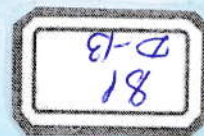


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Mazkur o'quv qo'llanma pedagogika oliy o'quv yurtining mutaxassisligi chet tili bo'lmagan fakultetlari, matematika va informatika yo'nalishi talabalari uchun mo'ljallangan. O'quv qo'llanma talabalarni nafaqat mashg'ulotlar davomida foydalanishlari uchun balki, ingliz tilini mustaqil o'rganishlarida ham foydalidir.

Qollanma tuzilishi 2 qismdan tashkil topgan. Ular quydagilar: Informatika yo'nalishida o'z faniga mos mavzular va grammatik zamonlar hamda mashqlar berilgan, matematik belgi va terminlari inglizcha-o'zbekcha-ruscha lug'at minimumlaridan iborat.

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KIRISH

O'zbekiston Respublikasi Prezidentining til to'g'risidagi 2021yil 19 mayda qabul qilingan "O'zbekiston respublikasida xorijiy tillarni o'rganishni ommalashtirish faoliyatini sifat jihatdan yangi bosqichga olib chiqish chora tadbirlari to'g'risida" PQ-5117- sonli qarori chiqqan kundan boshlab toki shu kungacha barcha oliy ta'lim muassasalarida chet tillarini o'qitish sistemasini yanada takomillashtirish, yangi davlat ta'lim standartini yaratish, dasturlar ishlab chiqish, ushbu dasturlar asosida darsliklarni, o'quv qo'llanmalarni yangi avlodlarini yaratish, shular asosida bugungi kun talabiga javob beradigan mutaxassislarni tayyorlash vazifasi turadi. Hozirgi paytda xorijiy tillarni o'rganish va o'rgatishga yurtimizda katta ahamiyat berilmoqda.

Ushbu o'quv qo'llanma Pedagogik oliy ta'lim muassasalarining nofilologik yo'nalishlari talabalari ya'ni "Matematika va Informatika o'qitish metodikasi" yo'nalishi talabalari uchun mo'ljallangan bo'lib, bu ularning o'z sohalari bo'yicha terminlar va iboralarni o'rganishlariga hamda ularni kelgusida qo'llay olishlariga yordam beruvchi mashqlardan iborat. Qo'llanma matnlar va shu matnlarga oid bir qancha mashqlarni o'z ichiga oladi. Shuningdek bu mashqlar og'zaki nutq, yozma tarjima va ingliz tili grammatikasi mahoratlarini oshirish maqsadida auditoriyada va mustaqil ishlash uchun tuzilgan bo'lib, 2 ta moduldan tashkil topgan. Har bir modul yo'nalishga qarab mo'ljallangan bo'lib, undagi matnlar hozirgi zamon kompyuter texnologiyalariga va matematik terminlarga oid dolzarb matnlardir. Bu matnlar va ulardan keyingi mashqlar talabalarning ushbu sohaga oid maxsus atamalarni yaxshi o'zlashtirishiga va tarjima mahoratini oshirishga yordam beradi. Matnlarga oid berilgan mashqlar talabalarning o'rganilgan matn bo'yicha ijodiy fikrlash qobiliyatini oshiradi va ularni o'z fikrlarini erkin ifodalashga o'rgatadi. Har bir darsga berilgan yangi so'zlarning muqobillari uslubiy qo'llanma bilan ishlashda

matnlarni yanada yaxshiroq tushunish imkonini beradi. Har bir darsda berilgan oq'zaki nutq uchun matnlar talabalarning erkin fikrlash va gapirish qobiliyatini, tarjima qilish mahoratini, o'qish texnikasini oshiradi, ularning bilimini mustahkamlaydi.

LESSON 1

I. Read and translate the text.

COMPUTERS

Computers are now essential in many areas of life - modern banking, information technology and many others. However, this is not true for education.

There are some subjects which may be better taught using computers. Elementary mathematics, elementary language learning, any subject that requires a student to memorize basic facts through repetition is good to computer learning. The computer can be programmed to provide an endless number of simple questions, and as the student answers these questions the facts are learned.

However, in the learning and practice of more complex ideas, the computer is not adequate. A computer can evaluate an answer as right or wrong, but it cannot determine why. It cannot find out why a student is making mistakes, and then explain important concepts in a different way so the student will understand. Task connected with explanation cannot be taught by computers as there are too many variables for a computer to deal with successfully.

Thus, while computers may be useful for practicing simple skills, they are not an essential feature of modern education. Until further developments in computers are made, the human teacher will remain indispensable.

ASSIGNMENT TO LESSON 1

II. Answer the following questions:

1. Which areas of life are computers essential in?
2. What are the subjects which can be taught with the help of computers?
3. What can't a computer determine and why?

III. Write out sentences with the Passive Voice and translate them.

IV. Make all types of questions to the following sentence:

There are some subjects which may be better taught using computers.

V. Translate from English into Uzbek.

1. information technology. 2. elementary language learning. 3. to provide an endless number of simple questions. 4. more complex ideas. 5. to explain important concepts. 6. to practice simple skills.

VI. Match up:

simple.....ideas
modern.....an answer
information.....skills
elementary.....learning
computer.....concepts
complex.....technology
to evaluate.....banking
important.....mathematics

VII. Fill in the blanks:

indispensable, variables, important concepts, a computer, evaluate, computer learning

1. If you want to memorize basic facts through repetition you can refer to ...

2. A computer can only ... whether the answer is right or wrong.

3. ... can't find out why a student makes mistakes.

4. A computer can't explain . so that the student will understand them.

5. As there are too many ... the computer can't deal with them successfully.

6. The computers are ... in practicing simple skills.

IX. Give summary of the LESSON

LESSON 2

I. Read and translate the text.

IS THERE AN END TO THE COMPUTER RACE?

Today the word «electronics» is in general usage. Millions of people have electron watches. There are a lot of various radio and TV sets, video cassette recorders and CD players in our houses. In factories and plants we are surrounded with electronically controlled machines and instruments, we are carried by airplanes, ships, trains and cars with built-in electronic devices, and satellites circle the globe. In other words, we are living in an electronic world.

And the center of this world is a tiny silicon plate¹ of a few square millimetres, an integrated circuit², or a chip³, as it is more commonly known. The integrated circuit is undoubtedly one of the most sophisticated inventions of man, science and technology. It is in the heart of every electronic device and the more cassette recorders, TV sets and computers we need, the more integrated circuits are required.

When we speak about a further development of computers we mean not only quantity, but also high technology and high speed. As the operation of an integrated circuit depends on microscopic «components», the purity of all materials and the cleanness at the plant they are produced at must be of the highest quality. A continuous search is going on in laboratories throughout the world for more perfect, reliable and high speed electronic circuits.

In the past it took scientists and researchers a whole lifetime to make a few thousand calculations, whereas for a modern computer this task is a matter of a few seconds. At present computers capable of performing billions of operations a second are required. Supercomputers are different from ordinary computers. The ordinary computer does the computations operation by operation; while the

supercomputer operates like a brain: all operations are being done simultaneously.

In the next few years engineers will complete the work on computers of above 2 billion operations a second. It will take a few more years to produce a 10-billion operations computer. The fifth-generation computers performing 100 billion operations a second will become available in the near future. Is there an end to this race?

According to some researchers, we are close to what can be regarded as a true physical limit. But other specialists think that photons will make the operation a thousand times faster. This means that in the future it will be possible to expect the appearance of photon computers and that computations will be done by means of light. Light has several advantages over electronics: light beams are faster, travel in parallel lines and can pass through one another without interference. Already, the optical equivalent of a transistor has been produced, and intensive research on optical-electronic computers is being carried out in a number of countries around the world. In a few decades a new age of light may replace the still youthful electronic age. The race is going on.

Notes to the LESSON: 1. silicon plate - кремниевая пластина; 2. integrated circuit - интегральная схема; 3. chip - кристалл.

ASSIGNMENT TO LESSON 2.

II. Answer the questions to the above LESSON

1. What is this LESSON about? 2. What new things appeared in people's everyday life after World War II? 3. What is at the center of all these things? 4. What applications of computers do you know? 5. Where else may computers be used? 6. How does an ordinary computer (a supercomputer) operate? 7. What is the speed of a new supercomputer? 8. What is the task of

engineers in the field of computer development? 9. What types of computers do you know? 10. What are the prospects in the development of computers?

III. Make all types of questions to the following sentence:

the integrated circuit is undoubtedly one of the most sophisticated inventions of man, science and technology.

IV. Match up:

General.....speed
electronically controlled..... beams
integrated..... computers
high..... search
continuous..... usage
photon..... circuit
light..... machines

V. Put the words in brackets in the correct order:

1. (but/we/mean/also/computers/we/quantity/and/high speed/when/a further development of/high technology/speak about not only).

2. (electronic circuits/and/in laboratories/reliable/for more perfect/throughout the world/is going on/high speed/a continuous search).

3. (operates/the ordinary computer/all/operation by operation/are being done/the supercomputer/does/simultaneously/the computations/operations/ while/like a brain).

VI. Fill in the blanks:

true physical limit, high technology and high speed, a continuous search, computations, the integrated circuit

1. ... is in the heart of every electronic device we use at

present.

2. When speaking about further development of computers we first of all speak about . .

3. ... is going on in laboratories to work out more perfect, reliable and high speed electronic circuits.

4. The ordinary computer does the ... operation by operation.

5. Some researchers think that with the invention of the fifth generation computers we approach what is called

LESSON 3

I. Read and translate the text.

COMPUTER LITERACY

Informed citizens of our information-dependent society should 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 privileged people had an opportunity to learn the basics, called the three R's: reading, writing, and arithmetic. 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, arithmetic, 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.

ASSIGNMENT TO LESSON 3.

II. Answer the questions to the above 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.

III. Read and translate.

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.

IV. Give the three forms of the following 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.

V. Make them 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 new computer.

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.

LESSON 4

Read, translate and render the conversation in reported speech.

COMPUTERS

Mary: Have you seen an interesting advertisement in the last issue of «The Economist»?

John: I haven't read it yet.

M.: The School of Engineering offers a new program in information system. Applications are invited for jobs in this field.

J.: Professor Smith has told me about it. This program is interesting. It is designed to meet the needs of persons with a computing background for their work in management and industry.

M.: Don't you think that our son can lecture on this new program?

J.: Why not? He graduated from the Department of Computer Science and for some years was taking part in the research project connected with the problems of supercomputers and their manufacturing.

M.: As far as I remember his research interests cover software and application.

J.: And what do they say about the contract?

M.: It is a three years' contract and it may be extended for further two years. I'll write Mike a letter. J.: It's too long. You'd better call him.

ASSIGHMENT TO LESSON 4.

1. Role plays. Working in pairs.

11. Making similar dialogues.

LESSON 5

I. Read and translate the text.

MS-DOS AND ITS MAIN TERMS What is MS-DOS

The Microsoft MS-DOS *operating system* is like a translator between you and your computer. The programs in this operating system allow you communicate with your computer, your disk drives and your printer, letting you use these resources to your advantage.

MS-DOS also helps you to manage programs and data. Once you have loaded MS-DOS into your computer's memory, you can compose letters and reports, run programs and languages such as Microsoft GW-BASIC, and use devices such as printers and disk drives.

Terms You Should Know

When you are introduced to a new or different idea, you must often learn a new set of words to understand the idea. The MS-DOS operating system is no exception. The following pages explain some terms you will need to know so that you can read and use the manuals.

Programme.

Programs, often called *application programs*, *applications*, or *software* are series of instructions written in computer languages. These instructions are stored in files and tell your computer to perform a task. For example, a program might tell your computer to alphabetically sort a list of names. Spreadsheets and word processors are other examples of programs.

File

A file is a collection of related information, like the contents of a file folder in a desk drawer. File folders, for instance, might

contain business letters, office memos, or monthly sales data. Files on your disks could also contain letters, memos, or data. For example, your MS-DOS master disk contains more than thirty files. Your other disks may contain files that you've created, or that came with the disk.

Filename

Just as each folder in a file cabinet has a label, each file on a disk has a name. This name has two parts: a *filename* and an *extension*. A filename can be from one to eight characters in length, and can be typed in uppercase or lowercase letters. MS-DOS automatically converts filenames to uppercase letters.

Filename extensions consist of a period followed by one, two, or three characters. Extensions are optional, but it's good idea to use them, since they are useful for describing the contents of a file to you and to MS-DOS. For instance, if you want to be able to quickly identify your report files, you can add the filename extension *rpt* to each one. Here's an example of a filename with this extension.

progress .rpt *filename extension*

Directory

A directory is a table of contents for a disk. It contains the names of your files, their sizes, and the dates they were last modified.

Volume Label

When you use a new disk, you can put a label on the outside of it to help you identify its contents. You can also give each of your disks an internal name, called a *volume label*.

You can look at the volume label on a disk by displaying its directory. Some programs may look at the volume label to see if you are using the correct disk. So make sure that you label your disks.

AXBOROT RESURS MARKAZI

Disk Drive

To use the files or programs that are on a floppy disk, you must first insert the disk into a floppy disk drive. Floppy disk drives are commonly referred to as the A drive and the B drive. A hard disk drive, normally installed inside your computer, is usually referred to as the C drive.

Drive Name

A complete *drive name* consists of a *drive letter* and a *colon*. When using a command, you may need to type a drive name before your filename to tell MS-DOS where to find the disk that contains your file. For example, suppose you have a file named *finances.doc* on the disk in drive B. To tell MS-DOS where to find this file you would type the drive name before the filename: `b: finances.doc`

drive name filename with extension.

Command

Just as you will run programs to create and update files containing your data, you will also need to run some special programs, called MS-DOS commands, that let you work with entire files.

When you type MS-DOS commands, you are asking the computer to perform tasks. For example, when you use the `diskcopy` command to copy your MS-DOS master disk, you are using a file named *diskcopy.exe*, whose task is to copy the files on the MS-DOS disk.

Error messages

If you or your computer makes a mistake when using a device or MS-DOS command, MS-DOS displays an appropriate *error message*. Error messages apply to general errors (such as misspelling a command) or to device errors (such as trying to use a printer that is out of paper).

Memory

Memory is the place in your computer where information is actively used. When you run a program, MS-DOS stores that program and the files it uses in the computer's available memory. Some programs and files use more memory than others, depending on how large and complex they are.

Devices

Whenever you use your computer, you supply the information (input) and expect a result (output). Your computer uses pieces of hardware called *devices* to receive input and send output.

For example, when you type a command, your computer receives input from your keyboard and disk drive, and usually sends output to your screen. It can also receive input from a mouse, or send output to a printer. Some devices, such as disk drives, perform both input and output.

Device Names

Device names are special names given to each device that your computer "knows" about. An example of a device name is `LPT1`, which stands for the first parallel line printer connected to your computer.

When you add a new device, such as a mouse, to your computer, you sometimes need to tell MS-DOS about it by setting up (configuring) your computer for that device.

ASSIGNMENT TO LESSON 5.

II. Answer the questions to the above LESSON

1. What is MS-DOS? 2. What do the program in the system allow to do? 3. What is a program? 4. What is a file? 5. What can files contain? 6. What is a file name? 7. What are filename extensions for? 8. What is a directory? 9. Why should we give

a disk a volume label? 10. What drives do you know? 11. What commands are for? 12. What is memory used for? 13. What devices do you know?

III. Match up:

operating.....a task
 disk.....label
 to manage contents
 application.....disk
 to performsystem
 to describe.....programs and data
 volume.....files
 floppyprograms
 hard computer
 to update program
 to run drives
 to configuredisk drive

IV. Pick out the right definition:

1. Operating system
 - a) allows to communicate with computer and other devices;
 - b) a table of contents for the disk;
 - c) is a disk copy command.
2. Device
 - a) a disk drive;
 - b) a collection of related information;
 - c) a piece of hardware.
3. Program
 - a) a place where information is stored;
 - b) instructions written in computer language;
 - c) devices to perform commands.
- 4) . File

- a) software;
- b) error message;
- c) collection of related information.

5) . Volume label

- a) internal name of disk;
- b) device name;
- c) filename.

V. Finish answering the questions:

1. What does MS-DOS allow to do? - It allows ...
2. What can you do if you load MS-DOS into your computer?
 - If you load MS-DOS into your computer you...
3. What are the synonyms of application program? - They are ...
4. What do files contain? - They ...
5. How many letters do filenames consist of? - They ...
6. How can an extension describe the contents of a file? - You can
7. Is an internal name of a disk called a volume label or a drive name? - It's ...
8. Is A drive meant for a floppy or a compact disk? - It's.....

VI. Find the correct answer:

1. What do you have to do to find the file you need?
 - a) To type a drive name.
 - b) To give a device name.
 - c) To give a filename extension.
2. Where is information stored?
 - a) In the program.
 - b) In the disk drive.
 - c) In the memory.
3. What devices can serve as input?
 - a) A printer.
 - b) A mouse.

c) A screen.

VII. Fill in the blanks:

volume label, files, device names, spreadsheets and word processors, a directory, uppercase or lowercase letters, floppy disk drive, programmes and data, a drive letter and a colon, optional.

1. MS-DOS also helps you to manage
2. ... are other examples of programs.
3. ... on your disks could also contain letters, memos, or data.
4. A filename can be from one to eight characters in length, and can be typed in ...
5. Extensions are ... , but it's good idea to use them, since they are useful for describing the contents of a file to you and to MS-DOS.
6. ... contains the names of your files, their sizes, and the dates they were last modified.
7. You can look at the . on a disk by displaying its directory.
8. To use the files or programs that are on a floppy disk, you must first insert the disk into a . .
9. A complete drive name consists of . .
10. . are special names given to each device that your computer "knows" about.

VIII. Translate:

1. The programs in this operating system allow you communicate with your computer, your disk drives and your printer, letting you use these resources to your advantage.
2. MS-DOS also helps you to manage programs and data.
3. Filename extensions consist of a period followed by one, two, or three characters.
4. Floppy disk drives are commonly referred to as the A drive and the B drive.
5. If you or your computer makes a mistake when using a

device or MS-DOS command, MS-DOS displays an appropriate error message.

XI. Give summary of the LESSON.

LESSON 6

I. Read and translate the text.

WINDOWS

Microsoft Windows (or simply Windows) is a software program that makes your IBM PC (or compatible) easy to use. It does this by simplifying the computer's *user interface*.

The word *interface* refers to the way you give your computer commands, the way you interact with it.

Usually the interface between you and the computer consists of the screen and the key board, you interact with the computer by responding to what's on the screen, typing in commands at the DOS command line to do your work.

DOS often isn't very intelligent at interpreting your commands and most people consider it awkward or intimidating as a user interface. These commands can be confusing and difficult to remember. Who wants to learn a lots of computer commands just to see what's on your disk, copy a file, or format a disk?

Windows changes much of this. What's been missing from the PC is a program that makes the computer easy to use. Windows is just such a program. With Windows, you can run program, enter and move data around, and perform DOS-related tasks simply by using the *mouse* to point at objects on the screen. Of course, you also use the keyboard to type in letters and numbers.

Windows interprets your actions and tells DOS and your computer what to do.

In addition to making DOS housekeeping tasks such as creating directories, copying files, deleting files, formatting disks, and so forth, easier, Windows makes running your favorite *applications* easier, too. (An application is a software package that you use for a specific task, such as word processing).

Windows owes its name to the fact that it runs each

program or document in its own separate *window*. (A window is a box or frame on the screen.) You can have numerous windows on the screen at a time, each containing its own program and/or document. You can then easily switch between programs without having to close one down and open the next.

Another feature is that Windows has a facility - called the Clipboard - that lets you copy material between dissimilar document types, making it easy to *cut* and *paste* information from, say, a spreadsheet into a company report or put a scanned photograph of a house into a real estate brochure. In essence, Windows provides the means for seamlessly joining the capabilities of very different application programs. Not only can you paste portions of one document into another, but by utilizing more advanced document-linking features those pasted elements remain "live". That is, if the source document (such as some spreadsheet data) changes, the results will also be reflected in the secondary document containing the pasted data.

As more and more application programs are written to run with Windows, it'll be easier for anyone to learn how to use new programs. This is because all application programs that run in Windows use similar commands and procedures.

Windows comes supplied with a few of its own handy programs. There's a word-processing program called Write, a drawing program called Paintbrush, a communications program called Terminal for connecting to outside information services over phone lines, small utility programs that are helpful for keeping track of appointments and notes, a couple of games to help you escape from your work, and a few others.

Years of research went into developing the prototype of today's popular graphical user interfaces. It was shown in the early 1980s that the graphical user interface, in conjunction with a hand-held pointing device (now called the mouse), was much easier to operate and understand than the older-

style keyboard-command approach to controlling a computer. A little-known fact is that this research was conducted by the Xerox Corporation and first resulted in the Xerox Star computer before IBM PCs or Macintoshes existed. It wasn't until later that the technology was adapted by Apple Computer for its Macintosh prototype, the Lisa.

ASSIGNMENT TO LESSON 6.

II. Answer the questions to the above LESSON

1. What are the advantages of Windows? 2. What is Windows? 3. Why do we call it Windows? 4. What is another feature of Windows? 5. What firm was the first to have some results developing the prototype of Windows?

III. Make all types of questions to the following sentence:

windows interprets your actions and tells DOS and your computer what to do.

IV. Write out five sentences with Present Simple and translate them.

V. Match up:

software..... with computer
user.....information
to interact program
to make the computer..... disk
to delete program
to format.....easy to use
to paste interface
utilityfiles

VI. Pick out the right definition:

1. User interface
 - a) a software package;
 - b) commands given to computer;
 - c) document-linking features.
2. Application
 - a) pasted data;
 - b) a device name;
 - c) a software package for a specific task.
3. To paste
 - a) to copy dissimilar document types;
 - b) to run a command;
 - c) to create a directory;
4. A window
 - a) a command line;
 - b) a box or frame on the screen;
 - c) a seamless joining of different programs.
5. Paintbrush
 - a) a word processing program;
 - b) a communication program;
 - c) a drawing program

VII. Finish answering the questions:

1. What is the user interface for? - It's meant for
2. How do the user and the computer interact? - They interact with
3. What is the mouse for? - It's meant for
4. What does Windows owe its name to? - It owes
5. What do words "cut" and "paste" mean? - They mean
6. What handy program supplied by Windows do you know? - They are ...
7. Was Xerox or Macintosh the first to produce the mouse? - It ...

V111. Put the words in brackets in the correct order:

1. supplied with/its own/programs/a few of/comes/handy/ Windows.
2. open the next/one down/between/programs /switch/without having to close/ then/easily/can/and/you.
3. document/runs/that/its name/separate/it/owes/each program/or/ Windows /in its own/to the fact/ window.

IX. Fill in the blanks:

Write, on the screen, handy programs, seamlessly joining, applications, user interface, interprets.

1. ... is an instrument to simplify the usage of your computer.
2. Windows your actions and tells DOS and your computer what to do.
3. Windows makes running your favorite easier
4. You can have numerous windows ... at a time, each containing its own program.
5. Windows provides the means for the capabilities of very different application programs.
6. Windows comes supplied with a few of its own
7. Windows has got a word processing program called....

X. Translate:

1. Microsoft Windows (or simply Windows) is a software program that makes your IBM PC (or compatible) easy to use by simplifying the computer's user interface.
2. DOS often isn't very intelligent at interpreting your commands and most people consider it awkward or intimidating as a user interface.
3. You can then easily switch between programs without having to close one down and open the next.
4. As more and more application programs are written to run with Windows, it'll be easier for anyone to learn how to use

new programs.

XI. Give summary of the LESSON.

LESSON 7

COMPUTERS CONCERN YOU

When Ch. Babbage, a professor of mathematics at Cambridge University, invented the first calculating machine in 1812, he could hardly have imagined the situations we find ourselves in today. Almost everything in modern world is done with the help of computers - the complicated descendants of his simple machine. Computers are being used more and more extensively in the world today, for the simple reason that they are far more efficient than human beings. They have much better memories and can store great amount of information and they can do

calculations in a fraction of the time required by a human mathematician. No man alive can do 500,000 sums in one second, but a modern computer can.

In fact, computers can do many things we do, but faster and better. They can control machines at factories, work out tomorrow's weather and even play chess, write poetry or compose music. Let's look now at some of the ways in which computers concern people in their daily lives and work.

Many people associate computers with the world of science and mathematics, but they are also a great help to scholars in other subjects: in history, literature and so on. It is now possible for a scholar to find a book or an article he needs very quickly, when a million or more new books are published each year, which is quite an advantage. You tell the computer which subject you are interested in and it produces any microfiche you need in seconds.

There are also systems which are being developed to translate articles from foreign magazines by computer and to make up many lists of information which are needed in a modern library. So, computer can help us to deal with the knowledge explosion in many ways. One can imagine a time when libraries

will be run by computers, without human beings at all.

Or, let's take another example. When a man drives a car for long distances he has two problems: to keep the car at a constant speed and watch that he does not run into the car in front of him. Engineers are now experimenting with a system which has a computer control of these two problems. The car's computer keeps the speed constant. At the same time the distance between the car and any other car in front of it is measured by a beam of light transmitted forwards. The beam meets the rear reflectors of the car in front and it is reflected back, which enables to measure the distance. This information is fed to the computer which adjusts its speed control accordingly.

ASSIGNMENT TO LESSON 7

I. Read and translate the text.

II. Answer the following questions:

1. What did Ch. Babbage invent in 1812? 2. Why are computers extensively used nowadays? 3. In what ways do computers help people in their everyday life?

III. Make all types of questions to the following sentence:

engineers are now experimenting with a system which has a computer control of these two problems.

IV. Give Russian equivalents:

to be used extensively, great amount of information, scholar, to be developed, to be run, to keep constant, a beam of light, to be fed.

V. Write out five sentences with the Passive Voice and translate them.

VI. Match up:

to enablethe knowledge explosion
calculating.....the speed constant
complicated.....by computers
to storemachine
to do.....descendants
to deal with.....to measure
to be run.....calculations
to keep.....great amount of information

VII. Put the verbs into the correct tense form and find the correct answer to the questions:

1. When (to invent) Ch. Babbage the first calculating machine?
 - a) In 1912.
 - b) In 1812.
 - c) In 1712.
2. What (to be) done with the help of computers?
 - a) Almost nothing.
 - b) Almost something.
 - c) Almost everything.
3. What (can) computers do better?
 - a) Read and write.
 - b) Store information and do calculations.
 - c) Understand and solve problems.
4. What systems (to be developed) nowadays?
 - a) To translate articles from foreign magazines.
 - b) To read articles from foreign magazines.
 - c) To write articles in foreign magazines.
5. How (can) a computer help the driver?
 - a) To keep the driver awake.

- b) To control the speed and the distance.
- c) To help the driver have a rest.

VIII. Fill in the blanks:

being developed, calculations, more and more extensively, associate, advantage.

1. It is an . to find a book nowadays when there are millions of them published every year.
2. Computers are being used . in the world today.
3. They can do . in a fraction of the time required by a human mathematician.
4. Many people . computers with the world of science and mathematics.
5. There are also systems which are . to translate articles from foreign magazines by computer.

IX. Translate:

1. When Ch. Babbage, a professor of mathematics at Cambridge University, invented the first calculating machine in 1812, he could hardly have imagined the situations we find ourselves in today.
2. They can control machines at factories, work out tomorrow's weather and even play chess, write poetry or compose music.
3. Computer can help us to deal with the knowledge explosion in many ways.
4. Engineers are now experimenting with a system which has a computer control of these two problems.
5. Engineers are now experimenting with a system which has a computer control of these two problems.

X. Give summary of the above LESSON.

LESSON 8

ISAAC NEWTON

Sir Isaac Newton was a super genius of science who among other things invented calculus, stated the laws of gravity and optics. But it turned out Newton also made mistakes. The University of Chicago announced recently that R. Garusto, 23, a physicist, had discovered in one of Newton's calculations an error that had been undetected for three centuries.

The young scientist discovered it while he was studying Newton's masterpiece of physics «Principia» (1687). Newton had derived a figure for the Earth's mass based on his new theory that a single force - gravity -governed falling bodies on the Earth and the motion of planets around the Sun. The calculation depended on the angle between two lines from the Earth to the Sun, but because that angle was not exactly known at the time, Newton used slightly different figures in «Principia». It was that mistake that the young scientist found, was soon confirmed by other physicists. The mistake has no influence on Newton's theory, but its discovery was enough to get him a prize from the University of Chicago.

I. Answer the following questions:

1. What is Sir Isaac Newton famous for? 2. What had R. Garusto discovered? 3. What mistake did Newton make? 4. Has the mistake any influence on Newton's theory?

II. Translate the text.

III. Read the following computer terms, give their Russian equivalents and translate the sentences.

1. **Hardware** means the different types of equipment a computer consists of.
2. A computer's hardware comprises a **central processing**

unit (CPU) which is the heart and brain of the computer.

3. **Input and output devices** capable of putting information into a computer and getting it out of it are types of peripheral equipment. **Peripherals** are the units connected to the CPU: input devices,

output devices and storage devices.

4. The simplest and most common type of input device is a keyboard, containing a typewriter **keyboard**.

5. A **laser printer** is a kind of output device to print information.

6. **Software** means the programs needed to operate computer equipment.

7. These programs are on **disks**, the **hard disks** inside the computer, or **floppy disks**, or on **CD-ROMs**, that is, Compact Disk Read Only Memory, which you can put on or store a large amount of information. A **disk** is a storage device made of flat circular plates with magnetizable surfaces. A **hard disk** is a disk made from a solid magnetic material and used as a storage device. A **floppy disk** (also called diskette) is a disk made of flexible plastic material upon which data are stored on magnetic tracks. **Tracks** are areas marked on the surface of a disk. A **disk drive** is the electronic mechanism that actually reads what is on a disk. In hard disks, the disk and the drive are built into a single unit.

8. A **word processor** is a computer used to write documents, letters and reports, or the software that is used for this purpose.

9. **Databases** are program, which allow you to store, look at or change a large quantity of information quickly and easily.

10. **Graphics** are pictures and symbols a computer program can produce.

11. An extra copy on a floppy disk is called a **back-up copy**, a copy of data or software, usually kept in case the original disk is damaged or destroyed.

12. A **bug** possible in a computer operation, also a virus is a software problem or error in a program. **Debugging** means correcting program errors or bugs.

13. People send **e-mail** (electronic mail) messages with the help of the **Internet**, a system that lets computers connect by telephone lines.

A **laptop** is a portable computer weighing about 2-4 kg.

14. With a device called the **mouse** you can do a number of things by **clicking** on different **icons**.

15. A **mouse** is a small input device, on the top of which there are one or more buttons for communicating with the computer.

16. **Clicking** is a basic mouse action to place a cursor to close a window, etc.

17. An **icon** is a small picture representing an object, process or function.

LESSON 9

I. Read and translate the text.

GATEWAY 2000 The Main Part of the System

There are many hardware pieces in a computer system. Some are: the system board, power supply, keyboard, mouse, hard drive, monitor and the video card and its drivers.

The case

The large metal box that is the main part of the computer is called the case. The case and its contents (power supply, system board, etc.) are called the system unit. The case has several functions:

- Protects the delicate electronics inside.
- Keeps electromagnetic emissions inside so your TV, cordless phone, and stereo don't go haywire when you power up the computer.
- Can also hold the monitor.

Don't remove the case's cover unless you need to do something inside the unit, and always replace the cover when you are done.

The keyboard

You communicate with your computer with the keyboard. With it, you type instructions and commands for the computer, and information to be processed and stored. Many of the keys on the keyboard are like those on a typewriter: letter keys, punctuation keys, shift keys, tab and the spacebar. Your keyboard also has many specialized keys.

The instruction manuals for most software applications contain a section describing the functions of each key or combination of keys.

The mouse

The mouse works by sliding it around (ball down) on a flat surface. The mouse does not work if you hold it in the air like a remote control. The desktop is fine, but a ready-made mouse

pad is the best surface to roll the mouse on. Its surface is flat and usually somewhat LESSONured. If a surface is too smooth or rough, the ball inside can slip. As you glide the mouse, the ball inside moves in the direction of your movement. You will see the arrow on your screen moving in unison. The arrow is called a pointer, and the most important part is the very tip of its point. That's the only part the computer pays attention to. To use the mouse, slide it on the mousepad until the pointer's point is on something, like a button or an icon. Then:

Click - position the mouse pointer over an element and press and release the left mouse button one time.

Double-click - same as above except press the mouse button twice in quick succession *without moving the mouse between clicks*. It may take a little practice to not twitch the mouse when you first start double-clicking. Usually you double-click on an icon to start the program.

Drag - position the mouse pointer over an element, press and hold the left mouse button, and drag the mouse across the screen. The pointer moves, dragging the element. At the desired location, release the mouse button. The pointer lets go of whatever it was dragging.

An excellent way to practice using the mouse is to play the Solitaire game that comes with Windows.

The monitor

Your computer is not complete without the monitor, a TV-like device that usually sits on top of the computer. The monitor displays LESSON characters and graphics. It allows you to see the results of the work going on inside your system unit. The image that you see is made up of tiny dots called *pixels*. The sharpness of the picture depends on the number and size of these pixels. The more pixels, the sharper the image. This is called *resolution*.

A display adapter card is actually what builds the video images; the monitor simply displays them. The display adapter

for your system is either built onto the system board or is an expansion card plugged into your system board.

If you sit in front of a monitor for long periods of time, eye strain can be reduced if you follow a few guidelines:

- Use the computer in a room with even lighting. Adjust the controls on the monitor to vary the contrast and brightness of the display to suit the lighting in the room.

- Keep the screen clean.

- Adjust your chair so that you are looking down at the screen at a slight angle.

- Turn the monitor away from windows and bright lights to avoid glare.

Some of the controls on the monitor change the size and position of the image. You should set them for the largest image without losing any part of it.

You can set a *screen saver* to appear on your monitor screen if the computer sits idle for a period of time. Screen savers can reduce wear on your screen. Windows includes a number of screen savers.

The floppy drive

Floppy drives provide a way to pass files to and from the hard drive or to and from another computer. At Gateway 2000, we install either of two types of floppy disk drives:

- 3.5-inch 1.44MB drives, usually drive A;

- Combo drives (includes both a 3.5-inch 1.44MB drive and a 5.25-inch 1.2MB drive, called drive A: and drive B: respectively).

The drives can read and write on floppy diskettes. If you put a brand new diskette into the drive, the computer cannot read it. You have to format it first.

The hard drive

Unlike the floppy drive, the hard disk drive is inside the computer's case and you cannot see it. Usually it is referred to as drive C:. Hard drives also hold a lot of data. The smallest hard

drives Gateway 2000 offers hold more information than 100 floppies! The size of a hard drive is measured in megabytes, or MB for short.

The CD-ROM drive

The CD-ROM drive installed in your Gateway 2000 computer is similar to the one(s) you might have in your home or car. It can play music CDs as well as read software program CDs and the new Kodak photo CDs.

The amount and variety of material you can access with CD-ROM is amazing, particularly when you realize that a CD disc holds over 600MB of data! As far as your computer is concerned, the CD-ROM is just another hard drive, except that, although you can read from it, you can't save anything to it.

To operate the drive, press the Eject button to open the tray. Put a CD in the tray (label side UP!) and gently start to push the tray in. The motor takes over and pulls the tray the rest of the way in.

You can play ordinary music CDs if your system has speakers or if you plug earphones into the jack in the front of the drive.

ASSIGNMENT TO LESSON 9.

II. Answer the following questions:

1. What are the elements of hardware? 2. What is called the system unit? 3. What are the functions of the case? 4. What is the keyboard used for? 5. How does the keyboard function? 6. How does the mouse work? 7. What do you have to do with the mouse if you want to start the program? 8. What is dragging for? 9. What is the monitor for? 10. What does the sharpness depend on and how is it called? 11. How are video images built? 12. What regulations do you have to follow to reduce eye strain? 13. What is used to reduce wear on the screen? 14. What is the function of the floppy drive? 15. Why does the computer have

to format a new diskette? 16. Where is hard drive situated and how is it referred to? 17. What is the CD-rom for?

III. Make all types of questions to the following sentence:

you communicate with your computer with the keyboard.

IV. Give Uzbek equivalents:

power supply, to go haywire, specialized key, mouse pad, pointer, LESSON characters, eye strain, to reduce wear, hard disk drive, software, to save, tray, earphones.

V. Write out five sentences with Present Simple and translate them.

VI. Match up:

power guidelines
system the computer
to power up attention to
information to be device
instruction in megabytes
ready-made into the jack
to pay unit
TV-like processed and stored
to follow supply
to be measured manuals
to plug earphones mouse pad

VII. Put the verbs into the correct tense form:

1. One of the functions of the case (to be) to keep electromagnetic emissions inside when you power up the computer.

2. The function of each key (to be) described in the

instruction manual.

3. Why it (to be) better to use a mouse pad?

4. LESSON characters and graphics (to be) displayed on the monitor.

5. Number and size of pixels (to affect) the sharpness of the picture.

6. Screen savers (to help) to reduce wear on the screen.

7. Quite often the hard drive (to be) called drive C:.

8. You (can) read from CD-ROM, but you (not can) save anything to it.

VIII. Fill in the blanks:

to format, to reduce eye strain, specialized keys, to plug earphones, resolution, data, to press the Eject button.

1. If you want to listen to a music CD you can ... into the jack.

2. When you want to operate the drive, you must ... to open the tray.

3. Hard drives usually contain a lot of ...

4. Before placing a brand new diskette into the drive you have to ... it first.

5. To ... turn the monitor away from the windows and bright lights.

6. ... depends on the number of pixels.

7. A keyboard has got many ...

IX. Translate:

1. Don't remove the case's cover unless you need to do something inside the unit, and always replace the cover when you are done.

2. With a keyboard, you type instructions and commands for the computer, and information to be processed and stored.

3. You will see the arrow on your screen moving in unison.

4. The pointer moves, dragging the element.

5. The image that you see is made up of tiny dots called pixels.

6. Floppy drives provide a way to pass files to and from the hard drive or to and from another computer.

X. Give summary of the above LESSON.

LESSON 10

I. Read and translate the text.

A computer for scuba divers will provide in one device information about time, depth and air supply. It is to be used together with special divers' tables. A display will provide visual information and audible warnings about critical conditions.

If a diver wants to know an accurate depth he is down, he must set water type he is in. If he is in the sea, he will set «sea water», otherwise he will set «fresh water». The device shows the diver's current depth in meters and the level of power left in the batteries. It will indicate if the level is low, medium or high.

If a diver wants to know how long he has been down, he can see this from the display. If a diver needs to spend some minutes at a certain depth for decompression, he will start his stop watch, and will wait until the time has elapsed (passed). If a diver wants to know the amount of air left in the tank, he can see this from the contents display.

A warning signal tells him when he must start his ascent. Before he descends, the diver sets the time to ascend. If he began his ascent before the display started flashing, he would be within safe limits. If he did not ascend then, he would expose himself to decompression sickness. If he started his ascent and went up too quickly, he would see a warning light «Too fast». Then he should slow down his ascent.

ASSIGNMENT TO LESSON 10.

II. Answer the following questions:

1. What will a computer for scuba divers provide?
2. What will a display provide?
3. How will the diver estimate the depth?
4. What will the diver know the amount of air in the tank?
5. In what case will the diver expose himself to decompression sickness?

III. Make all types of questions to the following sentence:

a computer for scuba divers will provide in one device information about time, depth and air supply.

IV. Give Uzbek equivalents:

display, visual information, audible warning, fresh water, current depth, to be down, stop watch, warning signal, ascent, descent, be within safe limits.

V. Write out sentences with subordinate clauses of condition and translate them.

VI. Give summary of the above LESSON.

LESSON 11

OPTICAL TECHNOLOGY

One of the most interesting developments in telecommunication is the rapid progress of optical communication where optical fibers are replacing conventional telephone wires and cables. Just as digital technologies greatly improved the telephone system, optical communication promises a considerable increase in capacity, quality, performance and reliability of the global telecommunication network. New technologies such as optical fibers will increase the speed of telecommunication and provide new, specialized information service. Voice, computer data, even video images, will be increasingly integrated into a single digital communication network capable of processing and transmitting virtually any kind of information.

It is a result of combining two technologies: the laser, first demonstrated in 1960, and the fabrication 10 years later of ultra-thin silicon fibres which can serve as lightwave conductors. With the further development of very efficient lasers plus continually improved techniques to produce thin silica fibres of incredible transparency, optical systems can transmit pulses of light as far as 135 kilometers without the need for amplification or regeneration.

At present high-capacity optical transmission systems are being installed between many major US cities at a rapid rate. The system most widely used now operates at 147 megabits per second and accommodates 6,000 circuits over a single pair of glass fibres (one for each direction of transmission). This system will soon be improved to operate at 1.7 gigabits per second and handle 24,000 telephone channels simultaneously.

A revolution in information storage is underway with optical disk technology.

The first digital optical disks were produced in 1982 as

compact disks for music. They were further developed as a storage medium for computers. The disks are made of plastics coated with aluminium. The information is recorded by using a powerful laser to imprint bubbles on the surface of the disk. A less powerful laser reads back the pictures, sound or information. An optical disk is almost indestructible and can store about 1000 times more information than a plastic disk of the same size.

One CD-ROM disk (650 MB) can replace 300,000 pages of LESSON (about 500 floppies), which represents a lot of savings in databases.

The future of optical storage is called DVD (digital versatile disk). A

DVD-ROM can hold up to 17 GB, about 25 times an ordinary CD-ROM.

For this reason, it can store a large amount of multimedia software and complete full-screen Hollywood movies in different languages. However, DVD-ROMs are «read-only» devices. To avoid this limitation, companies also produce DVD rewritable drives.

Besides, it is reported that an optical equivalent of a transistor has been produced and intensive research on optical electronic computers is underway at a number of US companies as well as in countries around the world.

It is found that optical technology is cost-effective and versatile. It finds new applications every day - from connecting communication equipment or computers within the same building or room to long distance transcontinental, transoceanic and space communications.

ASSIGNMENT TO LESSON 11.

I. Read and translate the text.

II. Answer the following questions:

1. Which is one of the most interesting developments in telecommunication nowadays? 2. What does optical communication promise? 3. What are the capabilities of optical fibers? 4. What are the perspectives of optical fibers? 5. Why is the system developing rapidly now? 6. What are the advantages of using compact discs? 7. How much information can a DVD-ROM hold? 8. Where can optical technology be used?

III. Make all types of questions to the following sentence:

the first digital optical disks were produced in 1982 as compact disks for music.

IV. Give English equivalents:

обычные телефонные провода и кабели, цифровые технологии, надежность, объединять в одно целое, проводник световых волн, усиление, устанавливать, развивать, представлять собой, оптико-электронный компьютер, рентабельный,

V. Give Russian equivalents:

capacity, computer data, transmitting information, ultra-thin silicon fibres, incredible transparency, regeneration, optical disk technology, coated, database, multimedia software, rewritable drive, cost-effective, application.

VI. Match up:

optical.....conductors

conventional bubbles
silicon..... medium
lightwave communication
storage software
to imprint telephone wires and cables
multimedia..... fibres

VII. Put the verbs into the correct tense form:

- In the nearest future digital communication network (to allow) to process and transmit voice, computer data and video images.
- Invention of the laser and thin silicon fibres (to make) it possible to transmit pulses of light without amplification and regeneration.
- New high-capacity optical transmission systems (to operate) between many major US cities.
- Another revolution (to concern) optical disk technology.
- An optical disk (to be) capable of storing about 1000 times more information than a plastic disk of the same size.

VIII. Fill in the blanks:

gigabits, digital communication network, cost-effective and versatile, high-capacity optical transmission systems, transistor, digital technologies, coated, information storage.

- Just as ... greatly improved the telephone system, optical communication promises a considerable increase in capacity, quality, performance and reliability.
- Voice, computer data, even video images, will be increasingly integrated into a single
- At present ... are being installed between many major US cities at a rapid rate.
- This system will soon be improved to operate at ... per second.
- A revolution in ... is underway with optical disk

technology.

6. The disks are made of plastics ... with aluminium.
7. It is reported that an optical equivalent of a . has been produced.
8. It is found that optical technology is . .

IX. Put in the right proposition:

1. You communicate with your computer ... the keyboard.
2. The instruction manuals ... most software applications contain a section describing the functions ... each key.
3. The mouse works ... sliding it around (ball down) ... a flat surface.
4. You will see the arrow ... your screen moving ... unison.
5. That's the only part the computer pays attention
6. Your computer is not complete ... the monitor.
7. The sharpness ... the picture depends ... the number and size ... these pixels.
8. Some ... the controls ... the monitor change the size and position ... the image.
9. Windows includes a number ... screen savers.
10. The drives can read and write ... floppy diskettes.
11. The amount and variety ... material you can access ... CD-ROM is amazing.
12. If a diver wants to know an accurate depth he is down, he must set water type he is... .
13. If a diver wants to know how long he has been down, he can see this ... the display.
14. Before he descends, the diver sets the time ... ascend.
15. Optical communication promises a considerable increase ... capacity, quality, performance and reliability ... the global telecommunication network.
16. The system most widely used now operates ... 147 megabits (thousand bits) per second.
17. The first digital optical disks were produced ... 1982 as

compact disks ... music.

18. The information is recorded ... using a powerful laser to imprint bubbles . the surface ... the disk.

X. Give summary of the above LESSON.

LESSON 12

An Encyclopedia on a Tiny Crystal

Scientists have discovered that a laser beam can be effectively used to record alphanumeric data and sound on crystals. According to Russian researchers a method for recording information on crystals by means of a laser has already been developed, but advanced technologies are needed to make it commercially applicable.

At present researchers are looking for the most suitable chemical compounds to be used as data storages and trying to determine optimum recording conditions. Theoretically, the entire «Great Soviet Encyclopedia» can be recorded on a single tiny crystal.

As far back as 1845, Michael Faraday discovered that a light beam reverses its polarization as it passes through a magnetized crystal. Scientists of our day have used this phenomenon to identify crystalline materials capable of storing information. Lasers have been successfully employed to record information on and read it off.

No ideal data storage crystal has yet been found, but it is obvious now that the future of computer engineering lies in lasers and optoelectronics.

ASSIGNMENT TO LESSON 12.

I. Read and translate the text.

II. Answer the following questions:

1. What have scientists discovered? 2. What method has been developed according to Russian scientists? 3. What are researchers looking for at present? 4. What did M. Faraday discover long ago and how is the phenomenon used nowadays?

III. Make all types of questions to the following sentence:

according to Russian researchers a method for recording information on crystals by means of a laser has already been developed.

IV. Give Russian equivalents:

ideal data storage crystal, commercially applicable, by means of, to record.

V. Give summary of the above LESSON.

LESSON 13.

PROGRAMMING LANGUAGES

The only language computers can understand directly is called machine code. It is known to consist of the 1s and 0s (binary code) that are processed by the CPU. However, machine code as a means of communication is very difficult to write. That is why it is necessary to use symbolic languages that are easier to understand. Then, by using a special program, these languages can be translated into machine code.

Basic languages, in which the program is similar to the machine code version, are known as low-level languages. In these languages, each instruction is equivalent to a single machine code instruction, and the program is converted into machine code by a special program called an assembler. These languages are considered to be still quite complex and restricted to particular computers.

To make the program easier to write and to overcome the problem of intercommunication between different types of machines, higher-level languages were developed such as BASIC, COBOL, FORTRAN, Pascal, Ada, C and others. A higher-level language is a problem oriented programming language, whereas a low-level language is machine oriented. This means that a high-level language is a convenient and simple means of describing the information structures and sequences of actions to be performed for a particular task.

A high-level language is independent of the architecture of the computer which supports it. This has two advantages. Firstly, the person writing the program does not have to know anything about the computer the program will be run on. Secondly, programs are portable, that is, the same program can (in theory) be run on different types of computers. Programs written in one of these languages should be converted by means of a compiler into a lower-level language or machine code so

that the CPU could understand it.

C, a high-level programming language, seems to be very popular today because it is small, so it is not too hard to learn, it is very efficient and portable so one can use it with all kinds of computers. A lot of software engineers use C to write commercial applications programs for mini, micro and personal computers. There are also various versions of C - C++ and Objective C, which represent a new style of programming.

At present there is a tendency towards an even higher level of programming languages, which might be called specification languages, and an increasing use of software development tools.

People communicate instructions to the computer in symbolic languages and the easier this communication can be made, the wider the application of computers will be. Scientists are reported to be already working on Artificial Intelligence and the next generation of computers may be able to understand human languages.

ASSIGNMENT TO LESSON 13.

I. Read and translate the text.

II. Answer the following questions:

1. How is the language that computers understand called?
2. Why is it necessary to use symbolic languages?
3. What is a low-level language?
4. Why aren't they suitable for all computers?
5. How is the program that converts instructions into machine code called?
6. What are high-level languages called?
7. What is the difference between a low-level and a high-level language?
8. What are the advantages of a high-level language?
9. What is a high-level language converted into machine code with?
10. Why is C, a high-level programming language, most popular nowadays?
11. What is the tendency today?
12. What are scientists working at the present?

III. Make all types of questions to the following sentence:

there are also various versions of C - C++ and Objective C, which represent a new style of programming.

IV. Give Russian equivalents:

specification languages, commercial applications programs, efficient and portable, a problem oriented programming language, to be converted, CPU, machine code.

V. Match up:

means of.....into
a low-level.....development tools
to be converted.....communications
machine.....language
to be run.....intelligence
software.....oriented
artificial on

VI. Put the verbs into the correct tense form:

- a. The only language computers understand (to be) machine code.
- b. Low-level languages (to correspond) to the machine code version.
- c. Which languages (to be considered) to be complex and restricted to particular computers?
- d. A compiler (to serve) to convert a high-level language into a lower-level one.
- e. Usually engineers (to use) C to write commercial applications programs for mini, micro and personal computers.

VII. Fill in the blanks:

compiler, programmed, program, assembler, language,

programmers, portable, low-level.

1. A computer ... is a set of instructions that tells the computer what to do.
2. Most computer ... make a plan of the program before writing it.
3. Coding is the translation of the logical steps into a programming
4. In the next century computers will be ... in natural languages like English or French.
5. A ... is a special program that converts a program written in a high-level language into a program written in a lower level language.
6. A special program called ... converts a program written in a low-level language into machine code.
7. If the same program can be used for different computers, it is called
8. In a ... language each instruction has a corresponding machine code equivalent.

V111. Give summary of the above LESSON.

LESSON 14.

THE INTERNET

The Internet is a magnificent global network with millions and millions of computers and people connected to one another where each day people worldwide exchange an immeasurable amount of information, electronic mail, news, resources and, more important, ideas.

It has grown at a surprising rate. Almost everyone has heard about it and an increasing number of people use it regularly. The current estimate is that over 70 million people are connected, in some way, to the Internet - whether they know it or not.

With a few touches at a key board a person can get access to materials in almost everywhere. One can have access to full-LESSON newspapers, magazines, journals, reference works, and even books. The Web is one of the best resources for up-to-date information. It is a hype LESSON-based system by which you can navigate through the Internet. Hyper LESSON is the LESSON that contains links to other documents. A special program known as «browser» can help you find news, pictures, virtual museums, electronic magazines, etc. and print Web pages. You can also click on keywords or buttons that take you to other pages or other Web sites. This is possible because browsers understand hyper LESSON markup language or code, a set of commands to indicate how a Web page is formatted and displayed.

Internet Video conferencing program enable users to talk to and see each other, exchange LESSON and graphical information, and collaborate.

Internet TV sets allow you to surf the Web and have e-mail while you are watching TV, or vice versa. Imagine watching a film on TV and simultaneously accessing a Web site where you get information on the actors of the film. The next generation

of Internet-enabled televisions will incorporate a smart-card for home shopping, banking and other interactive services. Internet-enabled TV means a TV set used as an Internet device.

The Internet is a good example of a wide area network (WAN). For long-distance or worldwide communications computers are usually connected into a wide area network to form a single integrated network. Networks can be linked together by telephone lines or fibre-optic cables. Modern telecommunication systems use fibre-optic cables because they offer considerable advantages. The cables require little physical space, they are safe as they don't carry electricity, and they avoid electromagnetic interference.

Networks on different continents can also be connected via satellites. Computers are connected by means of a modem to ordinary telephone lines or fibre-optic cables, which are linked to a dish aerial. Communication satellites receive and send signals on a transcontinental scale.

ASSIGNMENT TO LESSON 14.

I. Read and translate the text.

II. Answer the following questions:

1. What is the Internet and what is it for? 2. How many people are connected to the Internet at present? 3. What are the advantages of the Internet? 4. How does it function? 5. What other services does the Internet offer? 6. What is an Internet-enabled TV set and how it can be used in the nearest future? 7. What is WAN? 8. How are the networks connected with each other?

III. Make all types of questions to the following sentence:

the next generation of Internet-enabled televisions will

incorporate a smart-card for home shopping, banking and other interactive services.

IV. Give Russian equivalents:

magnificent global network reference works, exchange LESSON and graphical information, smart-card, single integrated network.

V. Match up:

dishaccess
to be connected information
electromagnetic..... through
worldwide.....markup language
wide area.....information
to get.....via
hyper LESSONcommunications
to navigateinterference
up-to-date.....network
to get.....aerial

VI. Put the verbs into the correct tense form:

1. In the last decade the Internet (to grow) at a surprising rate.
2. With the help of the Web you (to be able) to get access to different information resources.
3. Getting access to different sites (to be) done with the help of a special program known as "browser".
4. In a few years Internet-enabled TV sets (to be) used extensively.
5. What type of cables (to be) telecommunication systems connected with?

VII. Fill in the blanks:

exchange LESSONual and graphical information, worldwide communications, be connected via, dish aerial, single integrated network, get access, up-to-date information, smart-card.

1. Computers are connected by means of a modem to ordinary telephone lines or fibre-optic cables, which are linked to a ...
2. The next generation of Internet-enabled televisions will incorporate a ... for home shopping, banking and other interactive services.
3. Internet Video conferencing programs enable users to talk to and see each other, ..., and collaborate.
4. Networks on different continents can also ... satellites.
5. For long-distance or, ... computers are usually connected into a wide area network to form a ..
6. The Web is one of the best resources for
7. With a few touches at a keyboard a person can ... to materials in almost everywhere.

VIII. Translate:

1. The Internet is a magnificent global network with millions and millions of computers and people connected to one another where each day people worldwide exchange an immeasurable amount of information, electronic mail, news, resources and, more important, ideas.
2. Hyper LESSON is the LESSON that contains links to other documents.
3. Internet Video conferencing programs enable users to talk to and see each other, exchange LESSONual and graphical information, and collaborate.
4. The next generation of Internet-enabled televisions will incorporate a smart-card for home shopping, banking and other interactive services.
5. Computers are connected by means of a modem to

ordinary telephone lines or fibre-optic cables, which are linked to a dish aerial.

IX. Give summary of the above LESSON.

LESSON 15

OPTICAL DISKS AND DRIVES

Optical disks can store information at much higher densities than magnetic disks. Thus, they are ideal for multimedia applications where images, animation and sound occupy a lot of disk space. Besides, they are not affected by magnetic fields. This means that they are secure and stable, e.g. they can be transported through airport metal detectors without damaging the data. However, optical drives are slower than hard disks. While there are hard drives with an average access time of 8 milliseconds (ms), most CD-ROM drives have an access time of 150 to 20 ms.

There are various types of optical drives, which have become a reality. CD-ROM systems use optical technology. The data is rewritable using a laser beam. To read CD-ROM disks, you need an optical drive (a CD-ROM player). A typical CD-ROM disk can hold 650 MB (megabytes) of sound, LESSON, photographs, music, multimedia materials and applications. In addition, most CD-ROM drives can be used to play audio CDs. Do you remember that CD stands for compact disk?

Yet CD-ROM technology has one disadvantage. The data on a CD-ROM cannot be changed or «written» to, i.e. it is impossible to add your own material to what is on the disk. It is like a music CD. It is not designed for you to write on, it is designed to hold a lot of information that the user doesn't need to change.

Magneto-optical (MO) drives use both a laser and an electromagnet to record information. Consequently, MO disks are rewritable, that is they can be written to, erased, and then written again. They are available in two formats. Their capacity may be more than 2 GB (gigabyte) or 230 to 640 MB. Such combined devices are good for back up purposes and storage of large amounts of information such as a dictionary or encyclopaedia.

ASSIGNMENT TO LESSON 15.

I. Read and translate the text.

II. Answer the following questions:

1. What can optical disks be used for? 2. What are their advantages and disadvantages? 3. How can data be retrieved from a CD? 4. What are CDs designed for and their disadvantage? 5. What is the other type of disks and what is their capacity?

III. Make all types of questions to the following sentence:

there are various types of optical drives, which have become a reality.

IV. Give Uzbek equivalents:

Rewritable, secure, density, multimedia materials, consequently, optical drives.

V. Match up:

to store data
to be affected for
to damage information
to stand purpose
back up by

VI. Put the verbs into the correct tense form:

1. Optical disks (to serve) to store information.
2. Airport metal detectors (to damage) the data on the disk?
3. CDs (to hold) 650 MB or 2 GB?
4. How (to be) rewritable disks called?

VII. Put in the right proposition:

1. Machine code consist . the 1s and 0s (binary code) that are processed . the CPU.

2. Low-level languages are converted . machine code . a special program called an assembler.

3. Any high-level language is independent . the computer the program will be run . .

4. C, a high-level programming language, can be used . all kinds of computers.

5. In the Internet millions .. computers are connected ... one another.

6. The Internet is growing . a surprising rate.

7. Hyper LESSON is the LESSON that contains links . other documents.

8. To surf in the Internet you can also click . keywords.

9. Special program allow people . talk . each other in the Web.

10. Networks can be linked together . telephone lines or fibre-optic cables.

11. Optical disks are ideal . multimedia applications.

12. When you pass . airport metal detectors Optical disks are not affected . magnetic fields.

13. CDs are not designed ... you ... write

VIII. Give summary of the above LESSON.

LESSON 16.

COMPUTER GRAPHICS

Computer graphics are pictures and drawings produced by computers. A graphics program interprets the input provided by the user and transports it into images that can be displayed on the screen, printed on paper or transferred to microfilm. In the process the computer uses hundreds of mathematical formulas to convert the bits of data into precise shapes and colours. Graphics can be developed for a variety of uses including illustrations, architectural designs and detailed engineering drawings.

Mechanical engineering uses sophisticated programs for applications in computer-aided design (CAD) and computer-aided manufacturing (CAM). In the car industry CAD software is used to develop, model and test car designs before the actual parts are made. This can save a lot of time and money.

Basically, computer helps users to understand complex information quickly by presenting it in more understandable and clearer visual forms. Electric engineers use computer graphics for designing circuits and in business it is possible to present information as graphics and diagrams. These are certain to be much more effective ways of communicating than lists of figures or long explanations.

Today, three-dimensional graphics along with colour and computer animation are supposed to be essential for graphic design, computer-aided engineering (CAE) and academic research. Computer animation is the process of creating objects and pictures which move across the screen; it is used by scientists and engineers to analyze problems. With appropriate software they can study the structure of objects and how it is affected by particular changes.

A graphic package is the software that enables the user to draw and manipulate objects on a computer. Each graphic

package has its own facilities, as well as a wide range of basic drawing and painting tools. The collection of tools in a package is known as a palette. The basic geometric shapes, such as lines between two points, arcs, circles, polygons, ellipses and even LESSON, making graphical objects are called "primitives". You can choose both the primitive you want and where it should go on the screen. Moreover, you can specify the «attributes» of each primitive, e.g., its colour, line type and so on. The various tools in a palette usually appear together as pop-up icons in a menu. To use one you can activate it by clicking on it.

After specifying the primitives and their attributes you must transform them. Transformation means moving or manipulating the object by translating, rotating and scaling the object.

Translation is moving an object along an axis to somewhere else in the viewing area. Rotation is turning the object larger or smaller in any of the horizontal, vertical or depth direction (corresponding to the x, y and z axis). The term «rendering» describes the techniques used to make your object look real. Rendering includes hidden surface removal, light sources and reflections.

ASSIGNMENT TO LESSON 16

I. Read and translate the text.

II. Answer the following questions:

1. What is computer graphics?
2. How does a computer interpret the command?
3. Where is computer graphics used?
4. In what way does computer graphics help people?
5. What is computer animation and how does it help scientists and engineers?
6. What does a graphic package include?
7. What are "primitives" and how can they be used?

III. Make all types of questions to the following sentence:

A graphics program interprets the input provided by the user and transports it into images.

IV. Give Russian equivalents:

Graphics program, computer-aided design, computer-aided manufacturing, circuits, to analyze problems, appropriate software, polygon.

V. Match up:

pop-upin
to be essentialon
three-dimensional a lot of time
visualgraphics
to presenticons
to convertforms
computer into
to be displayed..... for
to save..... graphics

VI. Write out five sentences with Present Simple and translate the predicate.

VII. Pick out the right definition:

1. Computer graphics are ...
 - a) LESSONs;
 - b) pictures and drawings;
 - c) digits.
2. Computers use to convert data into shapes and colours.
 - a) words;
 - b) pictures;
 - c) mathematical formulas.

3. Computer animation is the process of creating . which move across the screen

- a) objects and pictures;
- b) mathematical formulas;
- c) books.

4. The collection of tools in a package is known as ..

- a) palette;
- b) polygon;
- c) palate.

5. . are called "primitives".

- a) the digits;
- b) the basic geometric shapes;
- c) the letters.

6. The various tools in a palette usually appear together as ... in a menu.

- a) pop-up corks;
- b) pop-up letters;
- c) pop-up icons.

VIII. Put the verbs into the correct tense form:

1. Computer graphics (represent) pictures and drawings produced by computers.

2. To produce images that (can) be displayed on the screen the computer (to use) hundreds of mathematical formulas.

3. Computers (to help) in CAD and CAM to save time and money.

4. In business computers (to be used) to present information as graphics and diagrams.

5. With the help of computer animation scientists and engineers (to analyze) problems.

6. What a graphic package (to enable) the user to draw?

IX. Give summary of the above LESSON.

LESSON 17

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 became possible due to electronics.

The invention of vacuum tubes at the beginning of the 20th 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 solid 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 describe components on a chip one at a time, large groupings of these components together with their interconnections were made all at a time. IC greatly reduced the size of devices, lowered manufacturing costs and at the same time they provided high speed and increased reliability.

ASSIGNMENT TO LESSON 17

I. Read and translate the text.

II. Answer the following questions:

1. What is electronics?
2. Can you imagine modern life without electronics?
3. Where are electronic devices used?
4. What was the 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 transistors have over the vacuum tubes?

III. Find the meaning of the following words and combinations

Electronics; electrons; physics; information; microelectronics; industrial design; to calculate trajectories; phenomena of nature; automatization of production processes; organisms; vacuum tubes; specialized functions; progress in radio communication technology; transistor; electrode; components; to realize; communication system; technology; discrete components; chip.

LESSON 18

MICROELECTRONICS AND MICROMINIATURIZATION

The intensive effort of electronics to increase the reliability and performance of its products while reducing their size and cost led to the results that hardly anyone could predict. 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. It includes 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.

One more advantage of microelectronics is that smaller devices consume less power. In space satellites and spaceships this is a very important factor.

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 circuits, microwave integrated circuit. The evolution of microwave IC began with the development of planar transmission lines. Then new IC components in a fine line transmission line appeared.

Other more exotic techniques, such as dielectric waveguide integrated circuits emerged.

Microelectronic technique is continuing to displace other modes. Circuit patterns are being formed with radiation having wavelength shorter than those of light.

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

ASSIGNMENT TO LESSON 18.

I. Read and translate the text.

II. Answer the following questions:

1. What would you say about electronics?
2. Why is the development of electronics called a revolution?
3. What is microelectronics?
4. What techniques does microelectronics use?
5. What is the benefit of reducing the size of circuit elements?
6. What do you understand by the term of microminiaturization?
7. What does the speed of the signal response depend on?
8. What advantages of microelectronics do you know?
9. What scales of integration are known to you?
10. How are microelectronics techniques developing?

III. Translate the following words.

dis-: disadvantage; disconnect; disappear; disclose; discomfort; discontinue; discount; discredit; discriminate; disintegrate.

in-: invisible; inaccurate; inactive; incapable; incompact; insignificant; inhuman; informal; ineffective; indifferent; indecisive; inconsumable; incorrect.

un-; uncontrollable; unbelievable; unable; unchanged; uncomfortable; uncommunicative; undisciplined; unexpected; unfavourable; unforgettable; unkind.

non-: non-effective; non-aggressive; noncomparable; non-computable; nonconstant; noncontrollable; nondigital; nondimensional; nonprogrammable; nonusable.

ir-; irregular; irrelative; irresponsible; irrational; irreplaceable; irrecognizable.

TEST. Fill in the blanks

1. _____ Transistors 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. _____ T h e
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. _____ One 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) dimensions

MATHEMATICAL TERMS

№	English term	O'zbekcha atama	Термин на русском
1	absolute value	absolyut qiymat	абсолютное значение
2	absolute value function	modulli funktsiya	модульная функция
3	absolute value of vector	vektorning absolyut qiymati	модуль вектора
4	acceleration	tezlanish	ускорение
5	acute angle	o'tkir burchak	острый угол
6	acute-angle triangle	o'tkir burchakli uchburchak	остроугольный треугольник
7	add	qo'shmoq	складывать
8	addend	qo'shiluvchi	слагаемое
9	adjacent angles	qo'shni burchaklar	соседние углы
10	algebraic expression	algebraik ifoda	алгебраическое выражение
11	alternate angles	ichki almashinuvchi burchaklar	внутренние накрест лежащие углы
12	altitude	balandlik	высота аналитический метод
13	analytical method of solution	analitik yechish usuli	аналитический решения
14	angle	burchak	угол
15	anti-differential function	boshlang'ich funktsiya	первообразная функция
16	apothem	apofema	апофема
17	approximate	taqribiy, taxminiy	приблизительный
18	arc	yoy	дуга
19	arctangent	arktangens	арктангенс
20	area of a figure	figuraning yuzi	площадь фигуры
21	arithmetic mean	arifmetik o'rta qiymat	арифметическое среднее значение
22	arithmetic operation	arifmetik amal	арифметическое, действие (операция)
23	arithmetic progression	arifmetik progressiya	арифметическая прогрессия

24	ascending order	o'sish tartibi	возрастающий порядок
25	asymptote	assimptota	асимптота
26	average	o'rta qiymat	среднее значение
27	axial section	o'q kesim	осевое сечение
28	be equivalent to	teng kuchli	быть равносильным
29	be identical to be located	aynan o'xshamoq	быть тождественным
30	(situated) at	joylashmoq	находиться, располагаться
31	billion	milliard	миллиард
32	binomial	ikkihad	миллиард
33	biquadratic	bikvadrat	двучлен биквадрат
34	bisector brackets (parentheses)	bissektrisa qavslar	биссектриса скобки
35	bring to the same base	birxil asosha keltirish	приводить к общему основанию
36	cancel	qisqartirish, yo'qotish	сокращать
37	cartesian system	dekart koordinatalar	декартова система
38	of coordinates center	sistemi markaz	координат центр
39	characteristic point	xarakteristik nuqta	характеристическая точка
40	chord	vatar	хорда
41	chord subtends an arc	vatar yoyni tortib turibdi	хорда стягивает дугу
42	circle	doira	круг
43	circumference	aylana	окружность
44	circumscribe	tashqi chizmoq	описывать
45	circumscribed angle	tashqi chizilgan burchak	описанный угол
46	coefficient	koeffitsient	коэффициент
47	collect like terms	o'xshash hadlarni qo'shmoq	собирать подобные
48	collinear vector common	ixchamlamoq kollinear vektor	члены коллинеарный вектор
49	difference of arithmetic progression	arifmetik progressiya ayirmasi	разность арифметической прогрессии

50	common factor	umumiy ko'paytuvchi	общий множитель
51	common logarithm	o'nli logarifm	десятичный логарифм
52	complementary angle	to'ldiruvchi burchak	дополнительный угол
53	complete a table	jadvalni to'ldiroq	заполнять таблицу
54	composite number	murakkab son	составное число
55	composite function	murakkab funktsiya	сложная функция
56	compute, calculate	hisoblamog	вычислить
57	concave polygon	botiq ko'pburchak	вогнутый многоугольник
58	concept	tushuncha	понятие, концепция
59	condition	shart	условие
60	cone	konus	конус
61	consecutive	ketma-ket	последовательный
62	constant	konstanta, o'zgarmas	константа, постоянное
63	constraint	cheklov	ограничение, ограничивающее
64	convert	almashtirmog	условие переводить, менять
65	convex polygon	qavariq ko'pburchak	выпуклый многоугольник.
66	coordinate	koordinata	координата
67	coordinate system	koordinatalar sistemasi	система координат
68	corner	uch, burchak	вершина
69	cosine	kosinus	косинус
70	cotangent	kotangens	котангенс
71	create a table	jadval tuzish	создавать таблицу
72	critical point crossing point	kritik nuqta kesishish nuqtasi	критическая точка точка пересечения
73	cross-multiply	diagonal bo'yicha ko'paytirmog	умножать по диагонали
74	cube	kub	куб
75	curve	egri chiziq	кривая
76	cylinder	tsilindr	цилиндр
77	data	ma'lumotlar	данные .

78	decimal fraction	o'nli kasr	десятичная дробь
79	decimal point (place)	o'nli nuqta (xona)	десятичная точка (место)
80	definite integral	aniq integral	определенный интеграл
81	degree	da raj a	градус
82	degree (power, polynomial) function	darajali funktsiya	степенная функция
83	denominator	mahraj	знаменатель
84	denote	belgilamog	обозначать
85	derivative	hosila	производная
86	descending order	kamayish tartibi	убывающий порядок
87	diagram	chizma, diagramma	диаграмма
88	diameter	diametr	диаметр
89	difference	ayirma, farq	разность
90	differential	differentsial	дифференциал
91	differentiate	hosila olmog	дифференцировать
92	digit	raqam	цифра
93	dimension	o'lchov	мера, измерение
94	direct proportion	to'g'ri nisbat	прямая пропорциональность
95	discriminant	diskriminant	дискриминант
96	divide	bo'lmoq	делить
97	double (triple) product	ikkilangan (uchlangan) ko'paytma	удвоенное (утроенное) произведение
98	double inequality	ikkitali tengsizlik	двойное неравенство
99	draw a graph	grafik chizish	начертить график
100	drop an altitude	balandliktushirmog	проводить высоту
101	edge	qirra	ребро
102	element	element	элемент
103	elementary function	elementar funktsiya	элементарная функция
104	empty set	bo'sh to'plam	пустое множество

105	equal to	teng bo'lmoq	равняться
106	equality	tenglik	равенство
107	equate	tenglamoq	приравнивать
108	equation	tenglama	уравнение
109	equilateral triangle	teng tomonli uchburchak	равносторонний треугольник
110	equivalent equation	teng kuchli tenglama	равносильное уравнение
111	evaluate, estimate	baho barmoq	оценивать
112	even function	juft funktsiya	четная функция
113	even number	juft son	четное число
114	expand brackets	qavslarni ochish	раскрывать скобки
115	exponential function	ko'rsatkichli funktsiya	показательная функция
116	express	ifodalamoq	выражать
117	extract a (square) root	(kvadrat) ildiz chiqarish	извлекать (квадратный) корень
118	extreme value	extremum	экстремум
119	face (side)	yoq (tomon)	грань
120	factor	ko'paytuvchi	множитель
121	fifth root	beshinchi darajali ildiz	корень пятой степени
122	figure	figura, qiymat	фигура, значение
123	form	shakl, tahsil qilmoq	форма, образовывать
124	formula	formula	формула
125	formula of addition	qo'shish formulasi	формула сложения
126	formula of doubled argument	ikkilangan burchak formulasi	формула двойного угла
127	formula of halved argument	yarim burchak formulasi	формула половинного угла
128	formula of reduction formula of	keltirish formulasi yig'indini (ayirmani)	формула приведения формула
129	transformation of sums (differences) into a product	ko'paytmaga almashtirish formulasi	преобразования суммы (разности) в произведения

130	function argument	funktsiya argumenti	аргумент функция
131	function domain	funktsiyaning aniqlanish sohasi	область определения функции
132	function range	funktsiyaning qiymatlar sohasi	область значения функции
133	general solution	umumiy yechim	общее решение
134	generator	yasovchi	образующая
135	geometric mean	geometrik o'rta qiymat	геометрическое среднее значение
136	geometric progression	geometrik progressiya	геометрическая прогрессия
137	gradient	gradiyent, burchak koeffitsienti	градиент, угловой коэффициент
138	graph of a function	funktsiya grafigi	график функции
139	graphical method of solution	grafikyechish usuli	графический метод решения
140	greater than	katta	больше
141	greater than or	katta yoki teng	больше или равно
142	equal to grid	katak, panjara	решетка
143	half as much (many) as	ikki barobar kam	два раза меньше
144	highest (greatest) common divisor (hcd)	eng katta umumiy bo'luvchi (ekub)	наибольший общий делитель (нод)
145	horizontal axis	gorizontal o'q	горизонтальная ось
146	hyperbola	giperbola	гипербола
147	hypotenuse	gipotenuza	гипотенуза
148	identical equation (identity)	ayniyat	тождество
149	identify	aniqlamoq	определять
150	identity	ayniyat	тождество
151	imply	anglatmoq, kelib chiqmoq	означать, следовать
152	improper fraction	noto'g'ri kasr	неправильная
153	in terms of	orqali	через
154	incomplete quadratic equation	chala kvadrat tenglama	неполное квадратное уравнение

155	incomplete square of a difference (sum)	chala kvadrat ayirma (yig'indi)	неполный квадрат разности (суммы)
156	increasing (decreasing) progression	o'suvchi (kamayuvchi) progressiya	возрастающая (убывающая) прогрессия
157	increasing and decreasing function	o'suvchi va kamayuvchi funktsiya	возрастающая и убывающая функции
158	indefinite integral	noaniq integral	неопределенный интеграл
159	index (degree) of a root	ildiz ko'rsatkichi	показатель корня
160	indicate	ko'rsatmoq, belgilanmoq	обозначать, указывать
161	inequality	tengsizlik	неравенство
162	inequality sign	tengsizlik ishorasi	знак неравенства
163	infinite solutions	cheksiz ko'p yechim	бесконечно много решений
164	infinitely descending geometric progression	cheksiz kamayuvchi geometrik progressiya	бесконечно убывающая геометрическая прогрессия
165	infinity	cheksizlik	бесконечность
166	inscribe	ichki chizmoq	вписывать
167	inscribed angle	ichki chizilgan burchak	вписанный угол
168	instruction	ko'rsatma, yo'riq	инструкция
169	integer	butun	целое
170	integral function	boshlang'ich funktsiya	первообразная функция
171	integration	integral	интегрирование
172	integration by parts	bo'laklab integrallamoq	интегрирование по частям
173	integration by substitution	o'rniga qo'yish orqali integrallamoq	интегрирование подстановкой
174	internal angle	ichki burchak	внутренний угол
175	inverse function	teskari funktsiya	обратная функция
176	inverse proportion	noto'g'ri nisbat	обратная пропорциональность

177	inverse trigonometric function	teskari trigonometrik funktsiya	обратная тригонометрическая функция
178	irrational function	irratsional funktsiya	иррациональная функция
179	irrational number	irratsional son	иррациональное число
180	irregular component	noregulyar omil	нерегулярный компонент
181	isosceles triangle	teng yonli uchburchak	равнобедренный треугольник
182	label	belgilamoq	обозначать
183	left-hand side	chap tomon	левая сторона
184	leftmost	eng chapki	крайний слева
185	length	uzunlik, bo'yi	длина
186	less than	kichik	меньше
187	less than or equal to	kichik yoki teng	меньше или равно
188	line segment	kesma	отрезок
189	linear equation	chiziqli tenglama	линейное уравнение
190	linear inequality	chiziqli tengsizlik	линейное неравенство
191	logarithmic base	logarifm asosi	основание логарифма
192	logic	mantiq	логика
193	lowest (least) common multiple (lcm)	eng kichik umumiy ko'paytuvchi (ekuk)	наименьший общий кратный (ноч)
194	lowest common denominator	eng kichik umumiy mahraj	наименьший общий знаменатель
195	main value of an inverse trigonometric function	teskari trigonometrik funktsiyaning asosiy qiymati	главное значение обратной тригонометрической функции
196	make up an equation	tenglama tuzish	составлять уравнение
197	maximum value	maksimum qiymat	максимальное значение
198	mean difference	o'rta farq	средняя разность
199	method of elimination	noma'lumlarni yo'qotish usuli	метод исключения неизвестных
200	method of intervals	intervallar usuli	метод интервалов

201	method of successive substitutions	noma'lumlarni o'miga qo'yish usuli	метод последовательных подстановок
202	method of trial and error	taxmin qilish usuli	метод проб и ошибок
203	middle line	o'rta chiziq	средняя линия
204	minimum value	minimum qiymat	минимальное значение
205	mixed number	aralash son	смешанное число
206	modular function	modulli funktsiya	модульная функция
207	monomial	birhad	одночлен
208	monotonous function	monoton funktsiya	монотонная функция
209	multiple	karrali	кратное
210	multiply	ko'paytirmoq	умножать
211	natural (whole) exponent (power, degree) of number	sonning natural (butun) darajasi	натуральная (целая) степень числа
212	natural logarithm	natural logarifm	натуральный логарифм
213	natural number	natural son	натуральное число
214	naught (0.5 reads naught point five or zero point five)	yo'q, nol (0.5 nol butun o'ndan besh deb o'qiladi)	ничто, ноль (0.5 читается как ноль целых пять десятых)
215	negative number	manfiy son	отрицательное число
216	negative sign	manfiy ishora	отрицательный знак числа, знак минус
217	nonlinear equation	nochiziqli (chiziqli bo'lmagan) tenglama	нелинейное уравнение
218	nonlinear inequality	chizizli bo'lmagan tengsizlik	нелинейное неравенство
219	nonnegative	nomanfiy	неотрицательный
220	nonzero	noldan farqli	отличное от нуля
221	n-th root	n-ildiz	n-й корень
222	n-th term (common term)	n-had (umumiy had)	n-й член (общий член)
223	number axis	sonlar o'qi	числовая ось

224	numerator	surat	числитель
225	numerical expression	sonli ifoda	числовое выражение
226	objective function	maqsad funktsiyasi	целевая функция
227	obtuse angle	o'tmas burchak	тупой угол
228	obtuse-angle triangle	o'tmas burchakli uchburchak	тупоугольный треугольник
229	odd function	toq funktsiya	нечетная функция
230	odd number	toq son	нечетное число
231	ordinary fraction	oddiy kasr	обыкновенная дробь
232	original amount (value)	boshlang'ich miqdor (qiymat)	первоначальная величина (значение)
233	overlapping region	kesishuvchi soha	пересекающаяся область
234	parabola	parabola	парабола
235	parallel	parallel	параллель
236	parallel displacement	parallel ko'chirish	параллельный перенос
237	parallelepiped	parallelepiped	параллелепипед
238	parallelogram	parallelogram	параллелограмм
239	particular solution	xususiy yechim	частное решение
240	pattern	nusxa, andoza	шаблон, схема
241	percent	foiz	процент
242	percentage decrease	foiz kamayishi	процентное понижение
243	percentage increase	foiz o'sishi (oshishi)	процентное увеличение
244	perimeter	perimetr	периметр
245	period	davr	период
246	periodic decimal fraction	o'nli davriy kasr	периодическая десятичная
247	periodic function	davriy funktsiya	периодическая функция
248	perpendicular vector	perpendikulyar vektor	перпендикулярный вектор
249	plane	tekislik nuqtalarni	плоскость
250	plot points	joylashtirmoq, belgilamoq	отмечать точки

251	plug into a formula	formulaga qo'yimoq	подставлять в формулу
252	point of contact	urinish nuqtasi	точка касания
253	point of intersection	kesishish nuqtasi	точка пересечения
254	polyhedron	ko'pyoq	многогранник
255	polynomial	ko'phad	полином, многочлен
256	positive number	musbat son	положительное число
257	prime factorization	tub ko'paytuvchilarga ajratmoq	разложение на простые множители
258	prime number	tub son	простое число
259	prism	prizma	призма
260	product (multiplication)	ko'paytma	произведение
261	projection (point, line)	(nuqta, chiziq) proyeksiyasi	проекция (точки, отрезка)
262	proper fraction	to'g'ri kasr	правильная
263	property	xossa	свойство
264	prove	isboqlamoq	доказывать
265	punctuation	imlo	пунктуация
266	Pythagorean theorem	Pifagor teoremasi	теорема Пифагора
267	quadrant, quarter	kvadrant, koordinata choragi	квадрант, координатная четверть
268	quadratic equation	kvadrat tenglama	квадратное уравнение
269	quadratic function	kvadrat funktsiya	квадратичная функция
270	quadrilateral	to'rtburchak	четырёхугольник
271	quantity	son, miqdor	количество, величина
272	radian	Radian	радиан
273	radical sign	ildiz belgisi	радикальный знак, корень
274	radius	Radius	радиус
275	raise to the fractional (negative) power	kasr (manfiy) darajaga oshirmoq (ko'tarmoq)	возведение в дробную (отрицательную) степень

276	range	soha, oraliq	область; диапазон; интервал
277	ratio	Nisbat	отношение
278	ratio (quotient) of a geometric progression	geometrik progressiyaning mahraji	знаменатель геометрической прогрессии
279	rational exponent (power) of a number	sonning ratsional darajasi	рациональная степень числа
280	rational number	ratsional son	рациональное число
281	ray	nur	луч
282	rectangle	to'g'ri to'rtburchak	прямоугольник
283	reduce	qisqartirmoq	сокращать
284	remainder	qoldiq	остаток
285	replace	o'rniga qo'yimoq, almashtirmoq	подставлять
286	rhombus	romb	ромб
287	right angle	to'g'ri burchak	прямой угол
288	right-angle triangle	to'g'ri burchakli uchburchak	прямоугольный треугольник
289	right-hand side	o'ngtomon	правая сторона
290	rightmost	eng o'nggi	крайний справа
291	root (degree) of an equation	tenglamaning ildizi (darajasi)	корень (степень) уравнения
292	rule	qoida	правило
293	satisfy an equation	tenglamani qanoatlantirmoq	удовлетворять уравнению
294	scalar product	skalyar ko'paytma	скалярное произведение
295	scalene triangle	har xil tomonli uchburchak	разносторонний треугольник
296	scientific notation (standard form)	ilmiy yozuv (standartshakl)	научная запись (стандартная форма)
297	secant	kesuvchi	секущая
298	sector	sektor	сектор
299	segment	segment	сегмент
300	semi open interval	yarim ochiq interval	полуоткрытый интервал

301	semicircle	yarim doira	полукруг
302	sequence (succession)	ketma-ketlik	последовательность
303	sequence of numbers	sonlar ketma-ketligi	последовательность чисел
304	series	qator	ряд
305	short multiplication formulae (SMF)	qisqa ko'paytirish formulalari (QKF)	формулы сокращенного умножения (ФСУ)
306	sign	ishora, belgi	знак; символ
307	significant figure	muhim raqam	значащая цифра
308	similar triangles	o'xshash uchburchaklar	подобные треугольники
309	simplify	soddalashtirmoq	упрощать
310	simultaneous linear equations	chiziqli tenglamalar sistemasi	система линейных уравнений
311	simultaneous linear inequalities	chiziqli tengsizliklar sistemasi	система линейных неравенств
312	simultaneous nonlinear inequalities	chiziqzili bo'lmagan tengsizliklar sistemasi	система нелинейных неравенств
313	sine	sinus	синус
314	sine curve, sinusoid	sinuosoida	синусоида
315	sketch a graph	grafik chizmoq	начертить график
316	slope	gradiyent, burchak koeffitsienti	градиент, угловой коэффициент
317	solid	fazoviy jism	пространственное тело
318	solution	yechim	решение
319	solve	yechmoq	решать
320	space	fazo	пространство
321	sphere	sfera, shar	сфера, шар
322	square-	kvadrat	квадрат
323	straight angle	yoyiq burchak	развёрнутый угол
324	straight line	to'g'ri chiziq	прямая линия
325	substitute	o'rniga qo'yimoq	подставлять
326	subtract	ayirmoq	вычитать

327	subtrahend	ayriluvchi	вычитаемое
328	sum	yig'indi	сумма
329	supplementary angle	qo'shni burchak	смежный угол
330	symbol	simvol, belgi	символ
331	symmetrical	simmetriyaviy	симметричный
332	symmetrical axis of parabola	parabolaning simmetriya chizig'i	ось симметрии параболы
333	table of values of x and y	x va y ning qiymatlar jadval	таблица значений x и y
334	take a derivative	hosila olmoq	брать производное
335	tangent	tangens	тангенс
336	tangent	urinma	касательная
337	tangent curve	tangensoida	тангенсоида
338	tangent line equation	urinma tenglamasi	уравнение касательной
339	technique	usul, texnika	способ, приём, техника
340	term	had	член
341	to be bounded	chegaralangan	быть ограниченным
342	total	yig'indi	сумма
343	trapezoid, a trapezium	trapetsiya	трапеция
344	triangular pyramid	uchburchakli piramida	треугольная пирамида
345	trigonometric function	trigonometrik funktsiya	тригонометрическая функция
346	trinomial	uchhad	трехчлен
347	truncated cone (pyramid)	kesma konus (piramida)	усеченный конус (пирамида)
348	turn to zero	nolga aylanmoq	обращаться в нуль
349	two (three) times as much (many) as	ikki (uch) barobar ko'p.	два (три) раза больше
350	two digit number	ikki xonali son	двухзначное число
351	two thirds (three fourth)	uchdan ikki (to'rt dan uch)	две трети (три четвертых)
352	union of intervals	intervallar birlashmasi	объединение интервалов

353	unique solution	yagona yechim	единственное решение
354	unit	birlik	единица измерения
355	unity vector	birlik vector	единичный вектор
356	unknown quantity	noma'lum qiymat	неизвестная величина
357	value of x	x ning qiymati	значение x
358	variable	o'zgaruvchi	переменная
359	variable range	o'zgaruvchining qiymatlar sohasi	область значений переменной
360	vector product	vector ko'paytma	векторное произведение
361	velocity	tezlik	скорость
362	Venn diagram	Venn diagrammasi	диаграмма Венна
363	verify	tekshirmoq	проверять
364	vertex	uch	вершина
365	vertex of parabola	parabola uchi	вершина параболы
366	vertical angle	vertical burchak	вертикальный угол
367	vertical axis	vertical o'q	вертикальная ось
368	Viet's theorem	Viyet teoremasi	теорема Виета
369	whole number	nomanfiy butun son	неотрицательное целое число
370	width	eni	ширина
371	x-axis	abscissa o'qi	ось абсциссы
372	x-intercept	x o'qini kesish nuqtasi	точка пересечения оси x
373	y-axis	ordinata o'qi	ось ординаты
374	y-intercept	y o'qini kesish nuqtasi	точка пересечения оси y

Useful Mathematic Symbols

No	Sym bol	What it is	How it is read	In Uzbek	In Russian	How it is used	Sample expression
1	+	Addition sign Logical OR symbol	... plus or ...	Qo'shish	Плюс	Sum of a few values Logical disjunction	$2 + 6 = 8$ $-(A + B) = -A - B$
2	*	Multiplication sign Logical AND symbol	... times and ...	Ko'paytirish	Умножение	Product of two values Logical conjunction	$2 \times 6 = 12$ $-(A * B) = -A * -B$
3	x	Multiplication sign	... times ...	Ko'paytirish	Умножение	Product of two values	$4 \times 2 = 8$
4	.	Multiplication sign	... times ...	Ko'paytirish	Умножение	Product of two values	$4 \cdot 2 = 8$
5	$\sum$	summation sign	The summation of ...	Summalash	Суммирование	Sum of many or infinitely many values	$\sum_{n=1}^{\infty} \frac{1}{n}$
6	$\int$	Integral sign	The integral of ...	Integrallash	Интеграция	integration	$\int x^2 dx = x^3 / 3 + c$
7	$\iint$	double integral sign	The double integral of ...	Ikki tomonlama integrallash	Двойная интеграция	integration	$\iint f(x,y) dx dy$
8	$\iiint$	Triple integral sign	The triple integral of ...	Uch tomonlama integrallash	Тройная интеграция	integration	$\iiint f(x,y,z) dx dy dz$
9	$\oint$	Line integral sign	The line integral of ...	Chiziqli integrallash	Линейная интеграция	integration	$\oint F dx$
10	$\iint_S$	Surface integral sign	The surface integral of ...	Sirt integratsiyasi	Поверхностный интеграл	integration	$\iint_S F(x,y,z) dx dy$
11	-	Subtraction sign Minus sign	... minus ... Negative...	Ayirish	минус	Difference of two values, negative number	$2 - 6 = -4$
12	$\pm$	Plus/minus sign	... plus or minus ...	Plyus / minus belgi	Плюс / минус	Expression of range, error, or tolerance	$540 \text{ kbps} \pm 10\%$
13	$\cdot$	Dot product sign	... dot ...	Nuqta belgisi	Точка	Scalar (dot) product of two vectors	$A \cdot B = B \cdot A$
14	$\times$	Cross product sign	... cross ...	kesishish	Крест (икс)	Vector (cross) product of two vectors	$A \times B = -(B \times A)$

15	$\prod$	Product sign	The product of ...	$\prod_{n=1}^{\infty} \frac{1}{n}$	$\prod_{n=1}^{\infty} \frac{1}{n}$	Product of three up to infinitely many values	$\prod_{n=1}^{\infty} \frac{1}{n}$
16	$^{\wedge}$	Carat	... to the power of ...	Daraja	Степень	exponent	$2^4 = 16$
17	!	Exclamation	... factorial	Faktorial	Факториал	Product of all positive integers up to a certain value	$3! = 6$
18	$\sqrt{\quad}$	surd	... root of ..	Ildiz	Корень	Algebraic expressions	$z = \sqrt{x+y}$
19	$\sqrt{\quad}$	square root symbol	The square root of ...	Kvadrat ildiz	Квадратный корень	Algebraic expressions	$\sqrt{4} = \pm 2$
20	...	Continuation sign	... and so on up to and so on indefinitely	... va shunga o'xshash va hokabo	... и так до и так до бесконечности	Extension of sequence	$S = \{1, 2, 3, \dots\}$
21	/	Slash	... divided by over ...	Taqsim	Деление	Division	$3/4 = 0.75$
22	$\div$	Division sign	... divided by ...	Bo'lish	Делить	Division	$3 \div 4 = 0.75$
23	%	Percent symbol	... percent ...	Foiz	Процент	Proportion	$0.032 = 3.2\%$
24	‰	Per mil symbol	... per mil ...	Foiz	Процент	Proportion	$0.032 = 32\text{‰}$
25	:	Colon, ratio sign	... is to such that it is true that ...	Nisbat	соотношение	Division or ratio, symbol following logical quantifier or used in defining a set	$2:4 = 20:40$ $\$x: x > 4 \text{ and } x < 5$ $"x: x < 0 \text{ or } x > -1$
26		Vertical line	... such that it is true that ...	$\$x x > 4 \text{ and } x < 5$ $"x x < 0 \text{ or } x > -1$ $S = \{x x < 3\}$	$\$x x > 4 \text{ and } x < 5$ $"x x < 0 \text{ or } x > -1$ $S = \{x x < 3\}$	Symbol following logical quantifier or used in defining a set	$\$x x > 4 \text{ and } x < 5$ $"x x < 0 \text{ or } x > -1$ $S = \{x x < 3\}$
27	::	Double colon	... averaged with ...	Ikkilamchi bo'lish	Двойная деление	arithmetic mean	$3 :: 11 = 7$
28	∞	lemniscate	... infinity ... increases without limit	Cheksiz	Бесконечность	Infinite summations Infinite sequence Limit	"x : x < ∞

29	()	Parentheses	...quantities... ...list... ...set of coordinates... ...open interval	Interval	Интервал	Denotes a quantity, list, set of coordinates, or an open interval	$(x+y) + z$ (a1, a2, a3, a4) (x,y,z) (3,5)
30	[]	Square brackets	... the quantity the closed interval ...	Yopiq interval	Закрытый интервал	Denotes a quantity or a closed interval	$w + [(x+y) + z]$ [2,4]
31	[)	Hybrid brackets	... the half-open interval ...	Yarim ochiq interval	Полуоткрытый интервал	Denotes a half-open interval	(2,4]
32	(]	Hybrid brackets	... the half-open interval ...	Yarim ochiq interval	Полуоткрытый интервал	Denotes a half-open interval	[2,4)
33	{}	Curly brackets	... the quantity the set ...	To'plam	Набор	Denotes a quantity or a set	$E = \{2, 4, 6, 8, \dots\}$
34	=	Equal sign	... equals ...	Teng	Равно	Indicates two values are the same	$\{-6\} = 6$ $2z + 4z - 6 = 0$
35	$\propto$	Proportionality sign	... is proportional to ...	Proporsionallik	Пропорциональность	Indicates two variables change in direct proportion	$x \propto y$
36	$\sim$	Similarity sign	... is similar to ...	O'xshash	Сходство	Indicates two objects are geometrically similar	$ABC \sim DEF$
37	$\approx$	Approximate equal sign	... is approximately equal to ...	Taqribiy	Приближенный	Indicates two values are close to each other	$x + y \approx z$
38	$\neq$	Inequality sign	... is not equal to ...	Teng emas	Не равно	Indicates two values are different	$x \neq y$
39	<	Inequality sign	... is less than ...	Kichik	Меньше	Indicates value on left is smaller than value on right	$2 < 4$ $x < y$
40	$\leq$	Inequality sign	... is less than or equal to is at most equal to ...	Kichik yoki teng	Меньше или равно	Indicates value on left is smaller than or equal to value on right	$x \leq y$
41	>	Inequality sign	... is greater than ...	Katta	Больше	Indicates value on left is larger than value on right	$4 > 1$ $x > y$
42	$\geq$	Inequality sign	... is greater than or equal to ...	Katta yoki teng	Больше или равно	Indicates value on left is larger than or equal to value on right	$x \geq y$

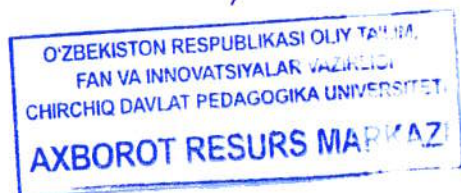
43		absolute value sign	The absolute value of ...	Absolyut qiymat	Абсолютное значение	Distance of value from origin in number line, plane, or space	$ -5 = 5$
44	Δ	increment sign, Triangle symbol	the change in ... triangle ...	Uchburchak	Триугольник	Indicates a small change, Denotes vertices of triangle	$m = \Delta y / \Delta x$ $\Delta ABC = \Delta DEF$
45	$\perp$	Perpendicularity symbol	... is perpendicular to ...	Perpendikulyar	Перпендикуляр	Geometry	$L \perp M$
46	//	Parallel symbol	... is parallel to ...	Parallel	Параллель	Geometry	$L // M$
47		angle symbol	Angle ...	Burchak	Угол	Geometry	$ABC = \angle DEF$
48	$\exists$	Existential quantifier	For some ... There exists a(n) ...	Kvantor mavjudligi	Квантор существования	Logical statements	$\exists x : x > 4$ and $x < 5$
49	$\forall$	Universal quantifier	Universal quantifier	Ixtiyoriy	Универсальный квантifikator	Logical statements	$\forall x : x < 0$ or $x > -1$
50	$\neg$	Logical negation symbol	not ...	Inkor	Отрицание	Logical statements	$\neg(A) \leftrightarrow A$
51	$\rightarrow$	logical implication symbol	... implies ... If ... then ...	Implikasiya	Импликация	Logical statements	$A \rightarrow B$
52	$\leftrightarrow$	logical equivalence symbol	... is logically equivalent to ... if and only if ...	Ekvivalentlik	Эквивалентность	Logical statements	$A \leftrightarrow B$
53	$\therefore$	Three dots	... therefore ... it follows that ...	Tomonlama	следовательно	Logical statements or mathematical proofs	$x = y$ and $y = z$ $\therefore x = z$
54	$\in$	Element-of symbol	... is an element of a set ...	Tegishli	Принадлежит	Sets	$a \in A$
55	$\notin$	Not-element-of symbol	... is not an element of a set ...	Tegishli emas	Не принадлежит	Sets	$b \notin A$
56	$\subseteq$	Subset symbol	... is a subset of ...	Qism to'plam	Подмножество	Sets	$A \subseteq B$
57	$\subset$	Proper subset symbol	... is a proper subset of ...	To'g'ri qism to'plam	Правильное подмножество	Sets	$A \subset B$
58	$\cup$	Union symbol	... union ...	Birlashma	Объединение	Sets	$A \cup B = B \cup A$

59	$\cap$	Intersection symbol	... intersect ... intersected with ...	Kesishma	Пересечение	Sets	$A \cap B = B \cap A$
60	$\emptyset$	Null symbol	The null set The empty set	Bo'sh to'plam	Пустое множество	Sets	$\emptyset = \{ \}$
61	$\aleph$	Hebrew aleph (uppercase)	Aleph ...	$\aleph_1 + \aleph_0 = \aleph_1$	$\aleph_1 + \aleph_0 = \aleph_1$	Transfinite cardinal	$\aleph_1 + \aleph_0 = \aleph_1$
62	$^\circ$	Degree symbol	... degree(s)	Gradus	Градус	Angular measure Temperature	$\varphi = 45^\circ$ $T = +20^\circ \text{C}$
63	θ	Greek theta (lowercase)	... theta ...	Teta	Terra	Angular variable	$\theta = 90^\circ$
64	φ	Greek phi (lowercase)	... phi ...	Fi	фи	Angular variable	$\varphi = 45^\circ$
65	λ	Greek lambda (lowercase)	... lambda ...	Lyamda	Лямда	wavelength Ratio Eigenvalue Lebesgue measure prefix multiplier	$\lambda = 70 \text{ cm}$ $\lambda = 3:1$
66	μ	Greek mu (lowercase)	micro- (10 ⁻⁶)	Myu	Мю	prefix multiplier	$C = 0.001 \mu\text{F}$
67	π	Greek pi (lowercase)	... pi ...	Pi	Пи	General science	$\pi \approx 3.14159$
68	Ω	Greek omega (uppercase)	... omega ...	Omega	Омега	Volume of an object Ohms (resistance)	$R_2 = 330 \Omega$
69	ω	Greek omega (lowercase)	... omega ...	Omega	Омега	Transfinite ordinal Angular velocity Period	$\omega = 36,000 \text{ rad/s}$ $\omega = 1/60 \text{ s}$
70	$\mathbb{N}, \mathbb{N}$	Enhanced or bold N	The set of natural numbers	Natural sonlar to'plami	Множество натуральных чисел	Number theory Set theory	$\mathbb{N} = \{0, 1, 2, 3, \dots\}$
71	$\mathbb{Z}, \mathbb{Z}$	Enhanced or bold Z	The set of integers	Butun sonlar to'plami	Множество целых чисел	Number theory Set theory	$\mathbb{Z} = \{0, 1, -1, 2, -2, 3, -3, \dots\}$
72	$\mathbb{Q}, \mathbb{Q}$	Enhanced or bold Q	The set of rational numbers	Ratsional sonlar to'plami	Множество рациональных чисел	Number theory Set theory	$\mathbb{Q} = \{a/b \mid a \text{ and } b \text{ are in } \mathbb{Z}\}$
73	$\mathbb{R}, \mathbb{R}$	Enhanced or bold R	The set of real numbers	Haqiqiy sonlar to'plami	Множество действительных чисел	Number theory Set theory	What is the cardinality of $\mathbb{R}$?

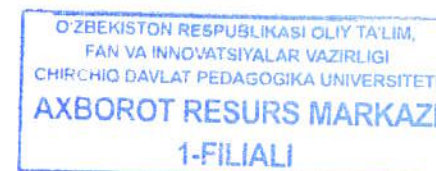
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