147

Москва была основана Юрием Долгоруким в 1147 году.

б) глаголами в действительном залоге (часто глаголами с окончанием -ся, сь):

Man is constantly exposed to invisible electronic waves.

Человек постоянно подвергается воздействию невидимых электромагнитных волн.

в) неопределенно-личными предложениями:

The investigations were carried out with the ultra sound device.

Исследования были выполнены при помощи ультразвуковых приборов.

7. Глаголы в формах Continuous Passive переводятся на русский язык:

а) формами глагола несовершенного вида с окончанием -ся (-сь):

Work in this field is being conducted jointly by scientists of different countries.

Работа в этой области ведется совместно учеными разных стран.

б) неопределенно-личными предложениями:

Ultrasound is being used in diagnostics and treatment.

Ультразвук применяется в диагностике и лечении.

8. Глаголы в формах Perfect Passive переводятся, как правило, формами глаголов совершенного вида (действительного, страдательного залогов), неопределенно-личными предложениями:

The equipment had been repaired by the time the work began.

Оборудование было отремонтировано к началу работ.

9. Глаголы типа: to ask, to answer, to send, а также глаголы с предлогами типа: to rely on (upon), to wait for, to speak about, to look at, to aim at и т.д. в страдательном залоге переводятся неопределенно-личными предложениями, причем, если глагол с предлогом, то перевод следует начинать с предлога:

The doctor **has been sent for**. За доктором послали.

# Practice

**1. Make these sentences from Active Voice into Passive Voice**

1. Nobody has used this room for ages.
2. We will give you the keys tomorrow.
3. Someone is interviewing Dr Johnson at the moment.
4. By the time I arrived, someone had already opened all your letters.
5. We usually talk briefly about the problems of the family at dinner time.

2**. Choose the right answer**

1. This theatre … (build) over 100 years ago.

a. had been built

b. has been built

c. was built

2. Is your car still for sale? — No. It … already (sell).

a. has been sold

b. had been sold

c. was sold

3. Sometimes mistakes … (make).

a. are made

b. are being made.

c. have been made

4. For the past few days I (work) in Jack's office, as my own … (decorate).

a. have been working/ is being decorated

b. worked/ decorated

c. am worked/ is being decorated.

5. While my friend … (talk) to me, his wallet .. (steal).

a. was being talked/ was being stolen

b. was talking/ was stolen

c. talked/stole

6. Where is your friend Bob? — - I don't know. He … (not/ seen) resently.

a. hasn't seen

b. didn't see

c. hasn't been seen

7. If someone … (report) you to the police, you … (make) to pay a big fine.

a. reports/ will be made

b. will report/ will make

c. is reported/ will be made

8. Professor … ( give) another lecture at the same time next week.

a. will have been given

b. will be given

c. will give

9. Look at the dust in here! It … (look) as if this room (not/clean) … for a month.

a. is looked/ hasn't cleaned

b. looks/ hasn't been cleaned

c. has looked/ isn't cleaned

10. The door … (open) and a young lady … (come in). It should be admitted that the door … (open) by herself.

a. opened/ came in/ was opened

b. was opened/  came in/ was opened

c. opened/ came in/ opened

3. **Translate the sentences with Passive Voice into the sentences with Passive Voice**

*Пример: I asked him about his job. / He was asked by me.*

1. I asked the teacher to speak a little bit louder, as I couldn't hear anything.
2. We did all the work by the evening.
3. Recently my boss offered her to take a rest from the office.
4. Someone took my documents.
5. The fire destroyed the whole village.
6. He paid me after the concert.
7. The hostess showed us all rooms in the house.

4. **Translate the sentences into English using Passive Voice**

1. Почта была доставлена в срок.
2. Он попытался спрятаться, но все равно был замечен полицейскими.
3. Посуда должна быть вымыта к моему приходу.
4. Она была приглашена на передачу в качестве ведущей.
5. Это здание было возведено во второй половине 19го века.
6. Список приглашенных был тщательно проверен.
7. Его имя не было найдено в списке.
8. К соглашению, так и не удалось прийти.
9. С вами приятно иметь дело!
10. Они постоянно вмешивались со своими вопросами.
11. В этот клуб легко могут не впустить, придравшись к одежде.
12. В детстве мне очень хотелось присматривать за младшим братом.

13. Ты не тот человек, на которого я когда-нибудь смогу положиться.

14.Его робость всегда была причиной насмешек.

15. Немедленно пошлите за доктором!

5. **Translate the sentences into Past Indefinite or Past Continuous Passive.**

*Например: A new museum (open). / A new museum was opened.*

1. The child (ask) to read him the book
2. Such kind of mistake (make) by even wise people.
3. A pleasant melody (play) when she appeared in the living – room.
4. Every time our parents (tell) what we should do.
5. The ancient tower (build) of stone.
6. Everyone was glad, the problem (resolve).
7. Two days ago she (meet) in the market.
8. I (invite) to the club by Jim.
9. When I was young, I (teach) English.

6. **Complete the sentences using Passive Voice and translate them into English**

1. Керри попросили удалиться…
2. Из-за погодных условий самолет…
3. Это очень ветхие постройки, их…
4. Задание было… прежде чем…
5. Эта новость никогда не…
6. О моей собаке хорошо…
7. Доктор был… в приемную…

# Topic 20

# DATA PROCESSING SYSTEMS

**New words to the text**

manual — ручной, выполняемый вручную

to take advantage of smth — воспользоваться ч.-л.

capability — способность; возможность; характеристика

accuracy — точность; правильность; четкость (изображения)

correctly — правильно; верно

to eliminate — устранять; удалять; отменять; ликвидировать

error-prone — подверженный ошибкам

to remain vulnerable — оставаться уязвимым, чувствительным

invalid data — неверные, неправильные, недопустимые данные

communications networks — сети передачи данных; сети связи

travel — перемещение; прохождение; путь; ход

instant response — мгновенный ответ (реакция)

to respond — отвечать; реагировать

access —доступ; обращение; обращаться, иметь доступ

capacity of storage — объем (емкость) памяти

to retrieve — извлекать, выбирать (данные); восстанавливать (файл)

value — значение; величина; значимость; ценность; оценка; оценивать

objective — цель; требование; целевая функция

cost-effective — экономичный; экономически оправданный

challenge — трудность; препятствие; представлять трудность

**2. Read and translate the text**

## ADVANTAGES OF COMPUTER DATA PROCESSING

Computer-oriented data processing systems or just computer data processing systems are not designed to imitate manual systems. They should combine the capabilities of both humans and computers. Computer data processing systems can be designed to take advantage of four capabilities of computers.

1.*Accuracy.* Once data have been entered correctly into the computer component of a data processing system, the need for further manipulation by humans is eliminated, and the possibility of error is reduced. Computers, when properly programmed, are also unlikely to make computational errors. Of course, computer systems remain vulnerable to the entry by humans of invalid data.

*2.Ease of communications.* Data, once entered, can be transmitted wherever needed by communications networks. These may be either earth or satellite-based systems. A travel reservations system is an example of a data communications network. Reservation clerks throughout the world may make an enquiry about transportation or lodgings and receive an almost instant response. Another example is an office communications system that provides executives with access to a reservoir of date, called a corporate data base, from their personal microcomputer work stations.

3.*Capacity of storage.* Computers are able to store vast amounts of information, to organize it, and to retrieve it in ways that are far beyond the capabilities of humans. The amount of data that can be stored on devices such as magnetic discs is constantly increasing. All the while, the cost per character of data

stored is decreasing.

4.*Speed.* The speed, at which computer data processing systems can respond, adds to their value. For example, the travel reservations system mentioned above

would not be useful if clients had to wait more than a few seconds for a response. The response required might be a fraction of a second.

Thus, an important objective in the design of computer data processing systems is to allow computers to do what they do best and to free humans from routine, error-prone tasks. The most cost-effective computer data processing system is the one that does the job effectively and at the least cost. By using computers in a cost-effective manner, we will be better able to respond to the challenges and opportunities of our post-industrial, information-dependent society.

**3. Answer the questions using the text**

1. What capabilities should data-processing systems combine when designed? 2. What are the main advantages of computers? 3. What do you know of computers accuracy? 4. What is the function of communication networks? 5. Give examples of a data communication network. 6. What do you understand by capacity storage? 7. What other values of computer data processing systems do you know? 8. What is an important objective in the design of computer data processing systems? 9. What is the most effective computer data processing system? 10. What is the best way of responding to the challenges and opportunities of our post-industrial society?

**4. Give the English equivalents**

Система обработки информации компьютером; система ориентирования на обработку данных компьютером; сочетать возможности человека и машины; ограничивать управление; вряд ли допустят ошибку; оставаться уязвимым; недопустимые данные; легкость осуществления связи; сеть передачи информации; системы, основанные на использовании спутников; служащие по резервированию жилья; получить мгновенный ответ; наводить справки; хранилище данных; корпоративная база

данных; объем памяти; запоминать огромное количество информации; извлекать информацию; добавить значимости; упомянутый выше; доля секунды; подверженный ошибкам; экономически оправданный.

## TEST

### 1. Complete the sentences using the proper word

1. Computer data _ system frees humans from routine error-prone tasks.
   a) counting; b) computing: c),processing
2. Computers can store vast amount of information to organize it and it.
   a) to travel; b) to retrieve; c) to respond
3. The entered data can be transmitted by networks.
   a) communications; b) conversions; c) procession
4. The possibility of _ is reduced if data were correctly put into the data processing system

   a) character; b) access; c) error
5. Computer data processing systems can at a fraction of a second.
   a) receive; b) respond; c) retrieve
6. As soon as data were entered into the system correctly, the human is limited.
   a) computation; b) information; c) manipulation
7. The amount of data stored on magnetic discs is constantly _
   a) decreasing; b) increasing; c) eliminating

### 2. Match the columns

1. Inputting a) saving information for further processing;
2. Character . b) the process of producing useful information;
3. Database c) meaningful collections of related characters;
4. Data elements d) the most common input device;
5. Controlling e) the part of the computer that receives and stores data for processing;

6. Outputting f) directing the sequence of the operations performed;
7. Memory g) *a* written language symbol;
8. Record h) a collection of related data elements
9. Keyboard i) a set of related facts;
10. Storing j) the process of entering collected into a data processing system;

# Grammar

# The Complex Sentence

## 1. Сложноподчиненное предложение

Сложноподчиненное предложение состоит из главного и придаточного предложений. Придаточное предложение поясняет главное и соединяется с ним при помощи подчинительных союзов и союзных слов:

*Я думаю,* *что они ответят на ваше письмо завтра.*

(главное предложение) (придаточное предложение)

*Они получат вашу телеграмму вечером*, *если вы ее отошлете сейчас.*

(главное предложение) (придаточное предложение)

Если в главном и придаточном предложении одно и то же подлежащее, то в русском языке в придаточном предложении оно может опускаться. В английском языке наличие подлежащего в придаточном предложении

обязательно.

Сравните:

**He writes that he is coming to Moscow.** Он пишет, что приедет в Москву.

В английском языке, в отличие от русского, придаточное предложение не отделяется запятой от главного, если главное стоит перед придаточным, и может отделяться запятой, если придаточное предшествует главному:

**I know that they are at home.** Я знаю, что они сейчас дома.

**When I was in Kiev, I met Petrov.** Когда я был в Киеве, я встретил там Петрова.

**2. Виды придаточных предложений.**

Придаточные предложения делятся на именные (выполняющие функцию имени существительного — подлежащего, дополнения, именной части сказуемого) и обстоятельственные.

а) Примером именного придаточного предложения может служить дополнительное придаточное. Дополнительные придаточные предложения выполняют в сложном предложении функцию прямого дополнения и отвечают на вопрос 'что?'. Они соединяются с главным предложением чаще всего при помощи союза **that** - что и союзных слов. В отличие от русского союза что, союз **that** часто опускается:

**We know (that) they're doing well.** Мы знаем, что они хорошо учатся.

**I know they are here.** Я знаю, что они здесь.

Такое присоединение дополнительного придаточного предложения к главному называется бессоюзным.

б) Примером обстоятельственных придаточных предложений могут служить придаточные предложения времени. Обстоятельственные придаточные предложения времени указывают время совершения действия, отвечают на вопрос'**when?**' - когда и вводятся подчинительным союзом **when** когда и рядом других союзов:

**When I was a student, I lived in Kiev.** Когда я был студентом, я жил в

Киеве.

в) В английском языке обстоятельственные придаточные предложения времени могут также вводиться союзами:

**till (untill)** пока, до тех пор, пока;

**as soon as** как только;

**before** прежде чем, до того как;

**after** после того как;

**while** в то время как.

**Please stay here until I return.** Оставайтесь здесь, пожалуйста, пока я не вернусь.

**Please wait for him , here till he comes back.** Пожалуйста, подождите его здесь, пока он не вернется.

Обратите внимание на то, что в русском языке после союзов до тех пор, пока, пока в придаточном предложении времени употребляется усилительная частица не, которая на английский язык не переводится.

**As soon as he saw us, he came towards** [tɔ:dz] **us**. Как только он увидел нас, он направился к нам.

**Please give me this book to read after you have finished it.** Дайте мне, пожалуйста, почитать эту книгу, после того как вы ее прочитаете.

**You should see the doctor before you go back to work.** Вам нужно сходить к врачу, прежде чем возвращаться на работу.

**While I'm writing this, you can read a newspaper.** Пока (= в то время, как) я пишу это, вы можете почитать газету.

г) Другим примером обстоятельственных придаточных предложений может служить условное придаточное предложение, которое выражает условие, необходимое для совершения действия главного предложения. Условные предложения чаще всего вводятся союзом **if** - если:

**Can I have this book to read if it's interesting?** Разрешите мне взять эту книгу прочитать, если она интересная?

д) Обстоятельственные придаточные предложения причины указывают на причину совершения действия и отвечают на вопрос **'why?'** почему? Они вводятся подчинительными союзами **because** потому что и **as** так как, поскольку.

**I couldn't go to the Institute yesterday because I was ill.** Я не мог пойти в институт вчера, потому что был болен.

**As my lessons begin at half past eight, I have to get up at seven in the morning.** Поскольку (так как) мои уроки начинаются в половине девятого, я должен вставать в семь часов утра.

**My friend works hard at his English, as he wants to speak the language well.** Мой друг упорно работает над английским языком, так как хочет хорошо говорить по-английски.

*Примечание*. Придаточные обстоятельственные предложения причины могут стоять как перед главным предложением, так и после него, причем союз **because** употребляется, как правило, когда придаточное предложение стоит после главного.

**3. Интонация.**

Если придаточное предложение предшествует главному, то оно чаще всего произносится с восходящим тоном, например:

**If you are ↑ ill, you should certainly stay in ↓ bed.** Если вы больны, вы, безусловно, должны лежать в постели (отлежаться).

# Practice

**1. Identify the independent and subordinate clauses in the following sentences and determine whether they are complex or compound-complex. You can check your answers below.**

1. Jason decided to stay up late because he had a lot of homework to do.
2. If you hurry, we might get to school on time.

3. Although Monica had a cold, she went to school because she had a test.
4. While washing the car, Todd slipped on the soap and he fell.
5. Dad takes the train to work even though he has a car.
6. After Mom arrived, she put the disk in the DVD player and we watched a great movie.
7. Even though his heart pounded with dread, Ben bolted up the stairs, and he checked out the strange noise.
8. Molly baked brownies since she had nothing else to do.
9. Karen made a list of what was needed, and she double-checked it so she wouldn't forget anything.
10. Frank had a good sense of humor, so he laughed a lot.

**2. Say which of the following sentences are compound and which are complex**

1. The house was destroyed in the fire, but the whole family was saved.
2. Walking through the wood, he saw a fox that was following him.
3. If I do not get this job, I will start a business.
4. He said that he was so disappointed that he would not try again.
5. The men who rule the world with their pens are mightier than those who rule the world with their swords.
6. The evil that men do lives after them.
7. All that glitters is not gold.
8. Neither the color nor the design of this cloth appeals to me.

# Topic 21
# The Development of Computers in the USA

**Some new words to the text:**

| | |
|---|---|
| Microprocessor | микропроцессор |
| To do calculations | делать расчеты, вычисления |
| To motivate | побуждать |
| Invention | изобретение |
| Technology of semiconductors | технология полу-проводимости |
| Building block | строительный блок |
| Handling tool | ручное управление |
| Computing power | компьютерная мощь |
| Keyboard | клавиатура |

Read ant translate the text:

# The Development of Computers in the USA

In the early 1960s, when computers were hulking mainframes that took up entire rooms, engineers were already toying with then – extravagant notion of building a computer intended for the sole use of one person, by the early 1970s, researches at Xerox's Polo Alto Research Center (Xerox PARC) had realized that the pace of improvement in the technology of semiconductors – the chips of silicon that are the building blocks of present – day electronics – meant that sooner or later the PC would be extravagant no longer. They foresaw that computing power would someday be so cheap that engineers would be able to afford to devote a great deal of it simply to making non-technical people more comfortable with these new information-handling tools, in their labs, they

developed or refined much of what constitutes PCs today, from ‘’mouse’’ pointing devices to software ‘’windows’’.

Although the work at Xerox PARC was crucial, it was not the spark that took PCs out of the hands of experts and into the popular imagination. This happened in January 1975, when the magazine Popular Electronics put a new kit for hobbyists, called the Altair, on its cover, for the first time, anybody with 400 dollars and a soldering iron could buy and assemble his own computer. The Altair inspired Steve Wosniak and Steve Jobs to build the first Apple computer, and a young college dropout named Bill Gates to write software for it. Meanwhile, the person who deserves the credit for inventing the Altair, an engineer named Ed Roberts, left the industry he had spawned to go to medical school. Now he is a doctor in a small town in central Georgia.

To this day, researchers at Xerox and elsewhere pooh-pooh the Altair as too primitive to have made use of the technology they felt was needed to bring PCs to the masses. In sense, they are right. The Altair incorporated one of the first single-chip microprocessor – a semiconductor chip, that contained all the basic circuits needed to do calculations – called the Intel 8080. Although the 8080 was advanced for its time, it was far too slow to support the mouse, windows, and elaborate software Xerox had developed. Indeed, it wasn’t until 1984, when Apple Computer’s Macintosh burst onto the scene, that PCs were powerful enough to fulfill the original vision of researchers.

Researchers today are proceeding in the same spirit that motivated Kay and his Xerox PARC colleagues in the 1970s: to make information more accessible to ordinary people. But a look into today’s research labs reveals very little that resembles what we think of now as a PC. For one thing, researchers seem eager to abandon the keyboard and the monitor that are the PCs trademarks. Instead they are trying to devise PCs with interpretive powers that are more humanlike – PCs that can hear you and see you, can tell when you’re in a bad mood and know to ask questions when they don’t understand anything.

Exercise 1. **Read and translate the words without dictionary:**

Electronics, microprocessor, technology, computer, Xerox, extravagant, chip, calculation, version.

Exercise 2. **Find in the text above the English equivalents for the following words and expressions:**

- ручное управление
- эксперт
- клавиатура
- электроника
- компьютерная мощь
- изобретение
- микропроцессор
- технология полупроводимости
- делать вычисления
- достаточно мощный
- строительный блок

Exercise 3. **Make up different word-combinations using the following words (A, B) and translate them:**

| **A** | **B** |
|---|---|
| Handling | chip |
| Popular | school |
| Hulking | version |
| Non-technical | power |
| Semiconductor | tools |
| Medical | mainframes |
| Original | imagination |
| Interpretive | people |

**Read and translate the text, then do some exercises.**

# A Bite of the Apple in Ireland

In 1980, the American computer manufacturer Apple opened a factory in Cork, Ireland`s second city, in order to produce and distribute Apple Mac computers for Europe. In 1999, the huge demand for Apple`s new product, the iMac computer, led them to add a call centre to their operations in Cork in order to process customers` orders and queries, and in 2002 the Apple Centre in Cork became Apple`s headquarters for Europe. Although there is less manufacturing done in Cork today, the Centre currently employs 1,200 people working in the areas of sales, financial management, planning, software development and testing, and customer service.

The call centre has now expanded to cover the whole of Europe. This means that anyone in a European country phoning Apple with a query or technical problem with their Apple computer will speak directly to one of the multi-lingual operators in Cork. Call centers in general are a huge growth industry in Ireland, and have become one of the country`s top employers.

Exercise 1. **Read the text «A bite of the Apple in Ireland» and put these events in the correct order.**

a. Apple opened a call centre in Cork.

b. Apple first opened a branch of their business in Cork.

c. Cork became Apple`s European headquarters.

d. Apples produced the iMac computer.

Exercise 2. **Are these sentences about the text true or false?**

1. Cork is the most important city in Ireland.

2. Apple`s original business in the Ireland was manufacturing.

3. The iMac computer was a very popular product.

4. Manufacturing is still Apple’s main business in Cork.

5. Over a thousand people work at the Apple Centre in Cork.

6. The call centre only takes phone calls from the UK and Ireland.

7. There are employees at the call centre who speak foreign languages.

8. Call centres employ a lot of people in Ireland these days.

Read and give a brief summary of the text:

# Some First Computer Models

**1. Babbage's Analytical Engine**

In 1832, an English inventor and mathematician Charles Babbage was commissioned by the British government to develop a system for calculating the rise and fall of the tides.

Babbage designed a device and called it an analytical engine. It was the first programmable computer, complete with punched cards for data input. Babbage gave the engine the ability to perform different types of mathematical operations. The machine was not confined to simple addition, subtraction, multiplication, or division. It had its own ‘’memory’’, due to which the machine could use different combinations and sequences of operations to suit the purposes of the operator.

The machine of his dream was never realized in his life. Yet Babbage's idea didn't die with him. Other scientists made attempts to build mechanical, general-purpose, stored-program computers throughout the next century. In 1941 a relay computer was built in Germany by Conrad Zuse. It was a major step toward the realization of Babbage's dream.

**2. The Mark I Computer (1937 – 1944)**

In 1944 in the United States, International Business Machines (IBM) built a machine in cooperation with scientists working at Harvard University under the direction of Prof. Aiken. The machine, called Mark I Automatic Sequence-Controlled Calculator, was built to perform calculations for the Manhattan

Project, which led to the development of atomic bomb. It was the largest electromechanical calculator ever built. It used over 3000 electrically actuated switches to control its operations. Although its operations were not controlled electronically, Aiken's machine is often classified as a computer because its instructions, which were entered by means of a punched paper tape, could be altered. The computer could create ballistic tables used by naval artillery.

The relay computer had its problems. Since relays are electromechanical devices, the switching contacts operate by means of electromagnets and springs. They are slow, very noisy and consume a lot of power.

3. **The ABC (1939 – 1942)**

The work on introducing electronics into the design of computers was going on.

The gadget that was the basis for the first computer revolution was the vacuum tube, an electronic device invented early in the twentieth century. The vacuum tube was ideal for use in computers. It had no mechanical moving parts. It switched flows of electrons off and on at rates far faster than possible with any mechanical device. It was relatively reliable, and operated hundreds of hours before failure. The first vacuum tube computer was built at Iowa University at about the same time as the Mark I. The computer, capable to perform thousands of related computations, was called ABC, the Atanasoff-Berry Computer, after Dr. John Atanasoff, a professor of physics and his assistant, Clifford Berry. It used 45 vacuum tubes for internal logic and capacitors for storage. From the ABC a number of vacuum-tube computers developed.

Soon the British developed a computer with vacuum tubes and used it to decode German messages.

Exercise 1. **Look at the words. Are they nouns, verbs or adjectives?**

*financial Internet electronic print design microchips*

Exercise 2. **Complete this text with words from exercise 1. Use the context to help you**

**A digital era**

Computers have changed the way we do everyday things, such as working, shopping and looking for information. We (1) …… houses with the help of PCs; we buy books or make flight reservations on the (2) ……; we use gadgets that spring to life the instant they are switched on, for example the mobile phone, the music player, or the car ignition, all of which use (3) …… . Many people now work at home, and they communicate with their office by computer and telephone. This is called "teleworking".

With the appropriate hardware and software, a PC can do almost anything you ask. It's a magical typewriter that allows you to type and (4)……. any sort of document. It`s a calculating machine that makes (5) ……. calculations. It`s a personal communicator that lets you interact with friends. It`s a small lab that helps you edit photos and movies. And if you like (6)…… entertainment, you can also use it to relax with games.

Exercise 3. **Match the words in exercise 1 with following definitions.**

1. tiny pieces of silicon containing complex electronic circuits
2. to make or draw plans for something
3. relating to money or how money is manages
4. involving the use of electric current in devices such as TV sets or computer
5. the large system of connected computers around the world
6. to produce text and pictures using a printer

# SUPPLEMENTARY READING

Read and translate the texts:

## Top 20 computer systems

From soldering irons to SparcStations, from MITS to Macintosh, personal computers have evolved from do-it-yourself kits for electronic hobbyists into machines that practically leap out of the box and set themselves up. What enabled them to get from there to here? Innovation and determination. There are top 20 systems that made that rapid evolution possible. Here are some of them:

### MITS Altair 8800

There once was a time when you could buy a top-of-the-line computer for $395. The only catch was that you had to build it yourself. Although the Altair 8800 wasn't actually the first personal computer (Scelbi Computer Consulting`s 8008-based Scelbi-8H kit probably took that honour in 1973), it grabbed attention. MITS sold 2000 of them in 1975 - more than any single computer before it.

Based on Intel`s 8-bit 8080 processor, the Altair 8800 kit included 256 bytes of memory (upgradable, of course) and a toggle-switch-and-LED front panel. For amenities such as keyboard, video terminals, and storage devices, you had to go to one of the companies that sprang up to support the Altair with expansion cards. In 1975, MITS offered 4- and 8-KB Altair versions of BASIC, the first product developed by Bill Gates` and Paul Allen`s new company, Microsoft.

If the personal computer hobbyists movement was simmering, 1975 saw it come to a boil with the introduction of the Altair 8800.

## Apple II

Those of you who think of the IBM PC as the quintessential business computers may be in for a surprise: The Apple II (together with VisiCalc) was what really made people to look at personal computers as business tools, not just toys.

The Apple II debuted at the first West Coast Computer Fair in San Francisco in 1977. With built-in keyboard, graphics display, eight readily accessible expansion slots, and BASIC built-into ROM, the Apple II was actually easy to use. Some of its innovations, like built-in high-resolution colour graphics and a high-level language with graphics commands, are still extraordinary features in desk top machines.

With a 6502 CPU, 16 KB of RAM, a 16-KB ROM, a cassette interface that never really worked well (most Apple It ended up with the floppy drive the was announced in 1978) , and colour graphics, the Apple II sold for $1298.

## Commondore PET

Also introduced at the first West Coast Computer Fair, Commondore`s PET (Personal Electronic Transactor) started a long line of expensive personal computers that brought computers to the masses. (The VIC-20 that followed was the first computer to sell 1 million units, and the Commondore 64 after that was the first to offer a whopping 64 KB of memory.) The keyboard and small monochrome display both fit in the same one-piece unit. Like the Apple II, the PET ran on MOS Technology’s 6502. Its $795 price, key to the Pet’s popularity supplied only 4 KB of RAM but included a built-in cassette tape drive for data storage and 8-KB version of Microsoft BASIC in its 14-KB ROM.

## Xerox Star

This is the system that launched a thousand innovations in 1981. The work of some of the best people at Xerox PARC (Palo Alto Research Center) went into it. Several of these - the mouse and a desktop GUI with icons - showed up two years later in Apple`s Lisa and Macintosh computers. The Star wasn't what you would call a commercial success, however. The main problem seemed to be how much it cost. It would be nice to believe that someone shifted a decimal point somewhere: The pricing started at $50,000.

## IBM PC

Irony of ironies that someone at mainframe-centric IBM recognized the business potential in personal computers. The result was in 1981 landmark announcement of the IBM PC. Thanks to an open architecture, IBM's clout, and Lotus 1-2-3 (announced one year later), the PC and its progeny made business micros legitimate and transformed the personal computer world.

The PC used Intel`s 16-bit 8088, and for $3000, it came with 64 KB of RAM and a $5\ ^{1}/_{4}$-inch floppy drive. The printer adapter and monochrome monitor were extras, as was the colour graphics adapter.

## Compaq Portable

Compaq's Portable almost single-handedly created the PC clone market. Although that was about all you could do with it single-handedly - it weighed a ton. Columbia Data Products just preceded Compaq that year with the first true IBM PC clone but didn't survive. It was Compaq's quickly gained reputation for engineering and quality, and its essentially 100 percent IBM compatibility (reverse-engineering, of course) , that legitimized the clone market. But was it really designed on a napkin?

### Apple Macintosh

Whether you saw it as a seductive invitation to personal computing or a cop-out to wimps who were afraid of a command line, Apple`s Macintosh and its GUI generated even more excitement than the IBM PC. Apple`s R&D people were inspired by critical ideas from Xerox PARK (and practised on Apple`s Lisa) but added many of their own ideas to create a polished product that changed the way people use computers.

The original Macintosh used Motorola's 16-bit 68000 microprocessor. At $2495, the system offered a built-in-high-resolution monochrome display, the Mac OS, and a single-button mouse. With only 128 KB of RAM, the Mac was underpowered at first. But Apple included some key applications that made the Macintosh immediately useful. (It was MacPaint that finally showed people what a mouse is good for.)

# Topic 22

# Computer systems

**New words to the text**

architecture — архитектура; структура

architect — разработчик архитектуры (системы, структуры)

unit — устройство; модуль; блок; элемент; составная часть

accessory equipment — вспомогательные устройства

engineering background — техническая подготовка, квалификация

analyst — аналитик; системный разработчик

product line — серия (компьютерных) продуктов

manufacturer — изготовитель; производитель; разработчик

application programmer — прикладной программист

to simulate — моделировать; имитировать

voltage — напряжение

pressure — давление, сжатие

digital computer — цифровой компьютер

hybrid computer — смешанного типа, аналого-цифровой компьютер

discrete — дискретный; отдельный

continuous quantity — непрерывная величина

on-going process —продолжающийся, постоянный, непрерывный процесс

to rely — основываться на ч.-л.; полагаться

household appliances — домашние приборы / устройства

microwave oven — микроволновая печь

indoor climate control system — система регуляции температуры в доме

2. Read and translate the text

## COMPUTER SYSTEM ARCHITECTURE

As we know all computer systems perform the functions of inputting, storing, processing, controlling, and outputting. Now we'll get acquainted with the computer system units that perform these functions. But to begin with let's examine computer systems from the perspective of the system designer, or architect.

It should be noted that computers and their accessory equipment are designed by a *computer system architect,* who usually has a strong engineering background. As contrasted with the *analyst,* who uses a computer to solve specific problems, the computer system architect usually designs computer that

can be used for many different applications in many different business. For example, the product lines of major computer manufacturers such as IBM, Digital Equipment Corporation and many others are the result of the efforts of teams of computer system architects.

Unless you are studying engineering, you don't need to become a computer system architect. However, it is important that as a potential user, applications programmer or systems analyst you understand the functions of the major units of a computer system and how they work together

**Types of computers**

The two basic types of computers are analog and digital. *Analog computers* simulate physical systems. They operate on the basis of an analogy to the process that is being studied. For example, a voltage may be used to represent other physical quantities such as speed, temperature, or pressure. The response of an analog computer is based upon the measurement of signals that vary continuously with time. Hence, analog computers are used in applications that require continuous measurement and control.

*Digital computers*, as contrasted with analog computers, deal with discrete rather than continuous quantities. They count rather than measure. They use numbers instead of analogous physical quantities to simulate on-going, or real-time processes. Because they are discrete events, commercial transactions are in a natural form for digital computation. This is one reason that digital computers are so widely used in business data processing.

Machines that combine both analog and digital capabilities are called *hybrid computers.* Many business, scientific, and industrial computer applications rely on the combination of analog and digital devices. The use of combination analog devices will continue to increase with the growth in applications of microprocessors and microcomputers. An example of this growth is the trend toward installing control systems in household appliances such as microwave ovens and sewing machines. In the future we will have complete indoor climate

control systems and robots to do our housecleaning. Analog sensors will provide inputs to the control centres of these systems, which will be small digital computers.

**3. Answer the questions using the text**

1. Who designs computers and their accessory equipment? 2. What is the role of an analyst? 3. Is it necessary for a user to become a computer system architect? 4. What functions do computer systems perform? 5. What types of computers do you know? 6. What is the principle of operation of analog computers? 7. How do digital computers differ from analog computers? 8. Where are digital and analog computers used? 9. What are hybrid computers? 10. Where do they find application?

**4. Give the English equivalents**

Функции ввода, хранения, обработки, управления и вывода информации; познакомиться; системные блоки различные сферы применения; корпорация цифрового оборудования; прикладной программист; системный разработчик; главные устройства компьютерной системы; моделировать физические величины; измерение сигналов; в отличие от; иметь дело скорее с дискретными, чем не-прерывными величинами; в режиме реального времени; коммерческие операции; цифровое вычисление; аналого-цифровые компьютеры; тенденция к установке систем управления; домашние приборы.

**5. Make the nouns of the given verbs using suffixes and translate them**

***A.-er, -or***

To control, to compute, to design, to use, to manufacture, to work, to simulate, to operate, to protect, to process, to deal, to perform, to examine, to program, to execute, to transmit, to convert, to print, to consume, to record.

***B.****-tion, -sion*

To organize, to collect, to combine, to apply (ic), to represent, to add, to corporate, to transact, to compute, to produce, to operate, to execute, to protect, to substitute, to prepare, to invent, to decide, to eliminate, to communicate, to correct, to inform.

**C *-ment***

To require, to measure, to equip, to invest, to accomplish, to improve, to develop, to achieve, to displace, to govern, to move.

# Grammar

Речь какого-либо человека, передаваемая как его подлинные слова, называется прямой.

Если передается только ее содержание, например, в виде дополнительных придаточных предложений, то она называется **косвенной речью**.

Прямая речь выделяется кавычками и считается отдельным предложением. Обратите внимание, что, в отличие от русского языка, кавычки в английском языке пишутся вверху строки. После слов, вводящих прямую речь, обычно ставится запятая, а первое слово прямой речи пишется с большой буквы. В конце прямой речи точка или другой знак препинания ставится внутри кавычек:

**He said, “I need my glasses.”**
Он сказал: «Мне нужны мои очки».
**She told me, “It’s snowing.”**
Она сказала мне: «Идет снег».

**Переход прямой речи в косвенную речь**

Для того, чтобы перевести прямую речь в косвенную, нужно опустить запятую после слов, вводящих прямую речь, и кавычки. Часто косвенная речь в английском языке вводится союзом **that**, который, впрочем, может быть и опущен:

**I said, “It is June.”**
Я сказал: «Сейчас июнь».

**I said (that) it was June.**
Я сказал, что стоял июнь.

Все личные и притяжательные местоимения должны быть изменены в зависимости от лица, от которого ведется повествование:

**Tom and Bob told me, “We need your dictionary.”**
Том и Боб сказали: «Нам нужен твой словарь».

**Tom and Bob told me that they need my dictionary.**
Том и Боб сказали, что им нужен мой словарь.

Все указательные местоимения и наречия времени и места в придаточном предложении должны быть изменены по смыслу предложения:

this → that
these → those
now → then
today → that day
tomorrow → next day

the day after tomorrow → 2 days later

yesterday → the day before

the day before yesterday → 2 days before

ago → before

here → there

**She told me, “I will come to see you tomorrow.”**

Она сказала мне: «Завтра я приду тебя проведать».

**She told me she would come to see me the next day.**

Она сказала, что на следующий день придет меня проведать.

Если сказуемое в главном предложении выражено глаголом в прошедшем времени, то форма глагола в придаточном предложении тоже должна быть изменена на одно из прошедших времен. Этот процесс называется согласованием времен.

**Вопросы в косвенной речи**

В косвенной речи вопросы имеют прямой порядок слов, а вопросительный знак в конце предложения заменяется на точку.

**Общие вопросы** вводятся союзами **if** и **whether**:

I asked, “Have you seen my pen?”

Я спросил: «Ты видел мою ручку?»

I asked him **whether** / **if** he had seen my pen.

Я спросил, видел ли он мою ручку.

**Специальные вопросы** вводятся вопросительными словами:

He wondered: “Who on earth will buy this junk?”

Он удивился: «Ну кто станет покупать эту рухлядь?»

He wondered who on earth would buy that junk.

Он удивился, кто станет покупать эту рухлядь.

Краткий ответ на вопрос косвенной речи вводится союзом **that** без слов **yes** / **no**:

She answered, “Yes, I do.”

Она ответила: «Да».

She answered that she did.

Она ответила утвердительно.

**Повелительные предложения в косвенной речи**

Такие предложения используются со словами **to say**, **to tell**, **to order**, **to ask**, **to beg**, а глагол в повелительном наклонении изменяется в форму инфинитива:

Mom told me, “Clear your room.”

Мама сказала мне: «Прибери свою комнату».

Mom told me to clear my room.

Мама сказала мне прибрать свою комнату.

He said, “Don’t run in the corridor.”

Он сказал: «Не бегайте в коридоре».

He said not to run in the corridor.

Он сказал не бегать в коридоре.

# Practice

**1.Complete the sentences using Indirect Speech**

Helen: I want to tell you something about my holiday in London.

Gareth: What does she say?

You: She says that _____.

Helen: I went to London in July.

Gareth: What does she say?

You: She says that _____.

Helen: My parents went with me.

Gareth: What does she say?

You: She says that _____.

Helen: We spent three days in London.

Gareth: What does she say?

You: She says that _____.

Helen: London is a multicultural place.

Gareth: What does she say?

You: She says _____.

Helen: I saw people of all colours.

Gareth: What does she say?

You: She says that _____.

Helen: Me and my parents visited the Tower.

Gareth: What does she say?

You: She says that _____.

Helen: One evening we went to see a musical.

Gareth: What does she say?

You: She says that _____.

Helen: I love London.

Gareth: What does she say?

You: She says _____.

Helen: The people are so nice there.

Gareth: What does she say?

You: She says _____.

**2. Rewrite the sentences using  Indirect Speech**

Helen: I want to tell you something about my holiday in London.

Gareth: What does she say?

You: She says that _____.

Helen: I went to London in July.

Gareth: What does she say?

You: She says that _____.

Helen: My parents went with me.

Gareth: What does she say?

You: She says that _____.

Helen: We spent three days in London.

Gareth: What does she say?

You: She says that _____.

Helen: London is a multicultural place.

Gareth: What does she say?

You: She says _____.

Helen: I saw people of all colours.

Gareth: What does she say?

You: She says that _____.

Helen: Me and my parents visited the Tower.

Gareth: What does she say?

You: She says that _____.

Helen: One evening we went to see a musical.

Gareth: What does she say?

You: She says that _____.

Helen: I love London.

Gareth: What does she say?

You: She says _____.

Helen: The people are so nice there.

Gareth: What does she say?

You: She says _____.

**3. Choose the right form of the verb**

1. She realized that nobody (will come/would come).
2. We understood that she (sees/saw) nothing.
3. He said he (will arrive/would arrive) in some days.
4. My mother was sure I already (have come/had come).
5. I didn't know they (are/were) in the room.
6. We supposed the rain (will stop/would stop) in some hours.
7. He said he never (has been/had been) to London.
8. We wanted to know who (is singing/was singing) in the next room.
9. I always thought he (is/was) a brave man.
10. When I saw him, he (is working/was working).
11. We know she always (comes/came) in time.
12. They thought he (will have finished/would have finished) his work by the evening.
13. She said she (has/had) a terrible headache.
14. We supposed they (will send/would send) us the documents.
15. He said he (has not seen/had not seen) us for ages.

**4. Use the right form of the verb**

1. Her brother said he never (to see) that film before.
2. He came home and listened: his son (to play) the piano.

3. They didn't worry too much because they (to lock) the door.

4. I asked her when she (to give) me that book to read.

5. We wanted to know if they (to enjoy) the meal.

6. She supposed she (to like) the hotel.

7. I am afraid they (not to come) yet.

8. He wanted to know if the station (to be) far away.

9. Eric doesn't know who (to phone) him at five o'clock.

10. He admitted he (not to be) here for weeks.

11. She was sorry she (to arrive) so late.

12. Jean promised she never (to speak) to me again.

13. Andy said he just (to buy) a new car.

14. My mother decided that she never (to drink) coffee late at night.

15. I hear you already (to find) a new job.

16. We were sure our children (to sleep).

17. I didn't think they still (to discuss) that problem.

18. It is remarkable that you (to come) at last.

19. My doctor thinks I (to be) allergic to pineapples.

20. Sophia knew her aunt (to be) glad to visit her in two days.

**5. Translate the sentences into English**

1. Он надеялся, что проведет следующее лето у моря.

2. Мама сказала, что она хочет остаться дома.

3. Я знал, что ничего особенного с ним не случилось.

4. Нам казалось, что она смеется над нами.

5. Все знали, что он ошибается, но никто не решался сказать ему об этом.

6. Она сказала, что ждет свою подругу уже четверть часа.

7. Они спросили меня, что я буду делать в субботу.

8. Я не был уверен в том, что он поговорил с родителями.

9. Тренер объяснил нам, что это очень опасный вид спорта.

10. Моя двоюродная сестра пообещала мне, что навестит меня через неделю.

11. Отец сказал, что не знает, звонил ли мне кто-нибудь, потому что его не было дома.

12. Она сказала, что не хочет кофе, что она выпьет чай.

13. Он сообщил нам, что делегация прибудет сюда около трех.

14. Я хотел знать, какой язык они изучают и разговаривают ли они по-английски.

15. Он понял, что потерял хорошую возможность заработать немного денег.

16. Она волновалась, потому что не знала, понравятся ли детям ее подарки.

17. Они сказали, что экономическая ситуация хуже, чем они думали.

18. Мы надеялись, что это будет интереснейшая встреча.

19. Мой брат написал мне, что он поступил в университет.

20. Его дядя сказал, что придет к ним в гости.

# Topic23
# Steps in Computer Development
# Topical vocabulary

**Abacus**-счеты, абак(а**), apex,** ['eɪpeks] верхушка, вершина, **census** ['sensəs] перепись, **Difference Engine**-Разностная Машина, **conditional branching** – условный переход, **pebble**- голыш, галька, **tool**-инструмент, **advanced**-передовой, **calculation**-вычисление, **High Middle Ages** – Раннее Средневековье, **numeral system** – числовая система, tabulation – составление таблиц, сведение в таблицы, **common logarithm** – обыкновенный логарифм, **mathematical functions**-математические функции, **square root** – квадратный корень, **trigonometric functions**-тригонометрические функции**, logarithm**- логарифм, **design** – составлять

план; проектировать, **select** – выбирать, отбирать, подбирать, **property**-свойство, **outcome** – результат, **modern** – современный; новый, **ribbon** – лента, узкая полоска, **weaving loom** – ткацкий станок, **weave (wove, woven)** – ткать, плести; вплетать, разг. Плести, сочинять, сплетать(ся), соединять(ся), сливать(ся), покачиваться, качаться, Jacquard loom-[after J. M. Jacquard (1752-1834), Fr inventor] a loom with an endless belt of cards punched with holes arranged to produce a figured weave: also Jacquard loom (жаккардовый ткацкий станок, landmark- веха, р.) **outfit** – снаряжать, экипировать**, analog computers** – аналоговый компьютер, **digital computer** – цифровой компьютер, **flexible**- гибкий, уступчивый, **switch**-переключать; включать; выключать **flurry** – взрыв активности, **electronic circuit** – электронная схема, **vacuum tube** – радио электронная лампа, **capacitor**-конденсатор, **relay** – реле, replace- заменять, notion – понятие; представление, **valve** – электронная лампа, **bulky**- объёмистый, грузный; неуклюжий, **mainframe 101computer**- мейнфрейм, большая ЭВМ, **core –** сердцевина; внутренность; ядро, суть, сущность, **prove (to be)** — оказываться, **vendor** – продавец, поставщик товаров и услуг (напр., оптовый торговец, производитель, импортер).

# First Computers

The earliest known tool for use in computation was the abacus, and it was thought to have been invented in Babylon circa 2400 BC. Its original style of usage was by lines drawn in sand with pebbles. Abaci, of a more modern design, are still used as calculation tools today. This was the first known computer and most advanced system of calculation known to date – preceding Greek methods by 2,000 years.

By the High Middle Ages, the positional Hindu-Arabic numeral system had reached Europe, which allowed for systematic computation of numbers.

During this period, the representation of a calculation on paper actually allowed calculation of mathematical expressions, and the tabulation of mathematical functions such as the square root and the common logarithm (for use in multiplication and division) and the trigonometric functions.

Indeed, when John Napier discovered logarithms for computational purposes in the early 17th century, there followed a period of considerable progress by inventors and scientists in making calculating tools. The apex of this early era of formal computing can be seen in the Difference Engine and its successor the Analytical Engine, which was never completely constructed but was designed in detail, both by Charles Babbage. The Analytical Engine combined concepts from his work and that of others to create a device that if constructed as designed would have possessed many properties of a modern electronic computer. The Analytical Engine was to have had a memory store and a central processing unit (or 'mill') and would have been able to select from among alternative actions consequent upon the outcome of its previous actions (a facility nowadays known as conditional branching). The behaviour of the Analytical Engine would have been controlled by a program of instructions contained on punched cards connected together with ribbons (an idea that Babbage had adopted from the Jacquard weaving loom). One of the defining features of a computer is *programmability*, which is the ability to execute a stored sequence of instructions. In 1801, Joseph-Marie Jacquard developed a loom in which the pattern being woven was controlled by punch cards. The series of cards could be changed without changing the mechanical design of the loom. This was a landmark point in programmability.

The United States Census of 1890 employed a punch card design devised by Herman Hollerith who would later on to found IBM.

In the twentieth century, electricity started to be used for calculating machines. The well-known mechanical calculators were being outfitted with electrical motors. Before World War II, mechanical and electrical analog computers were in wide use, and many thought they were the future of computing. Unlike modern digital computers, they are not very flexible, and need to be reprogrammed or reconfigured manually to switch them from working on one problem to another.

The era of modern computing began with a flurry of development during the years of World War II, as electronic circuits, vacuum tubes, capacitors, and relays replaced mechanical equivalents and digital calculations replaced analog calculations.

Influential on the development of modern computers was Turing's earlier theoretical work, namely his 1936 paper which described the Turing machine, a purely theoretical device invented to formalize the notion of algorithm. The electronic ENIAC (Electronic Numerical Integrator and Computer), was the first working Turing-complete computer designed and used as such.

By the time the ENIAC was successfully operational, the plans for the EDVAC were already in place. The essentials of the EDVAC design have come to be known as the von Neumann architecture: programs are stored in memory along with the data. Unlike the ENIAC, which used parallel processing, it used a single processing unit, which permitted the subsequent advances in reliability and miniaturization that epitomize the computing revolution.

The first working von Neumann machine was the Manchester "Baby" in 1948; it was followed in 1949 by the Manchester Mark I computer which functioned as a complete system using the Williams tube for memory. The Harvard Mark I (officially, the Automatic Sequence Controlled Calculator) was a general purpose electro-mechanical computer built by IBM engineers under

the direction of Harvard mathematician Howard Aiken. Its design was influenced by the Analytical Engine; it used storage wheels and rotary switches in addition to electromagnetic relays, was programmable by punched paper tape, and contained several calculators working in parallel. This University machine became the prototype for Ferranti Corp.'s first computer.

## Ex 1. Find English equivalents in the text.

Счетное устройство, арабские цифры, системные вычисления, математическое выражение, математические функции, тригонометрические функции, умножение, деление, значительный прогресс, сведение в таблицы, современный компьютер, создать устройство, память, процессор, выбирать из ряда вариантов, перфокарта, быть соединенным ремнями, ткацкий станок, определяющая черта, последовательность инструкций, перепись населения, изменение конструкции, быть вытесненным, Вторая Мировая Война, цифровой компьютер, аналоговый компьютер, перепрограммировать вручную, электронная схема, теоретическая работа, воплощать, под руководством, перфолента, работать параллельно.

## Ex. 2. Make up sentences.

1. tool, The earliest, the abacus, known, for use, in computation, was.
2. John Napier, purposes, logarithms, for computational, discovered, in the early $17^{th}$ century.
3. to execute, Pprogrammability, of instructions, is the ability, a stored sequence.
4. can be, The series, without changing, of cards, changed, the mechanical design.
5. analog computers were, and electrical, Before World War II, mechanical, in wide use.
6. working von Neumann, The first, machine was, the Manchester "Baby".

7. processing, The ENIAC, a single, unit, used.

8. storage wheels, It used, in addition, and rotary switches, to electromagnetic relays.

9. It by, punched paper tape, was programmable.

### Ex. 3. Answer the questions to the text.

1. What was the earliest known tool for use in computation?

2. Whan did the positional Hindu-Arabic numeral system reach Europe? Was it a significant step forward?

3. When did a period of considerable progress by inventors and scientists in making calculating tools follow?

4. When did the idea of conditional branching appear?

5. How did Babbage use the desighn of the Jacqard weaving loom?

6. When did the United States Census employ a punch card design devised by Herman Hollerith for the first time?

7. Why were the well-known mechanical calculators outfitted with electrical motors in the twentieth century?

8. What device was the first working Turing-complete computer designed and used as such?

9. Was the Harvard Mark I (officially, the Automatic Sequence Controlled Calculator) a general purpose electro-mechanical computer built by IBM engineers under the direction of Harvard mathematician Howard Aiken?

# Second Generation

The next major step in the history of computing was the invention of the transistor in 1947. This replaced the inefficient valves with a much smaller and more reliable component. Transistorised computers are normally referred to as ‘Second Generation’ and dominated the late 1950s and early 1960s. Despite

using transistors and printed circuits these computers were still bulky and primarily the domain of universities, governments, and large corporations.

In 1955, Maurice Wilkes invented microprogramming, now almost universally used to make the design of a CPU's control unit into a type of programming.

The first high level general purpose programming language, FORTRAN, was also being developed around this time.

In 1960 IBM shipped the transistor-based IBM 1401 series of mainframe, which used punch cards. It the most successful machine up to its time. It used a magnetic core memory. Many aspects of its design were based on the desire to replace punched card machines which were in wide use from the 1920s through the early 70s.

In 1964 IBM announced the 360 series, which was the first family of computers that could run the same software at different combinations of speed, capacity and price. It also pioneered the commercial use of microprograms.

## Ex.1. Find English equivalents in the text.

Работа на компьютере, важный шаг, электронная лампа, транзистор, выместить, господствовать, объемистый, печатная схема, язык программирования, самая удачная машина, широкое использование, оперативная память на магнитных сердечниках, программное обеспечение, сочетание скорости, емкости и цены, коммерческое использование.

## Ex.2. Answer the questions to the text.

1. What was the next major step in the history of computing?

2. When did Maurice Wilkes invent microprogramming?

3. What language was the first high level general purpose programming language?
4. What year did IBM ship the transistor-based IBM 1401 series of mainframe, which used punch cards?
5. What series was the first family of computers that could run the same software at different combinations of speed, capacity and price?

### Ex.3. Find mistakes in these sentences.

1. Under 1960 IBM shipped the transistor-based IBM 1401 series of mainframe.
2. Many aspects of its design is based on the desire to replace punched card machines.
3. Transistorised computers is normally referred to as ‘Second Generation’ and dominated the late 1950s and early 1960s.
4. Despite using transistors and printed circuits this computers were still bulky.
5. The first working von Neumann machine were the Manchester “Baby”.

# Third Generation and Beyond

The explosion in the use of computers began with ‘Third Generation’ computers. These relied on Jack St. Claire Kilby’s invention – the integrated circuit or microchip. The first integrated circuit was produced in September 1958 but computers using them didn’t begin to appear until 1963.

The minicomputer was a significant innovation in the 1960s and 1970s. It brought computing power to more people, not only through more convenient physical size but also through broadening the computer vendor field.

Large scale integration of circuits led to the development of very small processing units.

In 1966 Hewlett-Packard entered the general purpose computer business with its HP-2115 for computation, offering a computational power formerly

found only in much larger computers. It supported a wide variety of languages, among them BASIC, ALGOL, and FORTRAN.

On November 15th 1971 Intel released the world's first commercial microprocessor, the 4004. Fourth generation computers developed, using a microprocessor to locate much of the computer's processing abilities on a single (small) chip. Coupled with one of Intel's other products – the RAM chip, based on an invention by Bob Dennard of IBM, (Kilobits of memory on a single chip) – the microprocessor allowed fourth generation computers to be even smaller and faster than ever before. The 4004 was only capable of 60,000 instructions per second, but later processors (such as the 8086 upon which all of Intel's processors for the IBM PC and compatibles is based) brought ever increasing speed and power to the computers.

## Ex.1. Find English equivalents in the text.

Третье поколение, микрочип, интегральная схема, важное нововведение, миникомпьютер, широкомасштабный, четвертое поколение, соединенный, в секунду, процессор, на одной микросхеме, килобиты памяти, скорость, совместимость двух электронных устройств, поддерживать язык, более удобный размер, широкий спектр языков.

## Ex.2. Suit these phrases.

| | |
|---|---|
| Instructions per | Card |
| the first integrated | Motors |
| punched | Hindu-Arabic numeral system |
| Electrical | Circuit |
| Hindu-Arabic numeral | Second |
| Personal | Computer |

## Ex.3. Agree or disagree.

1. The explosion in the use of computers began with 'Third Generation' computers.

2. The first integrated circuit was produced in September 2013, but computers using them didn't begin to appear until 1963.

3. Large scale integration of circuits led to the development of very big units.

4. On November 15th 1971 Intel released the world's first commercial microprocessor, the 4004.

5. HP-2115 did not support a wide variety of languages, among them BASIC, ALGOL, and FORTRAN.

## Ex.4. Speak about computer history:

### a) the first calculating devices using these words and phrases

(calculation tool, for use in computation, the abacus, system of calculation, the positional Hindu-Arabic numeral system, the representation on, mathematical expressions, logarithms, considerable progress, a calculation on paper, the tabulation of.)

**b**) **mechanical calculators using these words and phrases (**the Analytical Engine, by Charles Babbage, combined concepts from, to have had a memory store, and a central processing unit, able to select from, among alternative actions, controlled by, on punched cards.)

**c) electric computers using these words and phrases (**electricity started, mechanical calculators, be outfitted, electrical motors, The era of modern computing, of development, as electronic circuits, vacuum tubes, was the first working, ENIAC, EDVAC, used parallel processing).

## Ex.5. Fill in the gaps. Use the text.

| |
|---|
| Hindu-Arabic, calculation, a single processing, with electrical, a modern electronic, on paper, electricity, on punched cards. |

1. This was the first known computer and most advanced system of …… known to date – preceding Greek methods by 2,000 year.

2. By the High Middle Ages, the positional….. numeral system had reached Europe, which allowed for systematic computation of numbers.
3. The representation of a calculation ….. actually allowed calculation of mathematical expressions.
4. The Analytical Engine if constructed as designed would have possessed many properties of ……..computer.
5. The behavior of the Analytical Engine would have been controlled by a program of instructions contained……..
6. In the twentieth century, ……..started to be used for calculating machines.
7. EDVAC used ……unit, which permitted the subsequent advances in reliability and miniaturization that epitomize the computing revolution.
8. The well-known mechanical calculators were being outfitted …….motors.

## Ex. 6 . Translate from Russian into English. Use the text.

1.Первым инструментом, который использовали для вычислительных целей, были счеты.
2.Арабские цифры дали возможность отображать математические вычисления на бумаге.
3. Аналитическая машина так и не была собрана полностью, но проект устройства бал разработан детально.
4. Аналитическая машина должна была иметь запоминающее устройство и процессор.
5. В 20 веке началось использование электричества для работы калькуляторов.
6. Эра современных компьютеров началась с появлением электронных схем и вакуумных трубок.
7. Аналоговые компьютеры были вытеснены цифровыми компьютерами.

8. В отличие от ENIAC, использовавшего параллельные компьютеры, EDVAC использовал один процессор.
9. Mark I был многофункциональным электро-механическим компьютером, который построили инженеры IBM под руководством Г. Аикина.

# Supplementary Reading

Read and translate the text

# Analog Computers Vs. Digital Computers

Analog computing is the oldest form of computing, with primitive analog computers discovered that date as far back as 100 BC. Modern digital computing is widely thought to have superseded analog, and for the most part it has, but not out of sheer superiority. Electric analog computing is actually better for certain very particular applications, and continues to be researched today.

## What is Analog?

Analog computers use continuous physical properties for calculations. An analog magnetic tape, for example, manipulates magnetism to record sound. The magnetic imprint on the tape is a direct analog of the sound, and is read back by a reader. An analog computer uses physical properties in the same way. Analog computers have been built using mechanical, hydraulic, optical and electric principles.

## Electric Analog Computers

An electric analog computer is different from a digital computer in what it uses the electricity for. Digital computers use electricity to create binary code, where an electric analog computer uses the properties of electricity to replace

the mechanical features of previous analog computer designs. For example, voltage is similar to water pressure and amps to total water flow, so these properties can be used to convert a hydraulic design into an electronic one.
An easy to understand example is the difference between how data is encoded on a CD and a vinyl record. The CD is digital, encoded with a pattern that simulates binary code, which is read by a laser and converted into useful data. The vinyl record is a direct analog of the data itself.

## Analog Computers Strengths

Because analog computers do not have to encode and decode from binary, and instead use the physical properties of electricity directly, the functions they can perform are done at a substantial fraction of the speed of light, and are therefore dramatically faster than what even the most powerful supercomputer is capable of. Calculations that are very difficult for a digital computer can be done with great speed by an electric analog computer.

## Analog Computers Weaknesses

The problems with analog computers stem from the same electrical phenomenon upon which the computer is based. Just as a digital computer is slower because it has to work in and out of binary code to accomplish anything, analog computers are subject to electrical problems and limitations such as the noise floor of its signals, the finite nature of an electron's charge, microelectronic parasitic effects, temperature issues and non-linearities. It is simplest to look at electric analog computing as an improvement on past analog forms, but still suffering from problems analogous to hydraulic and mechanical computing.

## Analog Computers Today

While the digital model overwhelmingly dominates computing today, analogs remain a research curiosity precisely because, in theory, they are much

faster at particular tasks. Both Indiana University and Harvard University continue to research analog computing applications.

Read and translate the text

**Storage and Retrieval of Data**

Associated with the CPU is the main storage, or memory, where results or other data are stored for periods of time ranging from a small fraction of a second to days or weeks before being retrieved for further processing. Once made up of vacuum tubes and later of small doughnut-shaped ferromagnetic cores strung on a wire matrix, main storage now consists of integrated circuits, each of may contain billions ofsemiconductor devices. Where each vacuum tube or core represented one bit and the total memory of the computer was measured in thousands of bytes (or kilobytes, KB), modern computer memory chips represent hundreds of millions of bytes (or megabytes, MB) and the total memory of both personal and mainframe computers is measured in billions of bytes (gigabytes, GB) or more. Read-only memory (ROM), which cannot be written to, maintains its content at all times and is used to store the computer's control information. Random-access memory (RAM), which both can be read from and written to, is lost each time the computer is turned off. Modern computers now include cache memory, which the CPU can access faster than RAM but slower than the registers; data in cache memory also is lost when the computer is turned off.

Programs and data that are not currently being used in main storage can be saved on auxiliary or secondary storage. Although punched paper tape and punched cards once served this purpose, the major materials used today are magnetic tape and disks and flash memory devices, all of which can be read from and written to, and two types of optical disks, the compact disc (CD) and its successor the digital versatile disc (DVD). When compared to RAM, these are less expensive (though flash

memory is more expensive than the other two), are not volatile (i.e., data is not lost when the power to the computer is shut off), and can provide a convenient way to transfer data from one computer to another. Thus operating instructions or data output from one computer can be stored and be used later either by the same computer or another.

In a system using magnetic tape the information is stored by a specially designed tape recorder somewhat similar to one used for recording sound. Magnetic tape is now largely used for offsite storage of large volumes of data or major systems backups. In magnetic and optical disk systems the principle is the same; the magnetic or optical medium lies in a path, or track, on the surface of a disk. The disk drive also contains a motor to spin the disk and a magnetic or optical head or heads to read and write the data to the disk. Drives take several forms, the most significant difference being whether the disk can be removed from the drive assembly. Flash memory devices, such as USB flash drives, flash memory cards, and solid-state drives, use nonvolatile memory that can be erased and reprogrammed in blocks.

Removable magnetic disks made of mylar enclosed in a plastic holder (older versions had paper holders) are now largely outdated. These floppy disks have varying capacities, with very high density disks holding 250 MB—more than enough to contain a dozen books the size of Tolstoy's *Anna Karenina.* Internal and external magnetic hard disks, or hard drives, are made of metal and arranged in spaced layers. They can hold vastly more data than floppies or optical disks, and can read and write data much faster than floppies. As hard disks dropped in price, they became increasingly included as a component of personal computers and replaced floppy disks as the standard media for the storage of operating systems, programs, and data.

Compact discs can hold hundreds of megabytes, and have been used, for example, to store the information contained in an entire multivolume

encyclopedia or set of reference works. DVD is an improved optical storage technology capable of storing as much as ten times the data that CD technology can store. CD–Read-Only Memory (CD-ROM) and DVD–Read-Only Memory (DVD-ROM) disks can only be read—the disks are impressed with data at the factory but once written cannot be erased and rewritten with new data. The latter part of the 1990s saw the introduction of new optical storage technologies: CD-Recordable (CD-R) and DVD-Recordable (DVD-R, DVD+R), optical disks that can be written to by the computer to create a CD-ROM or DVD-ROM, but can be written to only once; and CD-ReWritable (CD-RW), DVD-ReWritable (DVD-RW and DVD+RW), and DVD–Random Access Memory (DVD-RAM), disks that can be written to multiple times.

Flash memory devices, a still more recent development, are an outgrowth of electrically erasible programmable read-only memory. Although more expensive than magnetic and optical storage technologies, flash memory can be read and written to much faster, permitting shorter boot times and quicker data access and storage. Because flash memory also is resistant to mechanical shock and has become increasingly compact, a USB flash drive allows for the easy, portable external storage of large quantities of data. Solid-state drives are more easily accessed and written to than magnetic hard drives and use less power, and have become common in high-end, lightweight notebook computers and in high-performance computers. Flash memory is also used in computer tablets and smartphones. Hybrid drives, which combine a smaller amount of flash memory with a large magnetic hard drive, permit the economical storage of large amounts of data while benefitting from a more responsive access to frequently used but only occasionally changed operating system and program files.

Data are entered into the computer and the processed data made available via input/output devices, also called peripherals. All auxiliary storage devices are used as input/output devices. For many years, the most popular input/output medium was the punched card. The most popular input devices are the computer

terminal

and internal magnetic hard drives, and the most popular output devices are the computer display screen associated with a terminal (typically displaying output that has been processed by a graphics processing unit) and the printer

. Human beings can directly communicate with the computer through computer terminals, entering instructions and data by means of keyboards much like the ones on typewriters, by using a pointing device such as a mouse, trackball, or touchpad, or by speaking into a microphone that is connected to computer running voice-recognition software. The result of the input may be displayed on a liquid-crystal

, light-emitting diode, or cathode-ray tube

screen or on printer output. Another important input/output device in modern computers is the network card, which allows the computer to connect to a computer network and the Internet using a wired or radio (wireless) connection. The CPU, main storage, auxiliary storage, and input/output devices collectively make up a cumputer system.

# Grammar

**Неопределенные местоимения some, any, no, every и их производные**

Местоимение **some** и его производные **(somebody, someone, something)** употребляются в утвердительных предложениях, **any** и его производные **(anybody, anyone, anything)** — в вопросительных и отрицательных предложениях, а **no** и его производные **(nobody, no one, nothing)** — в отрицательных предложениях (в последнем случае глагол-сказуемое стоит в утвердительной форме). Сложные местоимения, в состав которых входит **body** или **one,** употребляются только в отношении лиц, а сложные местоимения, в состав которых входит **thing,** — в отношении

неодушевленных предметов. **Any** и его производные в утвердительном предложении имеют значение **любой:**

Which journal do you want?

**Any** will do.

Какой журнал вам нужен?

**Любой** подойдет.

**Употребление местоимений some, any, no, every**

| **Тип предложения** | **Местоимение** | **Перевод** |
|---|---|---|
| **Утвердительное** | **some**<br>**somebody, someone**<br>**something**<br>**somewhere**<br>**every**<br>**everybody, everyone**<br>**everything**<br>**everywhere** | **некоторый, несколько, какой-то**<br>**кто-то**<br>**что-то**<br>**где-то**<br>**каждый, всякий**<br>**всякий, каждый, все**<br>**все**<br>**везде, всюду** |
| **Вопросительное** | **any**<br>**anybody, anyone**<br>**anything**<br>**anywhere** | **какой-нибудь**<br>**кто-нибудь**<br>**что-нибудь**<br>**где-нибудь** |
| **Отрицательное** | **no**<br>**nobody, no one**<br>**nothing**<br>**nowhere** | **никакой**<br>**никто**<br>**ничего**<br>**нигде** |

## Ex.1 translate into English

А1. Он задал мне несколько вопросов. 2. Некоторые люди не любят проводить лето загородом. 3. У тебя есть бумага? – Да, есть немного. 4. Дайте мне, пожалуйста, молока. 5. У некоторых студентов первого курса завтра нет занятий по английскому языку. 6. Хотите чаю? – Нет, спасибо. 7. Он дал нам чернил. 8. Утром мы пили кофе. 9. У вас есть какие-нибудь интересные статьи? 10. Они не дал мне никаких писем. 11. У твоего друга есть книги на английском языке?. 12. Любой студент может ответить на

этот вопрос. 13. Приходите в любое время. 14. Не думаю, что у меня дома есть газеты. 15. У вас есть какие-нибудь карандаши? – Да, есть несколько. 16. Я не вижу чашек и ложек на столе.

Б 1. Двое из ваших детей играют в парке. 2. Некоторые из друзей говорят на двух иностранных языках. 3. Многие из этих инженеров работают а Министерстве внешней торговли. 4. Некоторые из студентов нашего института хорошо играют в футбол. 5. Многие из нас любят музыку. 6. Некоторые из них не работают много над английским языком. 7. Трое из этих мальчиков хорошо катаются на коньках. 8. Кто из вас собирается проводить лето в городе. 9. Некоторые из этих журналов лежат на столе. 10. Дайте мне любую из книг Чехова.

# Topic 24
# Digital Computers

# Reading

## Vocabulary

primary / secondary storage — первичное / вторичное запоминающее устройство

main storage — основная память; оперативное запоминающее устройство

internal storage [in'tanal] — внутреннее ЗУ sequence ['sikwans] — последовательность; порядок следования

intermediate results [,mte'midrat nsAlts] — промежуточные результаты

ongoing process ['ongoing 'prousss] — продолжающиеся), постоянный процесс

similarity [simi'lseriti] — сходство; подобие to retain [п Чет] — сохранять; удерживать to locate [lou'keit] — размещать(ся); располагать(ся) value ['vaeljir.] — значение, величина; значимость, ценность; оценка binary digit ['Ъатэп **'did^it]** — двоичная цифра; двоичный

знак

adjacent [э'йзевэШ] — смежный; соседний; примыкающий

strings of characters — последовательность символов consecutive [ksn'sekjutiv] — последовательный; смежный; соседний medium (pi. media) — носитель; среда capacity — емкость; объем (памяти); пропускная способность

media capacity — емкость носителя

data access time — время доступа к данным

per bit — на единицу информации

to transfer— передавать(ся); переносить(ся); пересы-лать(ся)

archival storage — архивное ЗУ; архивная память to depend — зависеть от; полагаться, рассчитывать на to rotate — вращать(ся); чередовать(ся); сменять(ся) reason — причина; основание; довод; обосновывать;

делать вывод

solid-state device — твердотельный прибор magnetic core — магнитный сердечнir

bipolar semiconductor — биполярный полупроводник

metal-oxide semiconductor (MOS) — структура металл-оксид-полупроводник randomly — произвольно

random-access memory (RAM) — оперативное запоминающее устройство (ОЗУ)

sound recording — звукозапись

to arrange — размещать; располагать; устанавливать;

монтировать tape device — ЗУ на магнитной ленте

to range — классифицировать; располагать в порядке; лежать в диапазоне

magnetic disc storage — ЗУ на магнитном диске

moving-head device — устройство с двигающейся головкой

predominant — преобладающий; доминирующий flexible — гибкий; настраиваемый; изменяемый floppy (disk) — гибкий диск(ета); ЗУ на гибком диске to meet the demands — удовлетворять потребности

pervade [pə:'veɪ d] - распространяться, проникать; пропитывать

innovation [□ɪ no(u)'veɪ ʃ (ə)n] - нововведение

## Read and translate the text.

### STORAGE UNITS

Computer system architecture is organized around the primary storage unit because all data and instructions used by the computer system must pass through primary storage. Our discussion of computer system units will begin with the functions of the primary and secondary storage units. This leads to the examination of the central processing unit and from there to the consideration of the input and output units. Therefore, the sequence in which we'll describe the functional units of a digital computer is: 1) storage units, primary and secondary; 2) central processing unit; 3) input and output units.

As you know, there are primary and secondary storage units. Both contain data and the instructions for processing the data. Data as well as instructions must flow into and out of primary storage.

*Primary storage* is also called main storage or internal storage. The specific functions of internal storage are to hold (store): 1) all data to be processed; 2) intermediate results of processing; 3) final results of processing; 4) all the

instructions required for ongoing process. Another name for primary storage is memory, because of its similarity to a function of the human brain. However, computer storage differs from human memory in important respects. Computer memory must be able to retain very large numbers of symbol combinations, without forgetting or changing any details. It must be able to locate all its contents quickly upon demand. The combinations of characters, that is, the letters, numbers, and special symbols by which we usuallycommunicate, are coded. The codes used by computer designers are based upon a number system that has only two possible values, 0 and 1 .'A number system with only two digits, 0 and I, is called *a binary number system.* Each binary digit is called a bit, from Binary digiT. As the information capacity of a single bit is limited to 2 alternatives, codes used by computer designers are based upon combinations of bits. These combinations are called *binary codes.* The most common binary codes are 8-bit codes because an 8-bit code provides for 2/8, or 256 unique combinations of l's ans O's, and this is more than adequate to represent all of the characters by which we communicate.

Data in the form of coded characters are stored in adjacent storage locations in main memory in two principal ways : 1) as "strings" of characters — in bytes; and 2) within fixed-size "boxes" — in words. A fixed number of consecutive bits that represent a character is called *a byte.* The most common byte size is 8-bit byte. *Words* are usually 1 or more bytes in length.

*Secondary storage.* Primary storage is expensive because each bit is represented by a high-speed device, such as a semiconductor. A million bytes (that is, 8 million bits) is a large amount of primary storage. Often it is necessary to store many millions, sometimes billions, of bytes of data. Therefore slower, less expensive storage units are available for computer systems. These units are called *secondary storage.* Data are stored in them in the same binary codes as in main storage and are made available to main storage as needed.

**Ex.1 Answer the questions**

1. What are the functional units of a digital computer? 2. What units make up the central processing unit? 3. How is computer system organized? 4. What are the two main types of storage units? 5. What do they contain? 6. What is the function of a primary storage? 7. Why is primary storage often called memory? 8. In what respect does computer memory differ from human memory? 9. What are codes based on? 10. What is Secondary storage and what is it used for?

## Ex.2 Find in the text English equivalents

Функциональный блок; цифровой компьютер; устройство ввода; устройство управления; арифметико-логическое устройство; центральный процессор; структура компьютерной системы; первичное запоминающее устройство; вторичное ЗУ; рассмотрение; поэтому последовательность; оперативное ЗУ; внутренняя память; промежуточные результаты; подобие функции человеческого мозга; размешать содержимое по требованию; система счисления; двоичная система счисления; возможные величины; объем информации; двоичный код; смежные ячейки памяти; последовательность символов; быстродействующее устройство; полупроводник; доступный.

## Ex.3 Translate into Russian these word combinations

*Storage:* available storage; buffer storage; computer storage; data storage; magnetic disk storage; magnetic tape storage; input storage; intermediate storage; internal storage; laser storage; main storage; primary storage; secondary storage; sequential-access storage; variable storage; virtual storage.

*Value:* absolute value; acceptable value; additional value; binary value; byte value; character value; constant value; correct value; data value; digit value;

discrete values; invalid value; negative value; numerical value; output value; valid value.

*Digit:* binary digit; binary-coded digit; check digit; information digit; input digit; nonsignificant digit; significant digit; digit-by-digit.

*Sequence:* out of sequence; alphabetic sequence; arithmetic sequence; binary sequence; character sequence; code sequence; instruction sequence;data sequence; digital sequence; historical sequence; increasing sequence; program sequence; string sequence.

**Ex.4 Find in the text words which have similar meaning**

Memory; element; information; command; examination; character; quantity; number; place; computer architect; likeness.

To apply; to form; to move; to hold; to demand; to connect; to supply; to place; to name; to start; to examine.

Continuous; significant; consecutive; usual; enough; main; initial, general.

# Read and translate the text

## DIGITAL COMPUTER OPERATION

1. A digital computer is a machine capable of performing operations on data represented in digital or number form. The individual operations performed by a digital computer are very simple arithmetic or logical processes involving the manipulation of the bits in words or characters of information. The great power of any digital computer rests in the ability to store large volumes of data and to perform these operations at extremely high speed.

In most electronic digital computers the method of number representation is based on the system of binary notation. The binary notation system is most widely used because of the convenience in constructing logical circuits and storage devices capable of handling data in this form. For example, a magnetic memory unit consists of many thousand individual magnetic cells, each of

which can be energized in either of two ways to represent the binary digits 0 or 1. If these cells are grouped to form words or binary coded characters, information can be stored for processing in units of specified size. In the same way, digital data can be recorded as a series of magnetized spots on a magnetic tape or a magnetic disk.

2. The computer has pervaded most fields of human activity and is the most important innovation of our age. Born out of the technology of communication, it is capable of handling enormous amounts of information at tremendous speeds. What makes it so potent is the fact that a single mechanism can perform any information-processing task. The same mechanism can control industrial processes, guide space vehicles or help to teach children. This diversity of tasks is made possible by the simple idea of the stored program.

A program is the enumeration of determining commands. It specifies the method used for the solution of a problem in detail. When the machine is in operation, both the commands and the numbers to be processed are constantly being taken out of and put into a depository of information known as a memory.

It can be seen that the processes performed by a digital computer are essentially simple. These operations can be performed at extremely high speeds and with a high degree of coordination between the different functional units of the hardware system, and this ability means that digital computers can undertake highly complex tasks.

## EX.1 Find English equivalents in the text

Цифровой компьютер, хранить большой объем информации, с высокой скоростью, метод цифрового представления, выполнять операции, бинарное обозначение, состоять из, удобство в построении, магнитная память, магнитная ячейка, питать энергией, накапливать информацию, определенного размера, технологии общения, проникать, цифровая информация, сферы человеческой деятельности, нововведение,

разнообразие задач, перечисление, для решения проблемы, согласование между разными частями, управлять космическими кораблями.

## Ex.2. Answer the questions

1. What does the great power of any digital computer rest in?
2. Is a digital computer a machine capable of performing operations on data represented in number or pictorial form?
3. What system is in most electronic digital computers the method of number representation based on?
4. Why is the binary notation system most widely used?
5. Does the program specify the method used for the solution of a problem in detail or just in general?

## Ex. 3 Make up sentences

1. has pervaded ,The computer, activity, most fields of human.
2. are very simple, The individual operations, computer, arithmetic or logical processes, performed by a digital.
3. consists of many, A magnetic memory unit, thousand individual, magnetic cells.
4. is capable of, A computer, handling enormous amounts, at tremendous speeds, of information.
5. is the enumeration of, A program, determining commands.
6. number representation, The method of, is based on, binary notation, the system of.

## Ex.4 Fill in the gaps

1. The time required for the computer to locate and transfer data in the storage device is called the data time.

   a) sequence; b) access; c) value

2. ____ memories have no moving parts.
   a) electronic; b) mechanical; c) electromechanical
3. Magnetic ___ were the main elements used for pri
   mary memory in digital computers for many years.
   a) cores; b) tapes; c) disks
4. ____ is more commonly used for memory at present.
   a) bipolar semiconductor; b) MOS; c) field-effect transistor
5. Magnetic disks constitute the storage media.
   a) internal; b) primary; c)secondary
6. Data are stored in _ codes in primary as well as in
   secondary storage.
   a) digital; b) binary; c) numerical
7. Data access time is _ in electronic memories than
   that in electromechanical memories.
   a) longer; b) much longer; c) shorter
8. Electronic memories have capacities for data stor-
   age.
   a) more; b) larger;

## Ex. 5 Math the words with their definitions

1. Primary a) one of the performance characteristics of storage measured in binary digits;
2. Secondary b) memory that has random access to the information;
3. Magnetic disc c) combination of units of information;
4. Binary codes d) the main method of secondary stor- age performing both sequential and random storage;
5. RAM e) area of memory where protected pro-

grams can be read from but not written on;

6. Bit — f) a fixed number of consecutive bits representing a character;
7. Byte — g) the principal flexible second storage circuit element;
8. ROM — h) part of memory having lower speed but greater capacity;
9. Floppy — i) a unit of information or binary digit;
10. Capacity — j) the most expensive part of memory having the least capacity and the fastest

**Ex.6 Translate these sentences, mind the meaning of the word *mean***

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

**Ex.7 Translate into Russian**

1. People no longer think of the radio and television as something fantastic. 2. It was necessary to lay cables across the Atlantic Ocean as there was no radio or satellites at that time. 3. Rocket launching, concerts, football and tennis matches can be seen on TV as they occur. 4. As the operation of integrated circuits depends on microscopic components, the purity of all materials at the plant must

be very high. 5. One can see that there is no principal difference between iron and copper as conductors. 6. President T. Jefferson offered his personal library as the basis for the national library. 7. It is difficult for the first-year students to study at the institute as they do not know yet how to organize their work and time. 8. No system of the past was as simple as the metric system. 9. Such metals as iron, cobalt, and nickel are much more magnetic than any other known substances. 10. Cryogenic fuels such as liquid hydrogen are used to cool the aircraft surface. 11. Metallurgists are trying to make composite materials as strong and light as possible. 12. Measures must be taken to keep Moscow air as clean as possible. 13. Engineers
are working at the problem of making computers as small as possible.

## FUNCTIONAL UNITS OF DIGITAL COMPUTERS

As we know, all computer operations can be grouped into five functional categories. The method in which these five functional categories are related to one another represents the functional organization of a digital computer. By studying the functional organization, a broad view of the computer is received.

The five major functional units of a digital computer are:

Input— to insert outside information into the machine;

Storage or memory — to store information and make it available at the appropriate time; 3) Arithmetic-logical unit — to perform the calculations; 4) Output — to remove data from the machine to the outside world and 5) Control unit — to cause all parts of a computer to act as a team.

Figure 5 shows how the five functional units of the computer act together. A complete set of instructions and data are usually fed through the input equipment to the memory where they are stored. Each instruction is then fed to the control unit. The control unit interprets the instructions and issues commands to the other functional units to cause operations to be performed on the data. Arithmetic operations are performed in the arithmetic-logical unit, and the

results are then fed back to the memory Information may be fed from either the arithmetic unit or the memory through the output equipment to the outside world. The five units of the computer must communicate with each other. They can do this by means of a machine language which uses a code composed of combinations of electric pulses. These pulse combinations are usually represented by zeros and ones, where the one may be a pulse and the zero — a no-pulse. Numbers are communicated between one unit and another by means of these one-zero or pulse — no-pulse combinations. The input has the additional job of converting the information fed in by the operator into machine language. In other words, it tran-saltes from our language into the pulse — no-pulse combinations understandable to the computer. The output's additional job is converting the pulse — no-pulse combinations into a form understandable to us, such as a printed report.

Ex.1 Answer the questions

1. What represents the functional organization of a computer?
2. What can we get by studying the functional organization?
3. What is the function of the input device?
4. What does memory serve for?
5. What is the task of the arithmetic-logical unit?
6. What is the function of the output?
7. What is the main purpose of the control unit?
8. How do all units of the computer communicate with each other?
9. What is the additional job of the input?
10. What is the additional function of the output?

**Ex.2 Find English equivalents in the text**

Функциональная организация; действия компьютера; связывать друг с другом; вводить информацию извне; делать информацию доступной; выполнять вычисления; выводить информацию; блок управления;

выдавать команды; заставлять выполнять команды; выходное устройство; внешний мир; связываться друг с другом; комбинация электрических импульсов; холостой импульс; импульсы.

# Grammar

## Причастие (The Participle)

Причастие является неличной формой глагола, которая обладает свойствами глагола, прилагательного и наречия. Подобно прилагательному, причастие может быть определением к существительному или именной частью составного сказуемого:

| | |
|---|---|
| a **broken** cup | **разбитая** чашка |
| a cup was **broken** | чашка была **разбита** |

Подобно наречию, причастие может быть обстоятельством, характеризующим действие, выраженное сказуемым:

**Reading** the text he wrote out new words.

Читая текст, он выписывал новые слова.

Подобно глаголу, причастие имеет видовременные и залоговые формы, может иметь прямое дополнение и определяться наречием. В английском языке существует два вида причастий:

**Participle I** и **Participle II.**

**Participle t** образуется путем прибавления окончания **–ing** к основе глагола:

to speak — speaking, to stop — stopping, to begin — beginning,

to travel — travelling, to drive — driving, to lie — lying.

**Participle II правильных глаголов** образуется путем добавления окончания **-ed** к основе глагола:

to ask — asked, to train — trained.

**Participle II неправильных глаголов** образуется особыми способами; это третья форма неправильных глаголов:

to give — given, to build — built.

Вее другие сложные формы Participle I образуются с помощью вспомогательных глаголов **to be** или **to have** и Participle II смыслового глагола.

**Формы причастий**

| Participles | Active | Passive |
|---|---|---|
| Participle I | developing | being developed |
| Participle П | ---------- | developed |
| Perfect Participle | having developed | having been developed |

**Ex.1 Translate from English into Russian paying attention to participle forms**

1. Studying Newton's work «Principia», a young physicist discovered a mistake in the calculations. 2. Having designed a car radar, the engineers started complex tests. 3. While driving a car one should be very attentive. 4. A new electronic instrument will calculate how far one can drive on the fuel left in the tank. 5. The engine tested showed that it needed no further improvement. 6. Scientists are experimenting with a system allowing drivers to see better after dark. 7. The system being tested will increase the safety and fuel efficiency of a car. 8. Having been tested, the computer system was installed at a plant. 9. Soon the night-vision system designed will be available. 10. The synthetic magnet has a lot of valuable qualities that can be changed, if desired. 11. Recently there have appeared battery-powered cars. 12. The radar used was of a completely new design. 13. Having been heated, the substance changed its properties. 14. Being provided with batteries an electric car can develop a speed of 50 miles an hour. 15. When mass produced, electric cars will help solve ecological problems of big cities. 16. A defect undetected caused an accident. 17. Though first developed for military purposes, radar can be used in modern cars.

**Ex. 2 Translate into Russian paying attention to Participle I, Participle II, Perfect Participle Active and Perfect Participle Passive forms.**

**1.** Electromechanical memories depend upon *moving* mechanical parts for their operation. 2. The time *required* for the computer to locate and transfer data to and from a storage medium is called the access time. 3. *Being* not visible software makes possible the effective operation of computer system. 4. *Having invented* magnetic tapes the Germans used them as the secondary storage medium. 5. *When* properly *programmed* computers don't make computational errors. 6. *Having been introduced* in the early 1960s magnetic disc storage has replaced magnetic tape storage. 7. The control unit *interpreting* instructions is one of the important parts of any computer system. 8. Data *recorded* in the form of *magnetized* dots can be arranged to represent *coded* patterns of bits. 9. *As contrasted* with magnetic tapes magnetic discs can perform both sequential and random processing. 10. *While having* no *moving* mechanical parts electronic memories can transfer data at very high speed.

# Topic 25
# Personal Computers
# Vocabulary

personal computers — персональные компьютеры competitive operating systems — конкурирующая операционная система

IBM (International Business Machine) — фирма по производству компьютеров to enter the fray — ввязаться в драку computer of choice — лучший компьютер to fall by the wayside — остаться в стороне; уступить дорогу

to survive onslaught [sa'vaiv 'onsbt] — выдержать конкуренцию

word size — размер слова; разрядность двоичного слова soft-copy output — вывод электронной, программно-управляемой копии

hard-copy output — вывод «твердой» печатной копии online storage — неавтономное хранение данных в ЗУ offline storage — автономное хранение данных отдельно

от компьютера

input media — носитель для входных данных output media — носитель для выходных данных general -purpose — универсальный; общего назначения stand-alone — автономный to plug in ['p1лд in] — подключать; подсоединять leisure activities ['1езз ak'tivitiz] — досуговая деятельность

word processing — обработка текста

telephone dialing ['tebfoun 'daishn] — набор номера телефона

security [sa'kjuanti] — безопасность; охрана appliance [ap'laians] — устройство; прибор

maintenance ['memtsnansl — поддержание; сохранение; эксплуатация

application software — прикладные программы to delete [di'Iiit] — удалять; стирать; очищать память to move paragraphs around — менять местами абзацы accountant [a'kauntsnt] — бухгалтер accounting [a'kauntirj] — бухгалтерский учет income tax ['тклт 'taeks] — подоходный налог stock market forecasting — биржевые прогнозы worksheet ['wakjlt] — электронная таблица

scheduling ['JedjulirjJ— составление расписания, графика computer-assisted instructions — компьютерные команды to meet the demands — удовлетворять потребности record keeping — регистрация; ведение записей grading ['greidirj] — оценивание; классификация

## PERSONAL COMPUTERS

Personal computers are supposed to appear in the late 1970s. One of the first and most popular personal computers was the Apple II, introduced in 1977 by Apple Computer. During the late 1970s and early 1980s, new models and

competitive operating systems seemed to appear daily. Then, in 1981, IBM entered the fray with its first personal computer, known as the IBM PC. The IBM PC quickly became the personal computer of choice, and most other personal computer manufacturers fell by the way-side. One of the few companies to survive IBM's onslaught was Apple Computer, which is sure to remain a major player in the personal computer marketplace. In less than a decade the microcomputer has been transformed from a calculator and hobbyist's toy into a personal computer for almost everyone.

What is a personal computer? How can this device be characterized?

—First, a personal computer being microprocessor-based, its central processing unit, called a microprocessor unit, or MPU, is concentrated on a single silicon chip.

—Second, a PC has a memory and word size that are smaller than those of minicomputers and large computers. Typical word sizes are 8 or 16 bits, and main memories range in size from 16 K to 512 K.

—Third, a personal computer uses smaller, less expensive, and less powerful input, output and storage components than do large computer systems. Most often, input is by means of a keyboard, soft-copy output being displayed on a cathode-ray tube screen. Hard-copy output is produced on a low-speed character printer.

—A PC employs floppy disks as the principal online and offline storage devices and also as input and output media.

—Finally, a PC is a general-purpose, stand-alone system that can begin to work when plugged in and be moved from place to place.

Probably the most distinguishing feature of a personal computer is that it is used by an individual, usually in an interactive mode. Regardless of the purpose for which it is used, either for leisure activities in the home or for business applications in the office, we can consider it to be a personal computer.

**Ex. 1Find English equivalents in the text**

Конкурирующая операционная система; появляться ежедневно; ввязаться в драку; лучший компьютер; остаться в стороне; выдержать конкуренцию; главный поставщик на компьютерном рынке; игрушка для любителя; микропроцессорный; цельный кристалл (микросхема) из кремния; размер слова; компоненты меньшей мощности; посредством; вывести на экран; низкоскоростной принтер с посимвольной печатью; использовать гибкие диски; приборы (не) автономного хранения данных; универсальный; автономная система; отличительная черта; интерактивный режим; независимо от цели; досуговая деятельность.

**Ex. 2 Answer the questions**

1. When did the first personal computer appear?
2. What was one of the first PC model?
3. What is a personal computer?
4. What are the four main characteristics of a PC?
5. What does the term microprocessor-based" mean?
6. What are the typical word sizes of a PC?
7. How is input carried out in personal computers?
8. What principle storage devices do PC use?
9. What kind of a system is a PC?
10. What differs personal computers from large computer systems?

**Ex. 3 Translate into Russian these A*) conjunctionless (бессоюзные); B) coordinating (с сочинительной связью) sentences. Remember these coordinating conjunctions: and, but, or, while, both ... and, as well as, not only... but also, either... or, neither... nor.***

A) 1. The computer you told me about was constructed at a Russian plant. 2 We hope we'll buy the computer your friend spoke so much about 3. This is the principle the electronic computer is based upon. 4. The teacher says we

may ask any questions we like. 5. Elements integrated circuits are made of are electrically interconnected components. 6. The main tendencies of 1C development scientists are working at are to increase the scale ofintegration and to improve reliability. 7. — Where are the computer games I gave you yesterday? — The computer games you are asking about are on the top shelf. 8. He was one of the greatest scientists the world had ever known.

B) 1. These devices can perform *both* the input *and* output functions. 2. Data are recorded on magnetic discs and tapes *either* by outputting the data from primary storage *or* by using a data recorder. 3. *Neither*-the programmer *nor* tha analyst could explain the cause of the computer errors. 4. Data *as well as* instructions must flow into and out of primary storage. 5. This grammar exercise is *not only* too long *but also* very difficult. 6. Printers may be *either* impact ornonimpact. 7. Character printers are used with all microcomputers *as well as* on computers of all sizes. 8. *Both* primary *and* secondary storage contain data and the instructions for processing the data. 9. The CPU functional units can be in one of two states: *either* "on" or"ofF\ 10. High-speed devices are *both* input *and* output devices that are used as secondary storage.

## APPLICATION OF PERSONAL COMPUTERS

Personal computers have a lot of applications, however, there are some major categories of applications: home and hobby, word processing, professional, educational, small business and engineering and scientific.

*Home and hobby.* Personal computers enjoy great popularity among experimenters and hobbyists. They are an exciting hobby. All hobbyists need not be engineers or programmers. There are many games that use the full capabilities of a computer to provide many hours of exciting leisure-time adventure.

The list of other home and hobby applications of PCs is almost endless, including: checking account management, budgeting, personal finance, planning,

investment analyses, telephone answering and dialing, home security, home environment and climate control, appliance control, calendar management, maintenance of address and mailing lists and what not.

*Word processing.* At home or at work, applications software, called a word processing program, enables you to correct or modify any document in any manner you wish before printing it. Using the CRT monitor as a display screen, you are able to view what you have typed to correct mistakes in spelling or grammar, add or delete sentences, move paragraphs around, and replace words. The letter or document can be stored on a diskette for future use.

*Professional.* The category of professional includes persons making extensive use of word processing, whose occupations are particularly suited to the desk-top use of PCs. Examples of other occupations are accountants, financial advisors, stock brokers, tax consultants, lawyers, architects, engineers, educators and all levels of managers. Applications programs that are popular with persons in these occupations include accounting, income tax preparation, statistical analysis, graphics, stock market forecasting and computer modeling. The electronic worksheet is, by far, the computer modeling program most widely used by professionals. It can be used for scheduling, planning, and the examination of "what if situations.

*Educational.* Personal computers are having and will continue to have a profound influence upon the classroom, affecting both the learner and the teacher. Microcomputers are making their way into classrooms to an ever-increasing extent, giving impetus to the design of programmed learning materials that can meet the demands of student and teacher.

Two important types of uses for personal computers in education are computer-managed instruction (CMI), and computer-assisted instruction (CAI). CMI software is used to assist the instructor in the management of all classroom-related activities, such as record keeping, work assignments, testing, and grading.

Applications of CAI include mathematics, reading, typing, computer literacy, programming languages, and simulations of real-world situations

**Ex.1 Find English equivalents in the text**

Много областей применения; тем не менее; обработка текстов; пользоваться популярностью; любители; способности компьютера; бесконечный перечень; анализ инвестиций; набор номера телефона; автоответчик; ведение календаря, хранение адресов и почты; и так далее; прикладные программы; исправлять ошибки в написании; стирать предложения; переставлять абзацы; бухгалтер; биржевые брокеры; консультант по налогам; юристы; работники образования; управленцы; бухгалтерский учет; подоходный налог; компьютерное моделирование; электронные таблицы; составление расписания; оказывать огромное влияние; прокладывать путь; дать толчок; удовлетворять потребности; учебная деятельность; компьютерная грамотность; моделирование реально-жизненных ситуаций.

**Ex.2 Answer the questions to the text**

What are the main spheres of PC application? 2. Do you enjoy computer games? 3. Is it necessary for a person to be an analyst or a programmer to play computer games? 4. What other home and hobby applications, except computer games, can you name? 5. What is "a word processing program"? 6. What possibilities can it give you? 7. Can you correct mistakes while typing any material and how? 8. What other changes in the typed text can you make using a display? 9. Which professions are in great need of computers? 10. How can computers be used in education?

## Ex.3 Make up sentences

1. among, Personal, great popularity experimenters, computers, and hobbyists, enjoy.

2. All hobbyists need not be engineers or programmers.

3. applications software, called a word processing program, enables you to correct or modify any document in any manner you wish before printing it.

4. and the examination of, The electronic worksheet, for scheduling, planning, "what if situations, can be used.

5. are having, Personal computers, a profound, upon the classroom, influence.

6. their way into, are making, classrooms to an ever-increasing extent, Microcomputers.

**7.** the microcomputer has been transformed, In less than a decade, from a calculator and hobbyist's toy, into a personal computer for almost everyone.

**Ex.4 Translate into Russian**

It should be said that according to estimates the production of materials in space is to bring 60 billion dollars by 2030. 2. The best way to study before the exam is by changing one's activity every 30 minutes. 3. The first self-propelled vehicle in Russia was made by Kulibin in the 18-th century. 4. Driving a new Japanese car a driver will find his way even in Sahara by switching over to a navigation Earth satellite. 5. By 1960 the number of cars in the world has reached 60 million. 6. A driver may avoid collisions on the road by using a radar system. 7. Newton's great work «Principia» was published by Halley, the famous astronomer, who paid his own money for it. 8. The cosmonauts were told to increase their daily exercises by 30 minutes.

Ex5. Fill in the gaps

Personal computer is small …….based on a microprocessor and designed to be used by one person at a time

a) digital computer, b) vacuum tube, c) software

digital computer is a computer that represents information by……

a) electricity, b) pictures, c)numerical (binary) digits)

microprocessor is an integrated circuit ……..that performs the bulk of the processing and controls the parts of a system

semiconductor chip, d) keyboard, c) memory

PC board is ……for a personal computer; fits into a slot in the mother board

a) a display, d)a removable circuit board, c) a flowchart

desktop computer is a personal computer small enough to fit conveniently in …….

a) a picture, b) a hand c)an individual workspace

portable computer is a personal computer that can easily be

a) carried by hand, b) washed, c) carried by truck

**Ex.6 Read the text and fill in the gaps with the words from the box**

| Connected, the Internet the physical parts, tasks, for individuals . |
|---|

A personal computer (PC) is a general-purpose computer, whose size, capabilities and original sale price makes it useful……. Software applications for most personal computers include, but are not limited to, word processing, spreadsheets, databases, Web browsers and e-mail clients, digital media playback, games and myriad personal productivity and special-purpose software applications. Modern personal computers often have connections to……, allowing access to the World Wide Web and a wide range of other resources. Personal computers may be ……to a local area network (LAN), either by a cable or a wireless connection. A personal computer may be a desktop computer or a laptop, Netbook, tablet or a handheld PC (Palmtop).

Hardware is a comprehensive term for all of …….of a computer, as distinguished from the data it contains or operates on, and the software that provides instructions for the hardware to accomplish…….

# Grammar

## Функции причастия в предложении.

## Основные способы перевода

Причастие выполняет две функции в предложении — определения и обстоятельства.1. Причастие в функции **определения** может занимать место перед определяемым существительным или после него. В этом случае Participle I обычно переводится на русский язык причастием действительного залога настоящего или прошедшего времени, оканчивающимся на *-ущий, ющий, -ащий,* ***'Ящий, 'вший:***

The **waiting** man is in the library. **Ожидающий** человек — в библиотеке.

The man **waiting** for you has come from Moscow. Человек, **ожидающий** вас, приехал из Москвы.

The man **waiting** for you asked for your telephone number. Человек, **ждавший** вас, спрашивал ваш номер телефона.

Сложная форма Participle I пассивного залога в функции определения (после существительного) может переводиться также придаточным определительным предложением:

The house **being built** in this street now will be a new library. Дом, **который строится (строящийся)** сейчас на этой улице, будет новой библиотекой.

Participle II в функции определения (перед или после существительного) переводится на русский язык страдательным причастием настоящего или прошедшего времени, оканчивающимся на *-емый, -имый, -нный,* или придаточным определительным предложением:

The **discussed** problems are in teresting. - **Обсуждаемые** проблемы интересны.

The problems **discussed** at the conference are interesting. Проблемы, **обсуждаемые (которые обсуждаются)** на конференции, интересны.

The problems **discussed** at the last conference were interestingб Проблемы, **обсужденные (которые обсуждались)** на последней конференции, были интересны.

They spoke of the problems discussed. Они говорили об **обсуждаемых** проблемах.

2. Причастие в функции **обстоятельства** обычно стоит в самом начале предложения, т. е. предшествует подлежащему, или следует за группой сказуемого. В этом случае причастие может выполнять функцию обстоятельства времени, причины, условия и т.д. В этой функции причастию могут предшествовать союзы **when, while, if, unless, once, though** и т.д. Причастие (с союзом или без него) переводится на русский язык или полным придаточным предложением времени, причины, условия, или деепричастием, оканчивающимся на -я, -в, или существительным с предлогом *при:*

While **reading** this book I met many new facts. **Читая (при чтении)** эту книгу, я встретил много новых фактов.

**Crossing** the street first look to the left. **Переходя** улицу, посмотрите сначала налево.

When **crossing** the street, first look to the left. **Когда переходите (при переходе)** улицу, посмотрите сначала налево.

**Being heated** magnetised materials lose their magnetism. **Если нагревать (при нагреве)** намагниченные материалы, они размагничиваются.

**Having finished** the test he put down the results. **Закончив испытание,** он записал результаты.

When (if) **insulated,** the wire may be used as a conductor. **Когда (если) провод изолирован (при изоляции),** его можно использовать в качестве проводника.

The motor gets overheated, unless **cooled.** Мотор перегревается, **если его не охлаждать**

## Сопоставление перевода причастий в функции определения и обстоятельства

| Participle I | Participle II |
|---|---|
| *В функции определения*<br>A lot of students from **developing** countries (из развивающихся стран) study in this country.<br>An electric car **developing** the speed of 50 km/h (развивающий скорость 50 км/ч) is being designed.<br>The device being **developed** (разрабатываемый, который разрабатывается) will be tested at the plant. | *В функции определения*<br>Some American countries get help from **developed** countries (из развитых стран).<br>The mechanism **developed** in our laboratory (разработанный в нашей лаборатории) is mass-produced.<br>The method **developed** (разработанный метод) provided good results |
| *В функции обстоятельства*<br>(While, when) **developing** (Разрабатывая, Когда Белл разрабатывал) transmitter for deaf people Bell invented the telephone.<br>**Being developed** (Когда будет разработан), a new supercomputer will be very powerful. | *В функции обстоятельства*<br>(When, if) **developed** (Когда (если) будут разработаны. При удачной разработке) successfully, space platforms may be very useful for national economy. |

**Ex.1 Translate into Russian**

1.The first engines appeared in the 17th century and people began using them to operate factories, irrigate land, supply water to towns, etc. 2. The steam engine having been invented, a self-propelled vehicle was built. 3. The supply of steam in the car lasting only 15 minutes, the vehicle had to stop every 100 yards to make more steam. 4. After the German engineer N. Otto had invented the gasoline engine, the application of this engine in motor cars began in many countries. 5. The cars at that time were very small, the engine being placed under the seat. 6. Motorists had to carry a supply of fuel, because there were no service stations. 7. Brakes having become more efficient, cars achieved greater

reliability. 8. Cars with internal combustion engines having appeared, the automobile industry began to develop rapidly. 9. By 1960 the number of cars in the world had reached 60 million, no other industry having ever developed so quickly.

**Ex.2 Translate into Russian**

1. She sat smiling. 2. The work begun by him is very important. 3. The corrected texts were on the table. 4. The man sitting at the window made an interesting report yesterday. 5. When (while) seeing the film, I remembered my childhood. 6 Being late for the talks, they left before the party was over. 7. Not knowing the grammar rules, he made many mistakes. 8. I (have) read several books translated into Russian by this author. 9. Feeling bad he decided to stay at home. 10. Every time (he was) in Kiev, he went to see his friend. 11. Some stamps collected by him are very curious. 12. Being proud of his father, he often speaks about him. 13. When speaking at the meeting, I forgot to mention this fact. 14.What is the name of the man speaking on the phone now? 15. At last she the man who saved her son. 16. Some questions touched upon in the report are worth careful consideration. 17. They adopted a boy who lost his parents in an aircraft-crash.

**Ex. 3 Translate into Russian**

1. Having arrived two days before the opening of the conference, they had enough time to go sightseeing. 2. Having knocked twice and not having received an answer, they decided that there was nobody in. 3. Having read Petrov's report attentively, I came across a few mistakes in it. 4. Having come t the hotel, she made herself comfortable in the room and suddenly found a telegram awaiting her (waiting her). 5. I felt very tired, having worked the whole day in the sun. 6. Having been kept without water for a long time, the flowers faded. 7. Not having found the necessary book at home, he went to the library. 8. Having opened the door noiselessly, he waited for a while and tiptoed into the room. 9. Having dropped the coin on the floor, he did not try look for it in the darkness and took another one. 10.

# Supplementary reading

## Cyberterrorism

Development of scientific progress related to introduction of modern information technologies led to appearance of new kinds of crimes as illegal infringement with operation of computers, systems and networks, theft, appropriation, extortion of computer information. This socially dangerous phenomenon received a wide-known name - "computer crime" and "cyberterrorism". Computer crime, by mechanism, methods of committing and concealing, possesses characteristic features of high latency and low level of solving.

Computer crimes are any illegal actions at which the computer acts or as object against which the crime is done or as a tool that is used for fulfilment of criminal acts.

There are three major classes of criminal activity with computers:

*1. un*authorized use of a computer, which might involve stealing a username and password, or might involve accessing the victim's computer via the Internet through a backdoor operated by a Trojan Horse program.

2.creating or releasing a malicious computer program (e.g., computer virus, worm, Trojan Horse).

1. harassment and stalking in cyberspace.

World practice shows, that the damage from computer crimes can be stimated in the sums making annual budgets of large cities. In the majority of the countries of Europe and America the computer criminality gives incomes, comparable with the incomes received from a drug trafficking and the weapon.

The British government has calculated how much costs the economy cybercrime. It is estimated by the British Government, that the amount of damage from computer crime is 43 billion dollars a year - about 2% of the proceeds of economic production of the country. Thus, conclude in the UK,

criminals still get a huge profit at the expense of state funds and private business. Therefore, computer crimes are directly related, to the criminal as well as to the economic crimes.

Unfortunately, only 12% of total number of cybercrimes become known and reach law enforcement and public. Well, what bank, for instance, will be interested to announce that their payment systems were hacked? The given problem has several more important aspects: weak training of law enforcement officers to investigate such crimes, computer criminals do not leave any common traces. These crimes usually are transnational, trans-frontier, when a criminal being located in one state commits a crime against the other state. National level criminalization of such activities is important for investigation of cybercrimes and prosecution of guilty. When criminal law of any of these states do not provide responsibility for such activities, this state becomes a legal vault for criminals.

A computer crime is an extremely versatile and intricate phenomenon. By objects of such criminal offences could be either hardware (computers and peripheral units) as the material objects, or computer software and databases, for which the hardware is the surrounding. Thereby, a computer can serve either as an object or as a tool of transgression.

All the attempts to suppress the computer crime have been inexpedient until 1st January 1997, when the new Criminal Code of the Russian Federation (RF CC) was enforced. In spite of explicit public threat, such encroachments were not illegal, i.e. they did not fall under criminal jurisdiction.

The situation has changed after 24 May 1996, when the State Duma of the Russian Federation adopted the Russian Federation Criminal Code.

The structure of the computer crimes (i.e. the list of elements featuring a socially harmful action as a certain crime) is stated in Chapter 28 of the Criminal Code, which is headed 'Crimes in a computer information sphere'. This Chapter comprises three articles: 'Unauthorized access to a computer information'

(Article 272), 'Creation, use and spread of detrimental computer programs' (Article 273) and 'Infringement of operating rules of a computer, a computer system, or a computer network' (Article 274).

In conclusion I would like to acknowledge some of the main directions of development of legislation to fight computer crimes.

1. We need to ensure that the legal regulation of the spread of mass media, posting on Internet sites, including, ensuring implementation of the constitutional ban on propaganda or agitation instigating social, racial, ethnic and religious strife, the proliferation of pornographic and other information, as well as secure the obligation of public authorities to protect official information available on their websites.

2. Improving the criminal procedure law shall establish conditions to law enforcement authorities promptly and effectively in cases of threats to the security implemented by using information and communication technologies, uniform issue of evidence obtained through computer systems and telecommunications.

3. Legislation in the field of communication also requires improvement in several respects. It should ensure that:

• Disclosure of the competent authorities of sufficient data on the flow of information to identify service providers and routes of transmission of information

• Online service provider for communication of information about the subscribers (type and time of services rendered, the user's identity, address, phone number, payment details and other information) are not associated with the content they transmit information.

• We should make new articles of the Criminal Code relating to different types of computer crimes and punishments for them. We must take into consideration the experience of foreign countries, for example, we can apply the methods of punishment of crimes used in the Criminal Code of Portugal.

4. There is a necessity of removing the legal uncertainty regarding the use of employers of visual observation, means of control of telephone calls, emails, use of Internet access, since these funds can be used for illegal activities.

5. There should be no anonymity in certain areas of the Internet, because it involves a lot of negative consequences, and its borders will have to be objectively narrowed.

6. Also, the objective problem is the newness of the scope of legal regulation, the lack of an established theoretical framework for the development of legislation. In particular, it is not 48 defined legal content of the basic concepts. Because knowledge is the cornerstone for a beginning that should be given properly to IT professionals in order to enable them to block all malicious intrusions, and to provide safe protection.

# Topic26
# Modern Computer Usage

## Vocabulary

input-output information – информация ввода-вывода
complex numbers – сложные цифры
under control – под контролем
modern computers - современные компьютеры
separate devices - отдельные механизмы
personal computer - персональный компьютер
software – программное обеспечение
hardware - аппаратные средства

# Modern Computer Usage

Unfortunately, to restore the first electronic digital machines for the demonstration of their work is practically impossible. However with the aid of modern computers it is possible to show the operation of the separate devices. One of such demonstration complexes was created on the base of plotter “EC-7051M” and the personal computer, which works in the medium Dos. In the 1980 years this plotter was the device for input-output information in the computers of United System and worked under control of the special block. In the computer collection of Polytechnic Museum we have this block. In the correspondence with the comprised technical task the student of Moscow Institute Electronics and Mathematics had developed the schematic of joining this plotter with the personal computer, and then he assembled a new control unite on the basis of contemporary technological base. He wrote programs of control in the algorithmic language C++ and demonstration programs, which made it possible to derive the images selected by user from the library. The first algorithmic language was FORTRAN (1955 year), and it’s graphic application was language GRAFOR, created for fulfilling the graphic works at the end of 1960 years in the Institute of Applied Mathematics named after M.V. Keldysh.

In the exposition of the Electronic Digital Machines hall visitors of any categories can see the input-output of information from the computer and its fixation in the from of the drawings, different diagrams, graphs and labels on the paper with the aid of the plotter ES-7051. In the 70 years in Central Research Institute of Experimental Dwelling Projects the graphic mapping program ALGRAF was created. It made possible to automate designing of architectural and

town-building objects. This program made it possible to present the work of an

architect during the presence of the planning solutions of rooms and the work of an artist-designer during the reach for the versions of complex forms and curved surfaces. Any visitor can perceive itself a little in their role.

Also in the exposition the dynamic stand of logic elements “Logical functions on the semiconductors” works under the control of the personal computer. Executed at the factory of museum in the 1960 years, it was no longer subject to restoration. Now it is easy to explain during the excursions with its aid, as can be realized the basic logical functions on the basis of the use of semiconductors in the second generation computers. Now for any categories of visitors it is possible to demonstrate with PC the following slide-shows. Also with the aid of the contemporary multimedia computer it is possible to hear out the computer music.

The work according to digitization of video films was done. The first 5 films are already enumerated: “Academician Lebedev”, “Machine geometry and graphics”, “Carved surface in automatization system” and others. This work is planned to be continued.

It is wonderfully to demonstrate the connection of nature, mathematics, computer technology and arts with the aid of the fractal drawing. Fantastic patterns, FRAKTALS, carried out not possessing imagination computer, following the mathematical and artistic intention of the doctor of technical sciences, the chief researcher of Institute Information Transfer of Russian Science Academy Peter Nicolayev. The Computer seemingly sends point into the journey through the complex plane in accordance with some specific roles of the fulfillment of the operation on the complex numbers and obtains the whimsical band of ornament, which exist to the infinite depth. Among the variety of locks, spirals and eddies every time before us it is opened the picture of amazing beauty and appear many time the reduced copies of primordial Mandelbrot set.

In XXI century artistic software finds ever wider acceptance. During May 2002 year in Moscow the festival of media-art is passed “Software as the kind of art or artistic games with software”. It was oriented to the skill, adequate to information society, to the activity, artistically and theoretically interpreting new reality, which can be enumerated. With the aid of modern multimedia PC it is possible to look over the work of participants in this festival, which demonstrated deep properties and qualities of programming. These works are executed with the use of contemporary, but most usual, i.e., widespread software. The Programmer-artist, who creates or who uses software “differently”, is capable, at least to the period, to conquer commerce and to introduce skill into the sphere, in which its presence is not primordial provided. This usage of a computer with its multimedia possibilities makes it possible substantially to supplement and to expand the set of the themes, connected with the computer technology history without any limitations.

## Ex. 1 Match the phrases with the translation

| | |
|---|---|
| 1. В прошлом году мы проводили работу, согласно цифровым видеофильмам…. | 1. Also with the aid of the contemporary multimedia computer…… |
| 2. Сейчас тоже некоторые sofrtware… категории посетителей … | 2.In XXI century artistic |
| 3. К сожалению, восстановление первой электронной вычислительной машины… | 3. Too now for any category of visitors it is possible to.. |
| 4.Теперь, с помощью свременных мультимедийных компьютеров…. | 4. Too now for many category of visitors it is possible to.. |

| | |
|---|---|
| 5. Первый язык алгоритма… | 5.In last year we began to conduct work according to digitization of video…. |
| 6. В течение мая 2002 года в Москве на фестивале медиа-исскуства… | 6.The first 5 films are already enumerated…. |
| 7. С помощью современных мультимедийных компью-теров…. | 7.The first algorithmic language… |
| 8. В XXI веке компьютерное искусство… | 8. Unfortunately, to restore the first electronic digital machine… |
| 9.Первые 5 фильмов уже записаны… | 9.All works are executed with the use of contemporary… |

## Ex.2 Find in the text sentences with the following word combinations

electronic digital machines

separate devices

input-output of information

a personal computer

logic elements

a contemporary multimedia computer

to expand the set of the themes

## Ex.3 Finish up the sentences

It was oriented to skill, adequate to information society….

….capable, at least to the period…

He had written programs of control in the ….

… and the personal computer, which works in the medium DOS

… and it's graphic application was language GRAFOR …

…a new control unit on the basic contemporary technological base.

Now it is easy to explain during the excursion…

…of functioning of the rape perforator "ПЛ-150" …

In the beginning 70 years in Central Research …

Among the variety of locks, spirals…

## Ex. 4 Agree or disagree

1. It is wonderfully to demonstrate the connection of nature, music, history, mathematics, computer technology and arts with the aid of the fractal drawings.
2. The 6 films are already enumerated, for example, "Academician Stepanov".
3. In XXI century mathematical software finds ever wider acceptance.
4. During May 2003 year in Moscow the festival of media-arts passed "Software as the kind of or artistic games with software".
5. In the 1955 years this plotter was me device for input-output information in the computers.
6. The second algorithmic language was FORTRAN.
7. Of course, in the explosion of the Electronic Digital Machines hall for the visitors of any categories we show the input-output of information from computer.
8. Any visitor can perceive itself in their role.

## Ex.5 Make up sentences

1. The graphic mapping program ALGRAF, designing of architectural and town-building objects, made it possible to automate.
2. of the fractal drawing, It is wonderfully to demonstrate the connection, of nature and computer technology with the aid.
3. to restore the first, It is practically impossible, electronic digital machines

4. In the exposition visitors, the input-output of information from the computer, of any categories can see.

5. language, FORTRAN, the, was, year, first, 1955, algorithmic.

## Ex. 6 Make these sentences interrogative and negative

1. Any visitor can perceive itself a little in their role.

2. In 1960 it was no longer subject to research.

3. In last year we began to conduct work according to digitization of video films.

4. The 5 films are already enumerated.

5. In XXI century artistic software finds ever wider acceptance.

6. It is wonderfully to demonstrate the connection of nature, mathematics, computer technology and arts with the aid of the fraktal drawing.

7. To restore the first electronic digital machines for the demonstration of their work is practically impossible.

8. In the computer collection of Polytechnic Museum we haven't this block.

9. Also in the exposition the dynamic stand of logic elements "Logical functions on the semiconductors" works under control of the personal computer.

## Ex. 7 Translate from Russian into English

1. В зале экспозиции электронных вычислительных машин мы демонстрируем посетителям информацию о вводе-выводе компьютерной системы.

2. С помощью современного мультимедийного компьютера возможно прослушать компьютерную музыку.

3. С помощью современных компьютеров стало возможным продемонстрировать действие отдельных механизмов.

4. Первым языком алгоритма был «фортрэн».

# Supplementary Reading

***Computer Usage in this modern age***

Living in the 21st century certainly has some perks and benefits. I am very much enjoying a phone in my pocket that I can use to dial up family and friends, send SMS or email messages, post and read tweets, and browse the web. As much as I hate doing it, I am occasionally thankful for the built in GPS and Google Maps navigation. I have a V8 sports car which I choose to use to rip-up the country side, and even in today's gas market I can still do 28 miles to the gallon. And occasionally when hunting for twisty roads, I can get turned around. I am not too much of a man, that I will not stop and ask for directions, but it is nice to not have to.

However I am not lucky enough, to not have to work. I am a Computer Scientist / Software Engineer. When I am on the clock (whether physically in the office or dialed in remotely) I am usually dialed into at least 3 different machines of over 3 dozen all of which are located around the planet. People call me to solve their problems, and I nearly always make them happy. In the rare occasion, that I can not make the customer happy, I can explain why I can not do it and often direct them to the team member or team members who are better suited to solve their problem.

When I go home, I try not to look at a g-d damn computer. Especially after spending 8-14 hours staring at an idiot box, occasionally working with idiots, the last thing I want to do when I go home is to spend another 2-6 hours staring at a computer. For this reason I do not consider myself a video gamer, and especially not a PC gamer. Also as I work on my laptop, the one PC I do not want to look at, if i can help it, is my work computer. For this reason I purchased for myself a nicely sized netbook, which I upgraded with an SSD. This very capable and charming computer travels well and allows me a

near full sized keyboard which allows me type easily, but it is a little long in the tooth at about 3 years old.

This past birthday by best friend surprised me with a 7inch Samsung wifi tablet, which has been just glorious. The software has been a little flaky but whatever issues I have had with it, are recuperated with the small size, large battery life, and extreme portability. I now take this with me everywhere. It goes with me to work, and allows me to keep my personal life off of my work PC. I can also take this with me when I am out driving, as I can pull into nearly any coffee shop or eatery and login to check my email, send a tweet, or surf the web, on a more capable screen than my phone.

So really when I boil it down, at home I am really set with my netbook and tablet… but then again I am not, as neither of these have a CD or DVD drive, neither of them have more than a 200GB HDD, and while I can code on the netbook, it lacks the full size keyboard which I really need to be comfortable. What I need is a desktop or server of some sort, and yes while I have had such machines in the past, the last time I bought one was in 1998, and that system often just sat in the corner of the room until that rainy day when I needed to copy or burn something. Like I said when I am at home I try to stay off of the computer. I could go buy an Alienware laptop or similar, but really I would use it and have it around for approximately 6% of the time when I might need it's horsepower. For the financial outlay I would make, I would rather book a cabin with a hot tub in the Smokey Mountains for a week.

What I have decided I need is a semi-portable box, which can house components from a desktop PC, have an included monitor, and keyboard. In this way I can keep it in a corner or in a closet, until I need it. I will not need a seperate corner of my house with a dedicated computer desk, and a dedicated computer chair. But where to find such a system, for less than the price of a ultra modern laptop…

# Grammer

## Предлог (The Preposition)

**Предлоги** — это служебные слова, которые указывают на связь существительных (или местоимений) с другими словами в предложении. Например:

We met **at** the door **of** my house. Мы встретились у двери **моего дома** (род. над.).

По своей форме предлоги делятся на простые, сложные и составные. К простым предлогам относятся большей частью односложные предлоги, такие, как **in, on, at, by, to, with, from**

и т.д. Сложные предлоги образуются путем сочетания двух слов: **inside** *внутри,* **outside** *снаружи,* **throughout** *через,* **upon** *на,* **into** *в,* **out of** *из* и т.д.

Составные предлоги — это предлоги, представляющие в основном сочетание существительного, прилагательного, причастия или наречия с простыми предлогами или союзами: **by means of** ***с помощью, посредством;*** **because of** ***из-за;*** **within** ***внутри, в;*** **instead of** ***вместо;*** **during** ***в течение;*** **in spite of** ***несмотря*** *на;* **in front of** *перед;* **in accordance with** *в соответствии* ***с, согласно чему-либо;*** **thanks to** ***благодаря;*** **owing to** ***благодаря;*** **according to** *в соответствии, по словам* и т.д. У большинства предлогов есть свои конкретные значения, например: **from** ***от, из;*** **under** ***под;*** **above** ***над;*** **after** ***после;*** **before** ***перед, до;*** **about** *о, около;* **on** *в, на;* **through** *через;* **towards** ***к;*** **round** *вокруг;* **without** *без* и т.д. У некоторых предлогов **(of, by, for, with** и др.) значения конкретизируются только в контексте, например:

Here's a letter **for** you. Вот письмо **для** тебя.

She's been here **for** two weeks. Она находится здесь в **течение** двух недель.

How much do they pay **for** the work? Сколько они платят за работу?

They went out **for** a walk. Они пошли на прогулку.

There is a man waiting **for** you. **Тебя** ждет какой-то человек. Хотя предлоги обычно ставятся перед существительными, в английском языке есть несколько конструкций, в которых предлог отделяется от того существительного, к которому он относится. Это происходит в следующих случаях:

1) в специальных вопросах:

**What** are you looking **at?** На что ты смотришь?

**What** is this article **about?** О **чем** эта статья?

2) в придаточных предложениях:

I don't know **what problems** *Я* не знаю, **с каких проблем** they are going to begin **with.** они собираются начать. 3) в пассивных конструкциях:

The laboratory assistant was sent **for.** За лаборантом послали.

**Ex. 1 Fill in the gaps: in, *at, on, to, into, under, near.***

We live ... Moscow. 2.1 get up ... seven o'clock and leave ... eight. 3.1 usually walk ... the institute. 4. There are three rooms ... our flat. 5. There is a picture ... the wall and a small table ... the picture. 6. He comes ... the room and sits down ... the chair ... the table. 7. ... the evening we watch TV or read books. 8. We do not study... Sunday. 9. There are several newspapers ... the table. 10. The accident happened ... the bridge.

## Ex.2 Read and write: in, on, at or to.

George is 35 years old. He is an engineer. Every day he gets up early …….. the morning. Then, he has a shower and goes ……. work. He arrives …….the office …….. o'clock. George comes back home ……. 5 o'clock. ……afternoon he has dinner with his family. …….Tuesdays and Thursdays George takes his son, Ben, to the gym. ……the weekends, George and his family go …….their country house.

It's great!

**Ex. 3 Fill in the gaps**: *to, with, about, at, for, on, in.*

This morning father spoke ... my brother and me ... going to see our aunt this evening. It is our aunt's birthday. We wanted to surprise her family. Our mother was going to go ... us. We had to be ready... seven o'clock. We wanted to be ... our aunt's house ... seven thirty. We left... my aunt's house... seven... our mother and

father. But the aunt was not ... home. Her children had taken her and the uncle... the theater. We laughed: we had a surprise party, but it was on us. We left the presents and went... a show ourselves. We went... Kuskovo yesterday. I went... my mother and father. We took our lunch ... us. We reached Kuskovo ... noon. Fathe rwent ... a parking station, but it was full. He went to another and then ... another. Every parking station was crowded. Father drove for a while. ... one o'clock he found a place ... a car.... two o'clock our friends came, we sat down ... grass and ate our lunch. We didn't see much because too many people were there ... Kuskovo. Next time we have a day to spend we shall go ... some other place.

# Topic27

# Modem

Some new words

equipment - снаряжение; снабжение; оборудование

cash - наличные деньги

upload- (comput) загру|жать, -зить (coll also выкладывать, выложить) на другой (удалённый) компьютер

share - делить, разделять

disable-делать неспособным; лишать возможности; делать нетрудоспособным

occur - иметь место, случаться

## A MODEM

The piece of equipment that allows a computer to communicate with other computers over telephone lines is called a modem. The modem allows the individual to access information from all over the world and use that information in everyday life. Connecting with banks, Automatic Teller Machines, cash registers to read credit cards, access travel agents, buy products, e-mail, access databases, and teleconferencing, the modems provide easy access to many services. Files can be transferred easily, by uploading to another machine, or downloading to your own machine within a matter of minutes. The computer modem can be used as a telephone answering system, and documents can be faxed from one computer to another assuring fast and easy access to important documents.

A modem takes computer information and changes it into a signal that can be sent over telephone lines. The modem is a bridge between digital and analog signals. The computer is of the digital type, and the telephone using analog technology. The modem converts the "0"s and "l"s of the computer (off-on switches) into an analog signals modulating the frequency of the electronic wave or signal. The modem does just the opposite and demodulate the signal back into digital code. The modem gets its name from MOdulate and the DEModulate.

Most people believe that you need a separate phone line for a modem, but that is not true. Your modem and telephone can share one line, the problem arises when someone else needs to use the telephone while the modem is in use. Also disable call waiting, it could disrupt your modem connection while the modem is in use.

There are three kinds of modems — internal, external, and fax. All modems do the same thing, they allow computers to communicate through telephone lines. This lets computers exchange information everywhere. *Internal Modem* is a circuit board that plugs into one of the expansion slots of the computer.

Internal modems usually are cheaper than external modems, but when problems occur, fixing and troubleshooting the modem can sometimes prove to be quite difficult. *External Modem* attaches to the back of the computer by way of a cable that plugs into the modem port. It is usually less expensive and very portable. It can be used with other computers very easily by unplugging it and plugging it into another computer. Fax *Modem* can be hooked up to your telephone and used to send information to your computer. Your computer can also send information to a fax machine. Most computer modems are modems with faxing capabilities.

**Ex.3 Fill in the gaps**

| a device, information, signals, frequency, classified by . |
|---|

A modem (modulator-demodulator) is …… that modulates an analog carrier signal to encode digital information and demodulates the signal to decode the transmitted…… The goal is to produce a signal that can be transmitted easily and decoded to reproduce the original digital data. Modems can be used with any means of transmitting analog……, from light emitting diodes to radio. The most familiar type is a voice band modem that turns the digital data of a computer into modulated electrical signals in the voice …… range of a telephone channel. These signals can be transmitted over telephone lines and demodulated by another modem at the receiver side to recover the digital data.

Modems are generally…… the amount of data they can send in a given unit of time, usually expressed in bits per second

## Ex.4 Find non-finite verb forms

*A.a) Gerund; b) Present Participle Active; c) Present Participle Passive; d) Past Participle Passive; e) Perfect Participle Active; f) Perfect Participle Passive.*

1. When keyed the data are held in a small memory called buffer. 2. Data keyed into the memory of a computer by typing on a keyboard are readable by humans. 3. Keyboard enables inputting numerical and text data. 4. The mouse provides the cursor control simplifying user's orientation on the display. 5. Having been constructed recently a new electronic device has important applications in space exploration. 6. Being supplied with a special appliance a television set may have a remote control. 7. The control unit operates by reading one instruction at a time. 8. Improved methods of obtaining three-dimensional television pictures have been worked on the basis of holography.

*B.a) Indefinite Infinitive Active; b) Indefinite Infinitive Ibssive;*
*c) Continuous Infinitive Active; d) Perfect Infinitive Active;*
*e) Perfect Infinitive Passive.*

1. Input devices are used to enter data into primary storage.
2. These data appeared to have been investigated long ago.
3. Scientists are glad to have obtained such valuable results.
4. You should have known wonderful features of computers long ago.
5. The problem to be solved is of great importance to the development of this branch of industry.
6.The first amplifying semiconductor devices (transistors) are known to have been developed in the USA in 1948.
7.He ordered these devices to be repaired as soon as possible.

**Ex. 5 Fill in the gaps**

1. A personal computer is a small relatively inexpensive device designed for an individual …….

a) person; b) producer; c) user

2. One of the first and most popular personal computer was…….. in 1977.

a) interpreted; b) introduced; c) integrated

3. All personal computers are based on…….technology, its CPU being called MPU.

a) microscopy; b) microprocessor; c) microelement

4. Very soon a microcomputer was……from a calculator into a PC for everyone.

a) transformed; b) transferred; c) transported

5. Input in PC is usually performed by means of a……..

a) mouse; b) scanner; c) keyboard

6. A personal computer uses…..disks as input and output media.

a) hard; b) fixed; c) floppy

_____

7. Personal computers have a great....upon pupils, educators, accountants, stock brokers and who not.

a) influence; b) information; c) environment

8. A word processing program called application……enables you to modify any document in a manner you wish.

a) hardware; b) software; c) firmware

9. Using a display you can…..mistakes, words and replace sentences.

a) delete; b) dial; c) correct

## Ex.6 Circle the correct sentence, a or b.

A Hi. I'm Susanna.

B Hi. I Susanna.

A Hello. What's your name?

B What your name?

A Where he's from?

B Where's he from?

A They isn't English.

B They aren't English.

A She is Spanish. Her name's Ana.

B She is Spanish. His name’s Ana.

A We are Italian. Your surname is Tozzi.

B We are Italian. Our Surname is Tozzi.

A What are this?

B What are these?

A It’s an umbrella.

B It’s a umbrella.

A They are watchs.

B They are watches.

**Ex.7 Make up sentences**

1. the individual, The modem allows, to access information, from all over the world.
2. The computer modem, a telephone answering system, can be used as.
3. is a bridge between, The modem, digital and analog signals.
4. Your modem, share one line, and telephone can.
5. Internal modems usually, modems, are cheaper than external.
6. to the back of, *Modem* attaches, the computer by way of a cable.

# What Is Cable Modem?

You can connect to the Internet in several ways. As far as high speed Internet connections go, there are DSL and cable connections. A modem is used to connect computers or a network of computers to the Internet via a cable line. Function. The modem is connected to a router or directly to a computer via an Ethernet cable. Data travels through the cable connection to the modem and to the Ethernet connection.

Data traveling downstream uses about the same amount of bandwidth of one cable television channel. Since a cable connection can handle hundreds of channels, providers can use multiple channels to deliver high amounts of data.

Data going upstream (uploads) uses less bandwidth. A cable modem is required because a cable line cannot be connected directly to a computer. Most computers have an Ethernet network card that can connect to external modems.

Benefits. Cable modems offer access to connections faster than DSL and dial-up Internet. Cable modems routinely offer connection speeds of 4 to 16 megabytes of data per second with upload speeds going over 768 kilobytes per second. Compared with DSL even the slowest cable connection is almost four times as fast.Cable modems are also "always on" in that they do not require the user to dial out to get a connection. As long as the modem is turned on and the cable provider's service is functional, the computer can connect instantly.

Size. The physical size of a cable modem is about the size of a small book. They are often less than 6 inches in height and 1 or 2 inches in width. This makes them ideal for placing them in a variety of places, including directly on the desktop. Older modem models may be larger. The cable modem has at least one port for Ethernet out connections and one port for cable in. A wireless router or wired router can be connected to the Ethernet out connection. This is how multiple computers can use one modem.

Time Frame. Cable Internet download speeds can vary based on file size, bandwidth used and the number of users currently connected. For example a 4MB song file will take between 23 to 43 seconds to download. Service providers offer faster connections that may reduce that time to five seconds or less.

# Grammar

**Модальные глаголы (The Modal Verbs)**

Модальные глаголы выражают не само действие или состояние, а отношение к ним со стороны говорящего. С помощью модальных глаголов можно показать, что действие возможно или невозможно, обязательно или не нужно, вероятно или неправдоподобно, желательно и т.д. Модальными являютсяглаголы **can, may, must, ought, should, would, need.**

Особенностью модальных глаголов является то, что они:

1) не имеют полного самостоятельного значения и употребляются в сочетании с инфинитивом смыслового глагола (без частицы to);

2) не имеют инфинитива, причастия, герундия;

3) не имеют окончания -s в 3-м лице единственного числа настоящего времени;

4) не имеют формы прошедшего времени, кроме **can** и **may (could, might),** и будущего времени;

5) образуют вопросительную и отрицательную формы без вспомогательного глагола **to do:**

May I take your dictionary? He cannot drive a car.

Рассмотрим примеры употребления модальных глаголов.

**Can**

Глагол **can** имеет значение *мочь, обладать физической или умственной способностью:* **can** (настоящее время) *могу, может, можем* и т.д.; **could** (прошедшее время) *мог, могла, могло* и т.д. Например:

Even a child **can** lift it. Даже ребенок может поднять это (это легко сделать).

**Can** you speak English? Вы можете говорить по-английски?

Сочетание **to be able** *быть в состоянии* с последующим инфинитивом с частицей **to** является эквивалентом глагола **сап** и восполняет его недостающие формы:

We shall **be able to do** it only tomorrow. Мы сможем сделать это только завтра.

**May**

Глагол **may** имеет значения разрешения и возможности: **may** (настоящее время) *могу, может, можем* и т.д.; **might** (прошедшее время) *мог, могли* и т.д. Например:

**May** I come in? Можно мне войти?

He **may** be at home. Он, может быть, дома

Сочетания **to be allowed** и **to be permitted** с последующим инфинитивом с частицей **to** являются эквивалентом глагола **may** и восполняют его недостающие формы в значении *мочь, иметь разрешение:*

He **was allowed to** come in. Ему разрешили войти.

**Must**

Глагол **must** выражает необходимость, моральную обязанность и соответствует в русском языке словам *должен, нужно, надо.* Глагол **must** имеет только одну форму настоящего времени:

You **must** do it yourself. Вы должны это сделать.

Наряду с глаголом **must** и взамен его недостающих форм употребляются его эквиваленты **to have** (должен в силу обстоятельств) и **to** be (должен в силу запланированности, намеченности действия), а следующий за ними инфинитив имеет частицу **to:**

It was raining heavily and we **had to stay** at home. Шел сильный дождь, и мы должны были остаться дома.

He **is to take** his exam in June. Он должен сдавать этот экзамен в июне.

**Ought**

Глагол **ought** выражает моральный долг, желательность действия, относящиеся к настоящему и будущему времени. На русский язык **ought** переводится словами *следовало бы, следует, должен.* После **ought** инфинитив всегда употребляется с частицей **to:**

You **ought to** see a doctor. Тебе следовало бы обратиться к врачу.

**Should**

Глагол **should** в качестве модального глагола выражает обязанность,желательность действия, совет, рекомендацию. На русский язык **should** переводится как *следует, должен, обязан:*

You **should** know about it. Вам следует знать об этом.

**Would**

Глагол **would** в качестве модального глагола может выражать:

а) обычные и повторяющиеся действия в прошлом (в этом значении он является синонимом выражению **used to):**

**He would** spend hours in the Tretyakov Gallery. Он обычно проводил многие часы в Третьяковской галерее.

He **used to** spend hours in the Tretyakov Gallery. Он любил проводить многие часы в Третьяковской галерее.

б) упорное нежелание выполнить какое-то действие:

I asked him to do it but he **wouldn't.** *Я* попросил его сделать это, но он ни за что не хотел.

в) присущее свойство, характеристику (часто встречается в технической литературе):

Paper **would** bun. Бумага хорошо горит.

**Need**

**Need** может употребляться как модальный глагол и как правильный глагол. Как модальный глагол **need** имеет только одну форму. Он в основном употребляется в отрицательных предложениях

You **needn't** come here today  Тебе не нужно приходить сюда сегодня.

**Ex.1 Read and translate the dialogues, paying attention to modal verbs.**

A: You can do without lots of things.

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

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

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

A: Can you write without a pen?

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

A: I must have a new dictionary.

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

A: I want to see Mr. Z.

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

A:But perhaps he may be.

B:No, sir. He may not be back for some time.

A:I can wait.

B:He may not be in until twelve.

A:I can wait until he is in.

B:He may be out all day.

A: May I go to the cinema?

B: No, not today, tomorrow.

A: May not I go today? Zed can't come tomorrow. May I go home with Zed afterwards?

B: Oh, no, you mustn't do that.

A: Why, mustn't I?

B: Because you mustn't be home late.

A: Well, then, may Zed come home with me?

B: Yes, he may do that.

A: May I have the money, please.

B: Oh, very well.

**Ex2. Substitute modal verbs with suitable equivalents.**

1. Students must take exams in January. 2. She can speak French well. 3. You may take this book till tomorrow. 4. We must learn new words every week. 5.1 live not far from my work. I can go by bus or I can walk. 6. You may come in. 7. We can take this book from the library. 8. She cannot do this work in time. 9. He must go to St. Petersburg for a few days. 10. We can see electrical devices everywhere.

**Ex.3 Make these sentences interrogative and negative.**

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

**Ex.4 Translate into Russian.**

1. Everyone should know a foreign language. 2. To make supercomputers, we need highly developed electronics and new materials. 3. One should do one's work in time. 4. The students ought to know the history of their institute. 5. The development of new materials does not mean that old materials should lose their significance. 6. Marie Curie needed a laboratory and equipment for her research. 7. Every institute ought to be proud of their famous graduates. 8. One should know that «roentgen» is a unit (единица) of radiation.

**Ex. 5 Put *would* where necessary instead of *used to,* translate into Russian.**

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

**Ex. 6 Read, choose and write.**

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

**Ex. 7 Translate into English.**

1. Он может читать и писать по-английски. 2. Она должна сделать эту работу в конце месяца. 3. Теперь студенты могут войти в аудиторию. 4. Она может заниматься здесь. 5. Он должен прочитать эту статью. 6. Можно мне взять ваш учебник? 7. Я должен пойти в библиотеку и взять книги. 8. Можно войти?

**Ex.8 Translate into English**

1. Разрешите мне помочь вам. 2. Давайте начнем работать сегодня. 3. Пусть Николай расскажет им о своем институте. 4. разрешите мне задать вам несколько вопросов. 5. Пусть они занимаются в 6 аудитории. 6.

Давайте навестим Петра. Его сегодня не было в институте. 7. Пусть он сдает экзамены. 8. Разрешите мне прийти на вашу лекцию по литературе. 9. Давайте вместе выполним 15-е упражнение. 10. Пусть она немножко позагорает. Мы можем подождать ее. 11. Разрешите мне пойти к врачу. 12. Пусть они посмотрят сегодня телевизионную программу в 10 часов. 13. Пусть ваши товарищи ответят на ваши вопросы. 14. Разрешите мне пригласить вас пообедать с нами. 15. Давайте поговорим об этом завтра, хорошо? 16. Пусть она поработает с компьютером. 17. Давайте поедем туда вместе. 18. Давайте покажем им новые районы нашего города.

**English-Russian Dictionary**

abacus — счеты

ability — способность, возможность

abolish — отменять, исключать

acceptable — приемлемый

access —доступ, обращение; обращаться, иметь доступ

~ time — время доступа

database ~ доступ к базе данных

sequential ~ последовательный доступ accessible — доступный accessories — реквизиты

accessory equipment — вспомогательные устройства accomplish — завершать, заканчивать accomplishment — завершение; выполнение

according — соответствующий

~ to — в соответствии с

accordingly — соответственно, соответствующим образом account — расчет, подсчет, счет (банковский); учитывать, подсчитывать

take into ~ принимать во внимание, учитывать accumulate — накапливать (ся), суммировать, собирать accumulator — сумматор; накапливающий регистр; устройство

суммирования

accuracy — точность; правильность; четкость accurate —
точный, правильный achieve — достигать, завершать
achievement — достижение, завершение acquire —
приобретать, получать acquirement — приобретение,
получение act — действовать, работать action — действие,
работа, операция
put into - приводить в действие activity —
деятельность
adapt — адаптировать(ся); настраивать(ся); приспосабливаться)
adapter — адаптер add — сложение, суммирование adjacent ■—
смежный; соседний; примыкающий adjust — регулировать;
настраивать adjuster — регулятор
adjustment — регулировка; настройка; корректировка; подгонка; поправка
advance — продвигаться(ся); in - заранее
advanced — улучшенный; усовершенствованный; (более) эффективный
advancement — продвижение; улучшение; усовершенствование
advantage — преимущество; выгода
advice — совет; рекомендация
advise — советовать; рекомендовать; консультировать
adviser — консультант; справочник
affect — влиять; воздействовать
agree — соответствовать; согласовывать (ся)
agreement — соглашение
aid — помощь; содействие
aids — средства; приспособления
aim — цель; нацеливать, направлять
algorithm — алгоритм
align — выравнивать, выстраивать в линию
allocate — распределять; размещать; предоставлять (доступ)

allocation — распределение; назначение; предоставление

allow — допускать; позволять

- for — учитывать; принимать во внимание

allowable — допустимый

alter — (из)менять(ся) alteration — изменение; перемена amend — исправлять; улучшать amendment — поправка; исправление appropriate — подходящий; соответствующий; свойственный;

присущий

arclitect — разработчик архитектуры architecture — архитектура; структура

communications - архитектура средств связи

computer - архитектура компьютера

disk - структура диска

instruction set - структура системы команд

network - сетевая архитектура

security ~ архитектура системы зашиты

software ~ структура программного обеспечения arrange — размещать; располагать; устанавливать; монтировать

- icons — выстроить значки

arrangement— размещение; расположение; упорядочение; устройство

B

background — фон; предпосылка, основа; подготовка; квалификация;

навыки (работы)

bar — стержень; полоса; строка

base — база; основа; основание; data ~ база данных

information - совокупность информации knowledge ~ база

знаний user ~ круг пользователей

based — основанный

batch — пакет; пакетный файл

- processing — пакетная обработка

bit — бит; двоичный разряд

board — панель; пульт; плата chip - плата с микросхемами circuit - монтажная плата key - клавиатура switch - панель переключения

bootstrapping — начальная загрузка

branch — ветвь; раздел; отделение; разветвляться; переходить

break — разрыв; прерывание; пауза; прерывать; нарушать (работу); отказывать (о программе)

- **into** внедряться, проникать (в систему)

breakdown — разрушение; поломка brief— краткий; сжатый in * кратко; вкратце bring — (пре)доставлять; давать

- into — вводить; заносить в память

~ **into action** — приводить в действие

- **out** — показывать; демонстрировать

browse — просматривать

browsing — просмотр

buffer — буфер; заносить в буфер

bug — ошибка; дефект; недоработка

data ~ ошибка в данных

**loop** - ошибка в цикле

security - недоработка системы защиты **bug-free** — не содержащий ошибок bug-test — проверять на наличие ошибок builder — разработчик; изготовитель; создатель building — разработка; построение; формирование; создание burden — издержки; затраты; обязанности; **bus** — шина; канал; линия (передачи данных); соединять шиной

control - шина управления

data - шина данных

**input** ~ входная шина

**input-output** - шина ввода-вывода

memory - шина (доступа) к памяти button — кнопка;

кнопочный browse - кнопка просмотра

## C

**cache** — кэш; файл для хранения (данных); хранить; сохранять **calculate** — вычислять; рассчитывать

**calculating device** — вычислительное устройство **calibrate** — градуировать; выверять; настраивать **call** — вызов; обращение; вызывать; обращаться; называть **call for** — требовать; предусматривать **cancel** — отменять; аннулировать; отмена; аннулирование **capability** — способность; возможность **capacitor** — конденсатор

**capacity** — емкость; объем; производительность;

**capture** — собирать (данные); переносить; записывать (в память)

**card** — плата; карта; карточка

**cardfile** — картотека

**carrier** — носитель; держатель; сеть передачи данных

**carry** — нести; переносить

**- out** — выполнять (команду)

**cartridge** — кассета; картридж

**cathode-ray tube** —электроннолучевая трубка

**cause** — заставлять; вынуждать; быть причиной; причина; основание

**cell** — ячейка; элемент

**chain** — цепь; цепочка; последовательность

**challenge** — трудность; препятствие; представлять трудность

**change** — изменение; замена; изменять(ся); сменять(ся)

**character** — символ; знак; буква ~ **шар** — таблица символов

**chart** — диаграмма; график; схема; таблица;
строить график; изображать **choose** — выбирать
**circuit** — цепь; контур; электрическая схема **circuitry** —
(электронные) схемы
**clear** — чистый; стертый; удаленный; очищать; стирать; удалять **code** —
код; кодировать; программировать; система команд **coding** —
программирование **column** — столбец; колонка; графа **communicate** —
сообщать(ся); связывать **communication** — связь; сообщение;
взаимодействие **comparative** — сравнительный **compare** — сравнение;
сравнивать; соотноситься **comparer / comparator** — компаратор;
устройство сравнения **compatibility** — совместимость **compiler** —
компилятор
**complete** — полный; целый; завершенный; завершать; заканчивать
**completely** — полностью; целиком **computation** — вычисление;
расчет **compute** — вычислять; рассчитывать **computer** —
компьютер; вычислительная машина

**advanced** - современный компьютер
**all-purpose** ~ универсальный компьютер
**analog** ~ аналоговый компьютер
**digital** - цифровой компьютер
**first-generation** - компьютер первого поколения
**general-purpose** - универсальный компьютер
**handheld** - карманный компьютер
**IBM- compatible** ~ ИБМ-совместимый компьютер
**mobile** - портативный / переносной компьютер
**notebook** - блокнотный компьютер
**personal ~ [PC]** персональный компьютер
**portable** ~ портативный компьютер

~ **mail** — электронная почта **concept** — понятие; принцип; концепция **condition** — условие; состояние; режим **confirm** — подтверждать **confirmation** — подтверждение considerably — значительно consume — потреблять; расходовать consumer — потребитель; абонент consumption — потребление; расход

power ~ расход энергии content — содержание; смысл

contrast — контраст; противоположность

as -ed with — в отличие

in - напротив; наоборот

contribute — содействовать; способствовать; вносить вклад contribution — вклад; содействие control — управление; регулирование; управлять; регулировать

access - управление доступом

device - управление устройством

distance - дистанционное управление

error - контроль за ошибками

inventory - инвентаризация; переучет

- panel — панель управления

~ unit — блок управления convenience — удобство; пригодность convenient — удобный; пригодный conversion — преобразование convert — преобразовывать converter — преобразователь; конвертор convey — передавать; сообщать conveying — передача (информации) copy — копия; экземпляр; копировать core — ядро; оперативная память; суть; основная часть correct — верный; правильный; нужный; требуемый; исправлять correction — исправление; устранение (неисправности); коррекция

corrective — корректирующий

corrector — корректор; блок или программа корректирования

corrupt — разрушать; портить; искажать; искаженный

corrupted — искаженный; запорченный

corruption — разрушение; искажение; порча; повреждение

data - искажение данных

**D**

damage — повреждение; разрушение data — данные; информация

application - данные прикладной программы

approximate ~ приближенные данные

available - имеющиеся данные

bad - неверные (искаженные) данные

calculation — расчетные данные

check - контрольные данные

help ~ справочные данные

missing - недостающие (отсутствующие) данные

source ~ исходные данные database — база данных; заносить в базу данных deal — иметь дело; работать dealer — посредник; поставщик debug — отлаживать (программу) debugger — отладчик debugging — отладка; наладка decide — решать; принимать решение decision — решение decode — декодировать decoder — дешифратор

decrease — уменьшение; снижение; уменьшать; снижать default — по умолчанию; подразумеваемый; умолчание; стандартный параметр

deficiency — недостаток; нехватка; отсутствие delay — задержка; запаздывание; задерживать; откладывать

delete — удалять; стирать; очищать

deleter — программа удаления

deletion — удаление; стирание

delivery — подача; доставка; поставка

demagnetize — размагничивать

demand — требование; запрос; требовать; запрашивать

density — плотность

data ~ плотность записи данных

drive - плотность дисковода

packing - плотность упаковки

storage - плотность заполнения памяти depend — зависеть от (чего-либо) dependence — зависимость dependent — зависимый; зависящий depending — в зависимости от deposit — помещать; размещать depository — склад; хранилище design — проектирование; конструирование; разработка; построение detail — деталь; подробность

in ~ подробно; детально detect — обнаруживать; выявлять detection — обнаружение; выявление

error - выявление ошибок

failure - обнаружение неисправностей; выявление ошибок detector — детектор; средство обнаружения; датчик device — устройство; прибор; аппарат; приспособление

accounting - счетное устройство

alarm - сигнальное устройство

clock * датчик времени; таймер

computing - вычислительное устройство; способ вычислений

control - устройство управления

download — загружать; считывать; считывание (файлов) с сервера drive — привод; дисковод; запоминающее устройство

disk - дисковод

magnetic-tape - запоминающее устройство на магнитной лейте driver — драйвер; двигатель

print - драйвер печати

software ~ программный драйвер due to — благодаря; из-за; вследствие

dump — разгрузка; дамп; вывод; разгружать сбрасывать; выводить

duplication — дублирование; копирование duplicator — копировальное устройство

**E**

edit — редактировать;

editor — редактор; программа редактирования

effect — действовать; оказывать воздействие; влияние; эффект

efficiency — эффективность; коэффициент полезного действия

effort — усилия; работа

eject — выбрасывать; выталкивать; выдавать (данные); выброс; выдача

elaborate — разрабатывать; развивать elaboration — развитие; разработка eliminable — устранимый

eliminate — устранять; удалять; отменять; ликвидировать equal — равный; одинаковый

equality — равенство

equation — уравнение;

equip — оборудовать; оснащать

equipment — оборудование; приборы; аппаратура; (аппаратные) средства

erase — стирать; удалять erasing — стирание; удаление; очистка error — ошибка; погрешностьevent — событие; случай; исход

examination — исследование; рассмотрение; просмотр; проверка

examine — исследовать; проверять

except for — за исключением

exchange — обмен; замена

execute — выполнять; исполнять

execution — выполнение; исполнение

executive — диспетчер; управляющая программа; операционная система

exit — выход; выходить

expand — расширять(ся); увеличивать; наращивать (возможности)

expansion — расширение; увеличение;

experience — опыт; квалификация; испытывать (трудности)

exponentiation — возводить в степень

extend — расширять; удлинять

extension — расширение; дополнение; удлинение; продление

extract — выделять; извлекать

extraction — извлечение; выборка; выделение

extremely — чрезвычайно; крайне; очень

F

fabricate — изготовлять

fabrication — изготовление

facility — устройство; средство; удобство

facilities — оборудование; приспособления; возможности не удаваться

failure — отказ; повреждение; дефект; сбой; ошибка; неудача

fault — неисправность; дефект; отказ; сбой; давать сбой; отказывать

assembly ~ дефект сборки data - ошибка в данных

design - проектная недоработка device ~ неисправность

устройства latent - скрытый дефект random -

случайный сбой /ошибка

feasibility — возможность; осуществимость; выполнимость

feasible — возможный; выполнимый; осуществимый'

feature — свойство; признак; особенность; характерная черта

feed — подавать; питать; заправлять (бумагу); вводить (данные)

feedback — обратная связь

field — поле; область; зона; сфера (деятельности)

figure — цифра; число; вычислять;

figure out — вычислять; определять

file — файл; заносить в файл batch ~ пакетный файл
common ~ общий файл data - файл / картотека данных
help ~ файл подсказок input ~ входной файл output ~
выходной файл user - файл пользователя - recovery —
восстановление файла
firmware — встроенное программное обеспечение
flexibility — гибкость; адаптируемость; настраиваемость; изменяемость
flexible — гибкий; адаптируемый; настраиваемый; изменяемый
floppy — гибкий диск; дискета
flow — ход выполнения (программы); последовательность; проходить

frequency — частота
fulfill — выполнять; осуществлять; завершать
fulfillment — выполнение; осуществление; завершение
fundamental — основной; существенный; фундаментальный;
furnish — поставлять; снабжать

## G

gadget — приспособление; вспомогательное устройство
gain — достигать; извлекать пользу; выигрывать; выгода; усиление
gather — собирать(ся)
general — общий; универсальный;
generate — генерировать; создавать; производить
generation — создание; формирование; образование; поколение
give back — возвращаться
give out — выдавать; предоставлять
give up — отказывать (об устройстве); не справляться; отказываться
grade — степень; ранг; класс; сорт; упорядочивать; размещать по рангу
grading — классификация; упорядочивание; выравнивание grapher —
самописец graphic(al) — графический

- plotting tables — графические планшеты graphics — графика

groundwork — основа; основание *I*

guard — защита; защищать; предохранять guidance — управление; наведение (на цель); руководство guide — руководство; инструкция; справочник

**H**

habit — навык; привычка; свойство

computing ~s —навыки работы с компьютером

handling —обработка; управление; регулирование data - работа с данными fault / error - обработка ошибок

hand-operated — управляемый вручную

hand-printed — машинописный

hang (up) — «зависать»; блокировать

hardware — аппаратура; оборудование; аппаратное обеспечение /средства by - аппаратными средствами computer - аппаратное обеспечение компьютера device - аппаратная часть устройства display - аппаратные средства вывода на экран expansion ~ дополнительное аппаратное обеспечение support ~ вспомогательное аппаратное обеспечение

harm — вред; ущерб; повреждение

harmful — вредный

harmless — безвредный (о вирусе)

heading — заголовок

healthy — исправный; работоспособный (о системе); незапорчен-ный

help — подсказка; справка; помощь

hereafter — далее; в дальнейшем

hereby — таким образом; тем самым

hierarchy — иерархия

high-capacity — большой емкости

high-density — с высокой плотностью

high-fidelity (Hi-fi) — с высокой точностью воспроизведения

high-frequency — высокочастотный

I

icon —условный символ; пиктограмма; изображать условно

identifier —идентификатор; имя; обозначение

identify — идентифицировать; распознавать; выявлять (ошибку)

ignorance — незнание

ignorant — несведущий; не знающий

imbed — встраивать; внедрять; включать

immunity — невосприимчивость; нечувствительность

implement — выполнять; осуществлять

implementation — реализация; осуществление; разработка; внедрение

implementor — конструктор; разработчик

improper — непригодный; недопустимый; неправильный; неподходящий

improve — улучшать; уточнять (данные)

improvement — улучшение; усовершенствование; уточнение (данных)

inaccurate — неточный; ошибочный

inadequate — несоответствующий; непригодный; неприемлемый

incapable — неспособный

include — включать; содержать

incompatible — несовместимый

inconsiderable — незначительный

incorporate — включать; содержать; встраивать; внедрять

increase — увеличивать; возрастать; увеличение; повышение

independent — независимый

inferior — низший; худший (по качеству)

influence — влияние; воздействие; влиять; воздействовать

interprete — интерпретировать; истолковывать

interpreter — интерпретатор; переводчик

interrupt — прерывание; прерываться

intricate — сложный; запутанный

invade — вторгаться; проникать

invalid — неверный; недопустимый; недействительный; необоснованный

**J**

jack — гнездо

jam — заедание; заклинивание

job — работа; задание; работать

join — соединение; соединять

joystick — джойстик (рычажковое устройство)

junction — соединение; стык

justification — выравнивание (данных); обоснование; доказательство

justify — выравнивать; обосновывать; доказывать; оправдывать

К

key — клавиша; кнопка; переключатель

break - клавиша прерывания

control <Ctri> - управляющая клавиша

delete - клавиша удаления

end ~ клавиша перехода в конец

enter ~ клавиша ввода

erase - клавиша удаления

escape - клавиша выхода

home - клавиша перехода в начало

insert - клавиша вставки

page-down - клавиша листания вперед

page up ~ клавиша листания назад

pause ~ клавиша остановы (паузы)

reset - кнопка сброса

shift - клавиша переключения регистров keyboard — клавиатура; клавишный kind — вид; разновидность

know-bow — технология; методика; знания; приемы; *жарг.* ноу-хау

knowledge — знания; осведомленность

be common - быть общеизвестным

programming - знания в области программирования

## L

lack — отсутствие; недостаток lagging — отставание; запаздывание language — язык

all-purpose / general-purpose * универсальный язык

artificial - искусственный язык assembler - язык ассемблера

business-oriented - язык для (программирования) экономических задач compiler - язык компилятора data ~ информационный язык database - язык для работы с базой данных

high-level - язык высокого уровня low-level - язык низкого уровня

modelling / simulation - язык моделирования programming / development ~ язык программирования launch — запускать (программу); вводить в действие

layout — размещение; распределение lead [led] — свинец

learn-on-Iine — обучаться с помощью компьютера

letter — буква; символ

level — уровень; выравнивать access ~ уровень доступа

**data** ~ информационный уровень

device - уровень устройств error - уровень ошибки

hardware - аппаратный уровень

input ~ уровень входного сигнала output ~ выходной уровень

performance - степень быстродействия

presentation ~ уровень представления

protection / security - уровень / степень защиты

software - программный уровень

transmission - уровень передаваемого сигнала

lifetime — срок службы **1ше** — строка; линия; шина; канал

link — связь; соединение; связывать; соединять

list — список; перечень; таблица

M

magnetize — намагничивать

mail — (электронная) почта

main — главный; основной

maintain — поддерживать; сохранять; эксплуатировать

malfunction — сбой; отказ; неисправность; отказывать; давать сбой

manage — управлять; организовывать

management — управление; регулирование; организация data - работа с данными database ~ управление базой данных error - управление обработкой ошибок software ~ разработка и сопровождение программного обеспечения task - управление ходом выполнения задач

manipulate — управлять; манипулировать; обрабатывать

manipulation — управление; работа; обработка; преобразование

manipulator — блок обработки

manual — руководство; справочник; инструкция; описание help - справочное руководство operation - руководство по эксплуатации

manufacture — изготовлять; производить; разрабатывать manufacturer — изготовитель; производитель; разработчик mark — признак; метка; знак; помечать; обозначать measurement — измерение; размер

medium *(pi* media) — среда; носитель; средство; способ; средний data - носитель данных

input ~ носитель для входных данных; способ ввода (данных) output - носитель для выходных данных; способ вывода portable / removable - съемный носитель

meet — удовлетворять (условию); отвечать; соответствовать ~ the demands /requirements — удовлетворять нужды, потребности

memory — память; запоминающее устройство additional - добавочная память core - оперативная память extended - дополнительная память external - внешняя память high-capacity - память большой емкости internal ~ внутренняя память main ~ основная память

random-access - (RAM) — оперативное запоминающее устройство (ОЗУ)

read-only - (ROM) — постоянное запоминающее устройство (ПЗУ)

secondary ~ вторичная память

merge — слияние; объединение; сливать(ся); объединять(ся)

message — сообщение; запрос; посылать сообщение

meter — измерительный прибор; датчик; счетчик

metering — измерение

mode — способ; метод; режим

free-running - режим свободного доступа operating ~ рабочий режим

programming - режим программирования read-only - режим доступа к данным без возможности их изменения

N

need —потребность; необходимость; требовать(ся); быть необходимым

**network** — сеть; схема; контур

- **drive** — сетевой накопитель noncomparable — несравнимый **noncompatible** — несовместимый **noncomputable** —

невычисляемый noncontrollable —неуправляемый notation —
запись; представление; обозначение
binary ~ двоичная система notepad — блокнот
**number** — число; количество; цифра numeric —
числовой; цифровой **numerous** — многочисленный

**O**

objective — цель; целевая функция; требование
observation — наблюдение; отслеживание
observe — наблюдать; следить; соблюдать (правила)
obtain — получать; достигать
occur — происходить; случаться
on-board — расположенный на плате; встроенный; бортовой
ongoing — продолжающийся; постоянный; непрерывный
on-line — неавтономный; подключенный к компьютеру
onset — начало; ввод в действие
open — открывать; начинать; размыкать outline — контур; очертание;
схема; план; краткое изложение
out-of-order — неисправный
output — вывод; выход; устройство вывода; выводить
bard-copy - распечатка; данные, выведенные на печать
soft-copy ~ данные, выведенные на экран

P

package — пакет; блок; модуль
application - прикладной пакет
data ~ пакет данных
packaged software — готовое программное обеспечение password —
пароль pattern — шаблон; образец; форма
- recognition — распознавание образов
pen — перо

graphic / light - световое перо

perform — выполнять; осуществлять; работать; действовать performance — (рабочая) характеристика; производительность; быстродействие; режим работы

application - скорость работы прикладной программы

computer - быстродействие компьютера

device ~ скорость работы устройства

error - скорость исправления ошибок

execution ~ скорость выполнения (программы)

memory - скорость доступа к памяти; скорость выборки

network - пропускная способность processor — быстродействие процессора pointer — указатель; стрелка

potent — могущественный; мощный; убедительный power — мощность; энергия; питание

- supply — источник питания

predefined symbols — заранее заданные символы

predict — предсказывать; прогнозировать

predominant — преобладающий

predominate — преобладать; доминировать

prepare — подготавливать; составлять

pressure — давление

prevent — предотвращать; предохранять препятствовать

prevention — предотвращение; предупреждение

primarily — главным образом; преимущественно; в основном

print — печатать; выводить на экран

- engine — механизм печати

~ head — головка печати

printer — принтер; печатающее устройство

character ~ символьный принтер

dot-matrix - точечно-матричный принтер

graphical / image ~ графический принтер

impact″ контактный принтер

ink-jet * струйный принтер

laser - лазерный принтер

letter-quality - принтер с типографским качеством печати

line (at-a-time) - принтер с построчной печатью page (at-a-time) ~ принтер с постраничной печатью print out — распечатка; вывод на печать или экран procedure — процедура; процесс; метод; алгоритм

accounting - процедура учета

computational - алгоритм вычислений

control - метод управления

error-correcting - процедура / алгоритм исправления ошибок

formatting - процедура / процесс форматирования

installation - процедура / процесс установки (системы)

solution - алгоритм решенияQ

quality — качество; свойство; характеристика

image - качество изображения

running ~ рабочая характеристика quantity — количество; число; величина; значение

absolute - абсолютная величина

alternating - переменная величина

continuous - непрерывная величина

digital - числовое значение

discrete - дискретная величина

input - входная / вводимая величина

unknown - неизвестная величина

variable ~ переменная величина

quit —- выход (из программы); выходить (из программы) quitting — выход (из программы)

**R**

raise — поднимать; повышать; увеличивать; подъем; повышение random — случайный; произвольный random-access — с произвольным доступом ~ memory (RAM) — память с произвольным доступом range — диапазон; область; интервал rate — степень; скорость bar-code - устройство считывания штрих-кода character - устройство считывания / распознавания знаков reading — чтение; считывание read-only — работающий только в режиме чтения reason —причина; основание; довод; обосновывать; заключать reasonable — разумный; допустимый receive — принимать; получать receiver — приемное устройство

record — запись; регистрация; записывать; регистрировать recorder — устройство / программа регистрации; самописец data ~ устройство регистрации данных tape - запись на (магнит.) ленту reduce — уменьшать; сокращать; понижать; сжимать reduction — уменьшение; сокращение; понижение; сжатие (данных)

red — катушка; бобина

reference — ссылка; сноска; справочник; руководство computer ~ руководство по работе с компьютером hardware - документация по аппаратному обеспечению for - для справки in - to — по отношению к make - ссылаться; упоминать user - руководство для пользователя without - to — независимо от referenced — вызываемый; указываемый regardless — несмотря на; независимо от register — регистр; устройство регистрации; счетчик; датчик address - адресный регистр base - базовый регистр cash - кассовый аппарат clock ~

счетчик времени; таймер command / Instruction - регистр команд exchange — скорость обмена - of response — быстрота реакции reader — устройство считывания bar-code ~ устройство считывания штрих-кода character - устройство считывания / распознавания знаков reading — чтение; считывание read-only — работающий только в режиме чтения reason —причина; основание; довод; обосновывать; заключать reasonable — разумный; допустимый receive — принимать; получать receiver — приемное устройство record — запись; регистрация; записывать; регистрировать recorder — устройство / программа регистрации; самописец data - устройство регистрации данных tape - запись на (магнит.) ленту reduce — уменьшать; сокращать; понижать; сжимать reduction — уменьшение; сокращение; понижение; сжатие (данных) reel — катушка; бобина reference — ссылка; сноска; справочник; руководство computer ~ руководство по работе с компьютером hardware ~ документация по аппаратному обеспечению for - для справки in ~ to — по отношению к make - ссылаться; упоминать user - руководство для пользователя without -to — независимо от referenced — вызываемый; указываемый regardless — несмотря на; независимо от register — регистр; устройство регистрации; счетчик; датчик address - адресный регистр base ~ базовый регистр cash - кассовый аппарат clock - счетчик времени; таймер command / Instruction ~ регистр команд counter - регистр счетчика general-purpose - регистр общего назначения memory / storage ~ регистр памяти operand - регистр операнда remove — удалять; устранять; убирать rename — переименовывать replace — заменять; замещать

replacement — замена; замещение; смена; подстановка represent — представлять representation — представление

pictorial / picture ~ графическое представление require — требовать

requirement — требование; необходимое условие; потребность research — исследование; изучение; исследовать reset — сброс; восстановление; возврат в исходное состояние;

сбрасывать; восстанавливать

- button — кнопка сброса

- computer — перезагружать компьютер

resource — ресурс; средство; возможность

data ~ информационный ресурс printer - средство

вывода на печать security ~ средство защиты software -

программный ресурс storage ~ ресурс памяти

respect — отношение; учитывать; принимать во внимание; соблюдать

routine — (стандартная) программа / операция; (установленный) порядок

ruggedness — прочность

rule — правило; управлять; руководить

ruler — (масштабная) линейка

run — выполнять, запускать (программу); работать; запуск; прогон; выполнение

running — запуск; выполнение; работа

run-time version — исполняемая версия

**S**

safe — безопасный; надежный

safety — безопасность; надежность

save — сохранять; сберегать

scale — шкала; масштаб

scaling — масштабирование

scan — просмотр; сканирование; развертка; просматривать

scanner — сканер; устройство оптического считывания bar-code - устройство считывания штрих-кода color - цветной сканер hand / manual - ручной сканер laser - лазерный сканер optical / visual - оптический сканер

scanning — просмотр; поиск; развертка; считывание; сканирование

schedule — план; расписание; график

scheduling — составление расписания или графика; планирование

science — наука; теория

scientific — научный selectivity — избирательность

semiconductor — полупроводник

bipolar - биполярный полупроводник

metal-oxide - структура металл-оксид полупроводник sensibility — чувствительность sensitive — чувствительный sensor — датчик

separate — отделять(ся); отдельный; изолированный separation — разделение; отделение sequence — последовательность

alphabetic - алфавитный порядок

arithmetic - последовательность арифметических операций

binary - двоичная последовательность

character / string - порядок следования символов

code - последовательность кодов

command / instruction - порядок выполнения команд

data - порядок размещения данных

digital - цифровая последовательность

historical - хронологическая последовательность

increasing ~ возрастающая последовательность

in - последовательно; по порядку

out of - не по порядку serve — обслуживать;

служить

server — сервер; обслуживающая / сервисная программа service — обслуживание; услуги;

shape — форма; придавать форму

share — совместно использовать; делиться (информацией); часть; доля

sharing — совместное использование; коллективный доступ; разделение

shift — сдвигать; перемешать; сдвиг; смещение; смена регистра

shortcoming — недостаток; изъян; дефект

sign — знак; символ

significance — значимость; важность; значительность; значение; смысл

silicon — кремний

similar — подобный; аналогичный

similarity — сходство; подобие

similarly — подобным образом; так же

simple-to-use — простой в использовании

simplicity — простота

simplify — упрощать(ся)

simulate — моделировать; имитировать

simulation — моделирование; имитация

simulator — имитатор; тренажер; программа моделирования / имитации

skip — пропускать; переходить

slide — скользить; сдвигать; смещать

- rule — логарифмическая линейка

slot — гнездо; разъем; щель; ниша

bus - гнездо для подключения к шине expansion - разъем для модуля расширения

# T

table — таблица

tabulate — табулировать; заносить в таблицу tabulation — занесение в таблицу

take — брать; выбирать (команду); принимать (вид, значение) ″ advantage of — воспользоваться

- care — принимать меры; проследить
- into account / consideration — учитывать; принимать вовнимание
- notes — записывать; регистрировать

tape — магнитная лента

- backup unit — устройство получения резервных копий на магнитной ленте
- drive — накопитель на магнитной ленте

technique — метод; способ; техника; технические приемы; методика advanced ~ усовершенствованная методика; современная технология computing - вычислительная техника display / video ~ техника отображения; способ вывода на экран formatting - способ форматирования hardware - метод аппаратного решения measuring - измерительная техника numerical - метод числовых вычислений programming ~ методика программирования software ~ метод программного решения

technology — технология; техника; методика; методы; способы

template — шаблон; маска; образец; форма

temporarily — временно

terminal — терминал; зажим; вывод; конец alphanumeric - текстовый терминал character - текстовый терминал point-of-sale - кассовый терминал remote - удаленный терминал security ~ защищенный терминал

- adapter — терминальный адаптер

~ mode — терминальный режим

thin-film magnetic medium — тонкопленочный магнитный носитель tool — средство; инструмент

total — общий; суммарный; совокупный; итоговый; весь; целый

touch pad — сенсорная панель

tracing — слежение; поиск; выявление; определение; трассировка fault - поиск неисправностей

track — след; траектория; путь; следить; прокладывать путь

trackball — трекбол

transaction — транзакция; группа операций

transfer — передача; пересылка; переход; передавать; пересылать; переносить ~ rate — скорость пересылки

transform — преобразовывать; превращать; трансформировать

transformation — преобразование; трансформация

transformational, transformative — трансформационный; связанный с преобразованием

transformer — преобразователь; устройство преобразования; трансформатор

transition — переход; превращение; модификация

translate — транслировать; преобразовывать; переводить

translator — транслятор; преобразователь

transmission — передача; пересылка; распространение; пропускание

transmit — передавать; посылать; пропускать transmitter — передатчик; датчик; преобразователь transparent — прозрачный; незаметный

transparently — с соблюдением прозрачности; незаметным образом

trapping — вылавливание; перехват

error ~ поиск ошибок trigger — пусковая кнопка trouble — неисправность; р/.нарушения; неполадки; трудности; затруднения

troubleshoot — искать неисправности; диагностировать; отыскивать ошибки

tuner — ручка настройки; программа настройки (параметров)

tuning — настройка; регулирование

typewriter - машинописный шрифт typewriter — печатающее устройство

U

unable — неспособный

unacknowledged — неподтвержденный (о приеме сообщений)

unaided eye — невооруженный глаз

unattached — неподсоединенный

unbelievable — невероятный; неправдоподобный

unchanged — неизменный; неизмененный

uncontrollable — неуправляемый; нерегулируемый; неконтролируемый

underline — подчеркивать

undertake — предпринимать

undo — отменять; отмена

unit — устройство; модуль; механизм; узел; блок; элемент ~ of data — блок данных ~ of language — элемент языка

- of measurement — единица измерения

~ of memory — блок памяти

arithmetic - арифметическое устройство

arithmetic and logical ~ арифметико-логическое устройство

central processing - центральный процессор

computing - вычислительное устройство

control ~ устройство управления

input - устройство ввода

input / output - блок ввода-вывода

operational - работающее устройство

output ~ устройство вывода

power (supply) - блок питания

processing - устройство обработки; процессор

programming - устройство программирования; программатор

reader - считывающее устройство

unplugging — отсоединение; отключение unsuitable — неподходящий; непригодный usage — использование; применение; эксплуатация use — польза; использовать; применять

in - используемый; задействованный

of - полезный

of general - общеупотребительный

of no - бесполезный

make -of— применять; использовать used — используемый; применяемый useful — полезный; пригодный useless — бесполезный user — пользователь; абонент

advanced / expert - квалифицированный пользователь utility — полезность; пригодность; (сервисная) программа; вспомогательное средство

up-to-date — самая последняя версия программы utilize — использовать

## V

valid — правильный; допустимый

validity — правильность; адекватность; допустимость; пригодность

valuable — ценный; полезный value — значение; величина; значимость

acceptable - допустимое значение

additional - дополнительное значение

binary - двоичное значение

byte ~ значение в виде байта

character - значение кода символа

check - контрольное значение

correct - правильное значение

data - информационное значение

invalid - неверное, недопустимое значение

numeric - числовое значение

output - выводимое / выходное значение

valid - верное / допустимое значение variable — переменная (величина)

variety — разнообразие; verifier — устройство / программа проверки

verify — проверять; контролировать

versatile — разносторонний; многофункциональный; универсальный

versatility — разносторонность; многофункциональность; универсальность

version — версия; вариант

common - распространенная версия data ~ вариант

данных electronic - электронная версия executable -

исполняемая версия original - первоначальный вариант

view — вид; представление; просмотр

viewpoint — точка зрения

viewport — окно просмотра / вывода

virtual — виртуальный; нереальный; несуществующий

voltage — (электрическое) напряжение

volume — объем; величина; количество sound ~ громкость

звука

vulnerability — уязвимость; чувствительность; подверженность

vulnerable — чувствительный; уязвимый; подверженный

## W

wafer — пластина; подложка

wait — ожидание; ждать, ожидать

want — недостаток; нехватка; потребность; недоставать; требо-
вать(ся)

wanted — нужный; необходимый wanting — предупреждение

watchdog — сторожевая программа waveguide — волновод

wavelength — длина волны way — путь; способ; средство;
возможность

in a - в некотором отношении; до известной степени

in any - любым способом; как угодно

in different -s разными способами; по-разному

in no - ни в коей мере; никак

in the same - так же; таким же образом

World-Wide - всемирная информационная сеть wide area network
— глобальная сеть width —ширина; разрядность (шины, памяти)

withdraw — удалять; убирать; вынимать withdrawal — удаление;
выемка; изъятие word — слово; текстовый

- processing — редактирование текстов

" processing program — текстовый редактор

~ wrap — перенос слов worksheet — электронная таблица world wide —
глобальный; всемирный worm — (компьютерный) червь writer —
записывающее устройство; программа записи; автор;

разработчик

## X

xerocopy — ксерокопия

xerox — ксерокопировать

X-ray — рентгеновский (об излучении монитора)

## Y

yet — тем не менее; все же; еще

yield — выход (результатов); выдача; выдавать; получать (значение)

## Z

zero — нуль; нулевой; обнулять

of ~ равный нулю

to ~ out — обнулять

time - начало отсчета времени zone — зона; область;

полоса

*Учебное издание*

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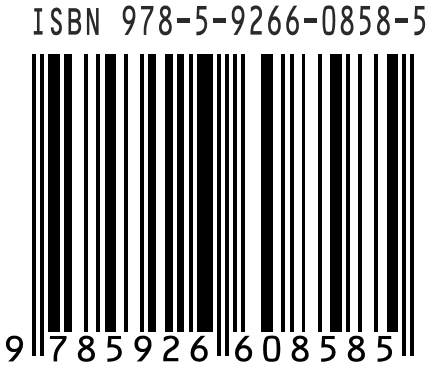


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