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Пропонованийпосібникскладеновідповідно до навчальноїпрограми з іноземноїмовифаховогоспрямування і з урахуваннямсучаснихметодівнавчання. Посібникскладається з десятирозділів. Кожнийрозділміститьтематичнітексти та творчі і комунікативнізавдання. Мета посібника – допомогти студентам опануватибазову лексику, навчитиїх основ перекладу фаховоїлітератури й удосконалитикомунікативнінавички та вміння. Посібникможнавикористовувати для роботи в аудиторії та самостійних занять. Розраховано на студентівденної та заочноїформинавчання.

**UNIT1**

**THEDIGITALAGE**

1. ***Learn the basic vocabulary terms:***

|  |  |
| --- | --- |
| accurate –точнийback-up –резервнакопія(ресурс)to break down – вийтизладу, зламатисяcalculations – обчислення, розрахунокdigital –цифровийinternal – внутрішнійtoenable–увімкнути, дозволитиgeneration – поколінняgeneralpurposecomputer – комп’ютерзагальногопризначенняinput device – пристрійвведенняoutput device – пристрійвиводуmalfunction – збій, неполадкаmultitasking – багатозадачнийpunch tape перфорованастрічкаprintout – видруковуванняto be required – бутинеобхідним | *circuit* – 1. лініязв'язку2. (двосторонній) каналзв'язку3. (електронна) схема*processing* –1. обробка2. виконання*software*–1. програмнезабезпечення2. програма, програмнийзасіб*storage*–1. пам'ять2. зберігання (інформації)tostore – зберігати (інформацію)*shift*1. зрушення (в машиннійграфіці)2. змінарегістра |

**THE DIGITAL AGE**

We are now living in what some people call the digital age, meaning that computers have become an essential part of our lives. Young people who have grown up with PCs and mobile phones are often called the digital generation.

How does the digital transformationaffect people’s lives and well-being?Digital technologies have radically changed the way people work, consume, and communicate over a short period of time. Across the globe, policymakers are starting to understand that we are on the verge of major transformations in almost all areas as the different digital technologies continue to develop.

Digital age is a period in human history characterized by the shift from traditional industry that the Industrial Revolution brought through industrialization, to an economy based on information computerization. During the information age, the phenomenon is that the digital industry creates a knowledge-based society surrounded by a high-tech global economy that spans over its influence on how the manufacturing throughput and the service sector operate in an efficient and convenient way.

In a commercialized society, the information industry is able to allow individuals to explore their personalized needs, therefore simplifying the procedure of making decisions for transactions and significantly lowering costs for both the producers and buyers.

The Information Age formed by capitalizing on computer microminiaturization advances. This evolution of technology in daily life and social organization has led to the fact that the modernization of information and communication processes has become the driving force of social evolution.Everything is becoming digitized. We already walk around with small computers in our pockets and on our wrists. Soon, we won’t be able to go five seconds without interacting with some sort of digital software—we’re almost there now.

A lot of people worry that tech is killing human connection, but it can actually help us to build stronger relationships.With the help of AI-driven data, your computer will begin to do things like schedule coffee dates or activities with your friends at regular intervals. Your devices will take account of preferences, habits, and all sorts of other relevant information.We’ll be able to devote more time and energy to the things that matter. Our days are filled with plenty of tasks whether it’s going to the post office, doing laundry, or buying milk.But automation is stepping in to handle this kind of work. People hate repetitive work and rarely find it exciting. From self-driving cars to groceries that re-order themselves, technology can save people from unpleasant tasks. The result is freeing up more time to do the things we actually enjoy, which is a huge benefit.

For the elderly and disabled, automated light controls, doors and locks, appliances, reminders, and security features will make it much easier for them to get through their days. They can pre-set their thermostat, use their voices to turn on the TV or music, and even make sure the front door is locked at night without even getting out of bed.

While the digital transformation could bring amazing opportunities it also has certain risks.One of the top concerns is the worry that automation will steal people’s jobs. And they aren’t totally off base. A recent study found that automation could replace lots of different jobs from factory line jobs to professions like accounting and medicine. Artificial intelligence (AI) technologies mean that more and more tasks can now be completed by machines or algorithms. An app on the BBC website called “will a robot take your job” even enables you to enter your current job title to understand how likely you are to be replaced.

With the increase in “screen addiction” globally, the worldwide attention span is now averaging a mere 8 secondsfor any given subject. This can lead to developmental disorders, including depression, anxiety, social exclusion, conflict avoidance.Additionally, we have apparently lost our civility. Rather than personally saying “please, thank you” and other niceties, we’ve replaced it with online check-ins and other indirect forms of communication.

Our dependence on technology will become greater, as the information stored and available in online formats increases;

***3. Answer the following questions:***

1. Name some types of devices that use “computers on a chip”.

2. What are the benefits of using computers with the following items?

a) Security systems b) Cars c) Phones

4. What smart devices are mentioned in the text?

5. How do you understand the concept of microminiaturization?

6. What are the advantages of multimedia?

7. Do you consider “screen addiction” a problem for young people?

8. How can computers help the disabled?

9. Give examples of the impact computers have on our lives.

10. How does good knowledge of English help to operate the computer better?

***4. Say if the statements are true or false:***

1. People who use computers or mobile phones are called the digital generation.
2. Desktop organizers are programs that require desktop computers.
3. Computers are sometimes used to monitor systems that previously needed human supervision.
4. Networking is a way of allowing otherwise incompatible systems to communicate and share resources.
5. The use of computers prevents people from being creative.
6. Computer users do not have much influence over the way that computing develops.
7. With the time the people’s dependence on technology will become weaker.
8. Computers are great sources for entertainment.
9. We should spend time in front of screen with a purpose and meaning and we should always remember that the real world lies off-screen!
10. Computers have made important contributions in various fields including science, technology, education, society and many more!

***5. Complete the text with verbs from the box:***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |  |  |  |
| --- | --- | --- | --- |
| accuratepublishing | graphicsnetworking | recordsmemory | retrieveback-up |
| on-linetransactions | displaydrive | peripheralssupplies | printercomponents |

 |

***Using Computers***

Computers are being used more and more in business because they are fast, efficient and 1\_\_\_\_\_\_\_.Here are some ways in which computers are used:

- Insurance companies use them to store and 2\_\_\_\_\_\_\_ details of clients’ policies.

- Production departments in companies use them to ensure they have adequate 3\_\_\_\_\_\_\_ of raw materials and 4\_\_\_\_\_\_\_.

- Banks use them for processing details of accounts and 5\_\_\_\_\_\_\_.

- Personnel departments use them to keep 6\_\_\_\_\_\_\_ of a company’s employees.

For the most part, the computers, software, and 7\_\_\_\_\_\_\_ that are needed depend on individual needs. For instance, if you’re an architect you may want a system with good 8\_\_\_\_\_\_\_ capability. If a lot of records are to be kept, then you’ll want ample 9\_\_\_\_\_\_\_, perhaps even a CD-ROM 10\_\_\_\_\_\_\_ for permanent storage of massive amounts of data. Regular disks can then be used for 11\_\_\_\_\_\_\_ copies. For desktop 12\_\_\_\_\_\_\_, you may want a monitor with a full-page 13\_\_\_\_\_\_\_ and a high-quality laser 14\_\_\_\_\_\_\_. If quality printing is not so important, then a cheaper ink-jet or even cheaper dot-matrix printer may be more suitable. If you’re in a business where you need to do a lot of 15\_\_\_\_\_\_\_, then maybe you should consider a modem, so you can communicate with other computers 16\_\_\_\_\_\_\_.

***6. Match the word combinations with appropriate translations. Use them in your situations.***

|  |  |
| --- | --- |
| 1. to plug instruction2. fast and accurately3. to do weather forecasting4. computer user group5. to keep records of financial affairs6. to take a square root7. to raise to a power8. low level languages9. a set of instructions10. a software programmer11. to come for an interview12. in daily use13. to do useful work14. to process data15. to save a lot of money16. to do a lot of operations | a) прогнозувати погодуb) програмістc) вести облікфінансовихробітd) виконуватибагатоопераційe) добуватиквадратнийкоріньf) підносити до степеняg) низка вказівокh) швидко і точноi) виконуватикорисну роботуj) ком’ютерний кружокk) мовинизькогорівняl) прийти на співбесідуm) у повсякденномужиттіn) оброблятиданіo) ввести командуp) економитибагатогрошей |

***7. Choose the right word or phrase:***

1. A computer is a kind of \_\_\_\_\_ .

1. a countingmachine
2. a typewriter
3. a tablegame

2. **IC chips used in computers are usually made of:**

1. lead
2. silicon
3. chromium

3. Which is a single integrated circuit?

1. chip
2. motherboard
3. gate

4. Output devices serve for displaying the \_\_\_\_\_.

1. diagrams
2. resultsofcalculations
3. words

5. Web pages are written using?

1. FTP
2. HTML
3. URL

6. A device that converts digital signals to analog signals is…?

1. packet
2. ethernet
3. modem

7. What is the primary requisite of a good computer programmer?

1. mathematical mind
2. logical mind
3. scientific knowledge

8. A computer use which type of number system to calculate and to store data

1. decimal
2. digital
3. binary

9. Total number of function keys in a computer keyboard

1. 10
2. 12
3. 14

***8. Use collocations in the box to complete these sentences:***

|  |
| --- |
|  *access the Internet, perform operations, do research, make calls, send texts, display data, write letters, store information, complete exercises, carry out transactions* |

1.  Thanks to Wi-Fi, it's now easy to \_\_\_\_ from cafes, hotels, parks and other public places.

2.  Online banking lets you \_\_\_\_\_\_ between your accounts easily and securely.

3.  Skypeis a technology that enables users to \_\_\_\_\_\_ over the Internet for free.

4.  In many universities, students are encouraged to \_\_\_\_\_\_ using PowerPoint in order to make their talks more visually attractive.

5.  The Web has revolutionized the way people \_\_\_\_\_\_ - with sites such as *Google*and *Wikipedia,*you can find the information you need in seconds.

6.  *Cookies*allow a website to \_\_\_\_\_\_ on a user's machine and later retrieve it; when you visit the website again, it remembers your preferences.

7.  With the latest mobile phones, you can \_\_\_\_\_\_ with multimedia attachments - pictures, audio, even video.

***9. Match two parts of the sentences***

|  |  |
| --- | --- |
| 1. Computer technology …
2. Computer is used…

3. The ability of computers to solve many mathematical problems…4. Thanks to discovery ofelectricity…5. If a problem cannot be solved…6. What makes the computer different from an adding machine…7. Computers accept information…8. Smaller devices generally means …9. The extreme use of the Internet …  | 1. has given rise to new trends in mathematics.
2. we can listen to the radio, watch TV, see films.
3. is that the computer can modify its instructions.
4. to convert data into information and to storeinformation in the digital form.
5. the computer can search its memory for another set of instructions until a solution isfound.
6. plays the most important role in the progressof science.
7. in the form of instructions called a program.
8. more portability and less space used up in living spaces.
9. has been associated with a number of mental health risks.
 |

**WORD-STUDY**

***1W. Write out the wordsfrom the text that can be different parts of speech.***

*Model: work (n) — work (v) (праця — працювати)*

 *fast (adj) — fast (adv) (швидкий — швидко)*

 *separate (adj) — separate (v) (окремий — розділяти)*

***2W. Learn the following speech patterns. Make your sentences with the following patterns***

A

He did his job **as well as** we expected.

I don’t play chess **as well as** my friend.

Professor Hunt teaches programming **as well as** mathematics.

B

**It was they/them who** told me the news.

**It was in May that** I saw him last.

**It is a good horse that** never stumbles.

**It is in the memory that** the data are stored

***3W.*Complete the sentences using the speech patterns:**

*as well as; whether or not; whether … or not; when; while; such that; it is/was … that/who; of what; on what; that is****.***

1. I don’t know … I like it … because I haven’t tried it before. 2. … my question … made him angry. 3. The air traffic service unit should provide the flight crew with any information requested … any additional relevant information. 4. … making a conscious effort to memorize something, many people engage in ‘rote rehearsal’ repeating it over and over again. 5. A scratch card is a ticket that reveals … the holder is eligible for a prize when the surface is removed by scratching. 6. … congratulating ourselves on what has been accomplished over the last twenty years, we should remember gratefully the services of many people. 7. Computer programming is issuing a sequenceof commands to a computer to achieve an objective, … to make a computer perform calculations on numerical data. 8. The architect believed that buildings are most interesting … still unfinished. 9. He was known for his ill temper … everyone disliked him. 10. It depends … you want. 11. … he/him … has done it. 12. Many people today telecommunicate — …, use their computers tostay in touch with the office … working at home. 13. The contractors that renovated the building left the original concrete floors … installing industrial-looking steel walls. 14. … John von Neumann … put forward the idea of a stored-program computer. 15. Waste is anything rejected as useless, worthless, or in excess … is required. 16. The article deals with some problems of fault-tolerant software development … with the ways of their solution.

***4W. Translate the following sentences into English usingspeech patterns***

1. Саме в процесорівідбуваєтьсяобробкаінформації. 2. В машинніймовікоманди, так само, як і дані, представлені у виглядідвійкового коду. 3. Вибух мав величезну силу, таку, щовсівікна в навколишніхбудинкахбулорозбито. 4. Поїдетевитудичині — залежитьвід того, щоскаже шеф. 5. Дональд вклонивсяїй, колийоговідрекомендували. 6. Наша футбольна команда зігралавчора так само добре, як вона граєзавжди. 7. Середзнайомих Джозеф вважавсярозумноюлюдиноюнастільки, щокожнийпрагнувспитатийогопоради з будь-якогопитання. 8. Чи буде дощ, чині, матчвсе одно відбудеться. 9.Самемоєзауваженнязмусилоїїнервувати. 10. Давайте підсумуємо (havethebalance), скільки ви менівинні (owe).

11. Саме вонаізналася про все першою. 12. Під час подорожівінмусивдекількаразівзаправлятисвійавтомобіль.

**5W. Find the sentences in which the verbs ‘to have’ and ‘to be’ aretranslated as «повинен»:**

1. This ordinary adding machine has ten keys for each column of digits.2. The main task of this article was to show the results of research work. 3. Thispersonal computer has been constructed at our lab. 4. The lecture was to begin at9 o’clock. 5. Our aim is to study hard and master our speciality. 6. Our labassistant has to construct this electronic device (прибор). 7. The general purposeof this unit (block) is to perform different arithmetic operations. 8. Theparticipants of the scientific conference are to arrive tomorrow. 9. You have toremember the names of the scientists who have contributed to the developmentof your speciality. 10. The results of the experiment have carefully been checkedup today.

***6W. Form the nouns using the suffixes: -ment, -er/-or, -tion, -ssion, -ness, -ance/-ence from the verbs:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| to compute | to operate | to inform | to teach | to perform |
| to generate | to measure | to determine | to manage | to relax |
| to apply | to produce | to process | to exist | to execute |

***7W. Look at these extracts from various websites. Are the words in bold verbs, nouns, adjectives or adverbs?***

|  |  |
| --- | --- |
| 1.       Click here to begin your **download**.2.      **Download** the MP3 file now!3.      Buy now by visiting our **store**. | 4.       We will not **store** your details for more than 14 days.5.      Click here for an **online** discount.6. Buy **online** by clicking here. |

***8W. Match the synonyms. Nouns:***

|  |  |
| --- | --- |
| 1. component 2. purpose 3. device 4. advantage 5. capacity 6. aid7. procedure8. details | a) operation b) aim c) preference d) data e) part f) help g) power h) apparatus |

***9W.Learn the word combinations with the word*** mean***. Make your own sentences with them:***

*A means toward the end - засіб досягнення мети*

*by all means – за всяку ціну by any means – будь якими засобами by means of – за допомогою by no means - у жодному разі by some means or other – тим чи іншим чином*

**10W. Read and translate the following sentences paying attention to the meaning of the words and word combinations given below:**

a) mean – середній; means – засіб; to mean – значити, мати на увазі; meaning – значення; by means of – за допомогою; by no means – ні в якому разі.

1. The year **mean** temperature in our town is about + 80. 2. Electrical typewriters and keyboard devices are the common **means** of input into a computer. 3. This **means** that the ROM is the permanent memory chip for program storage. 4. **By means** of arranging memory registers inside hardware it is possible to store information and instructions. 5. **By no means** the computer can substitute a human being in all respects. 6. The **meaning** of the word «means» is «засіб», «стан». 7. What do you mean by that?

b) term – термін; строк; семестр; to term – називати; in terms of – з точки зору; мовою.

 1. The **term** «programming» means the process by which a set of instructions is produced for a computer to make it performing specified activity. 2. President of the USA is elected for a four-year **term**. 3. Each academic year at institutes and universities in our country consists of two **terms**. 4. A code can be written **in terms of** automatic language for then it is easy to make changes in it. 5. A code may be **termed** a program or a routine because they are synonyms. 6. If the language being described is called simply «the language», then the language **in terms of** which the description is being made is called «metalanguage».

c) available – доступний, дійсний; придатний.

1. A number of different computing devices **available** in our Institute’s lab is very great. 2. The computer ES-1045 is now available for students’ use. 3. Off all the instruments available the control generator is the most suitable for producing electrical impulses.

*(Text1)****Additional texts***

A computer can be defined as any electronic device that gets and accepts data,stores it and processes the data into meaningful information understandable by the user.With the definition in mind,we can list examples of computers like watches,calculators, television sets,thermometers,laptops and mobile phones to be true.All of them get data and manipulate it into necessary information. You can agree that there is no device called by name as computer.Computer is just a generic term comprising of many devices.Other than calling a machine in an office as computer,we can call them as desktops,laptops, etc.Therefore, we should know that it is so wrong to call desktops as just a computer,even a calculator is a computer and it has never been called computer as a name.Computers can broadly be categorized according to age,size, purpose or functionality, and processing.

According to the age,computers are grouped in terms of generations. They include;1st generation computers,2nd generation computers,3rd generation computers,4th generation computers, and finally 5th generation computers.
**1st generation computers.**This is a generation of computers that were discovered between the years 1946 and 1957.These computers used vacuum tubes for circuiting and magnetic drums for memory.They were large in size and could take up the entire room.These computers were very expensive to operate and in addition to using a great deal of electricity, the first computers generated a lot of heat, which was often the cause of malfunctions.First generation computers relied on machine language, the lowest-level programming language understood by computers, to perform operations, and they could only solve one problem at a time. Input was based on punched cards and paper tape, and output was displayed on printouts.

**2nd generation computers.**These computers existed between the years 1958 and 1964.They used transistors for circuitry purposes.The transistor was far superior to the vacuum tube, allowing computers to become smaller, faster, cheaper, more energy-efficient and more reliable than their first-generation predecessors. During this generation, programming languages such as COBOL and FORTRAN were developed but they still relied on punched cards.

**3rd generation computers.**These are computers that existed between 1965 and 1971.The development of the integrated circuit was the hallmark of the third generation of computers. Transistors were miniaturized and placed on silicon chips, called semiconductors, which drastically increased the speed and efficiency of computers.Instead of punched cards and printouts, users interacted with third generation computers through keyboards and monitors.  Computers for the first time became accessible to a mass audience because they were smaller and cheaper than their predecessors.

**4th generation computers.**The computers under this generation were discovered from 1972 to 1990s. The microprocessor brought the fourth generation of computers, as thousands of integrated circuits were built onto a single silicon chip. What in the first generation filled an entire room could now fit in the palm of the hand. The Intel 4004 chip, developed in 1971, located all the components of the computer—from the central processing unitand memory to input/output controls—on a single chip.As millions of electronic components got integrated in a tiny chip, the computers became very small with increased speed, reliability and reduction in cost.

**5th generation computers.**These are computers that are still under development. The memory speed of these computers is extremely high.The computers can perform parallel processing. It is during this generation that Artificial Intelligence (AI) concept was generated e.g voice and speech recognition. These computers will use quantum computation and molecular technology.The goal of fifth-generation computing is to develop devices that respond to natural language input and are capable of learning and self-organization.

According to power and size,computers are divided into microcomputers, minicomputers, supercomputers, mainframe computers and mobile computers.
According to purpose or functionality, computers are classified as general purpose and special purpose computers. General purpose computers solve large variety of problems.They are said to be multipurpose for they perform a wide range of tasks. Examples of general-purpose computer include desktop and laptops.
On the other hand,special purpose computers solve only specific problems.They are dedicated to performing only particular tasks.Examples of special purpose computers can include calculators and money counting machine.
According to processing, computers are divided into digital,analog and hybrid computers.

**1D. Match a word in the box with a definition to find out what you know.**

|  |  |
| --- | --- |
| 1. a modem
2. a computer nerd
3. a disk
4. a mouse
5. the Internet
6. cyberspace
7. a technophobe
8. a cyberbuddy
 | 1. a person who doesn't like modern machines, especially computers;
2. a computer system which allows millions of computer users around the world to exchange information;
3. a piece of electronic equipment that allows information to be sent along telephone wires from one computer to another;
4. a friend who you only ever communicate withthrough computers;
5. a small object which you move with your hands to give instructions to a computer;
6. a flat piece of plastic you use for storing information;
7. the imaginary place where messages, information pictures
8. someone whose life is dominated by computers
 |

**Computer graphics**

Computer graphics are pictures and drawings produced by computer. A graphics program interprets the input provided by the user and transforms 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 data into precise shapes and colours. Graphics can be developed for a variety of uses including presentations, desktop publishing, illustrations, architectural designs and detailed engineering drawings.

Mechanical engineers use sophisticated programs for applications in computer-aided design and computer-aided manufacturing. Let us take, for example, 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.

Computers are also used to present data in a more understandable form: electrical engineers use computer graphics to design circuits and people in business can present information visually to clients in graphs and diagrams. These are much more effective ways of communicating than lists of figures or long explanations.

Today, three-dimensional graphics, along with colour and animation, are essential for such applications as fine art, graphic design, Web-page design, computer-aided engineering 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 the appropriate software they can study the structure of objects and how it is affected by particular changes.

Basically, computer graphics help users to understand complex information quickly by presenting it in a clear visual form.

***2D. Read through the text and find the answers to these questions:***

1.           What are “computer graphics”?

2.           What do the acronyms “CAD”, “CAE” and “CAM” stand for?

3.           What are the benefits of using computer graphics in the car industry?

4.           What are the benefits of using graphics in business?

5.           What is “computer animation”?

***3D. Graphics programs have several options that work in conjunction with the tools menu to enable the user to manipulate and change pictures.Look at the facilities on the left and match them with the definitions on the right:***

|  |  |
| --- | --- |
| 1) Patterns menu2) Scaling3) Rotating4) Inverting5) Zoom6) Slanting7) Black-and-white dithering | a)        Turning an image round.b)        A tool which lets you scale the 'view' of a picture and edit a small portion of it as if you were working under a magnifying glass. It is very useful for doing detailed work as you can edit the picture one dot at a time.c)         Making the object larger or smaller in any of the horizontal, vertical or depth directions.d)        A shading technique where two different colours are placed next to each other; the human eye blends the colours to form a third one. It is also used to show shading in black and white.e)         A palette from which you choose a design to fill in shapes.f)          Reversing the colour of the dots in the selected part of a picture, so that white dots become black and black dots become white.g)        Inclining an object to an oblique position. |

 **UNIT 2**

**COMPUTER SYSTEM**

1. ***Learn the basic vocabulary terms:***

|  |  |
| --- | --- |
| to allow – дозволятиconverter – перетворювачtocreate – створюватиdatabaselisting – роздруківка бази данихitem – елементin-memoryprocessing– резидентне обробляння данихmedium – середнійoptional – додатковийportable - переноснийtoprocess – опрацьовуватиtoprovide – забезпечуватиperipheraldevice – зовнішній пристрійtorequire – потребуватиretrieve – відновити (*інформацію)*tosolve – вирішувати  | *hardware*1. комп’ютерне устаткування2. апаратні засоби*3. розм.* залізо*mainframe*1. велика ЕОМ 2. центральний процесор, ЦПП*manual*1. інструкція 2. з ручним керуванням*terminal* – 1. кінцевий2. клема, затискач3. кінцевий пункт4. пристрій, що є джерелом або одержувачем даних |

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

**COMPUTER SYSTEM**

A computer system is a collection of components that work together to process data. The purpose of a computer system is to make it as easy as possible for you to use a computer to solve problems. A functioning computer system combines hardware elements with software elements. The hardware elements are the mechanical devices in the system, the machinery and the electronics that perform physical functions. The software elements are the programs written for the system; these programs perform logical and mathematical operations and provide a means for you to control the system. Documentation includes the manuals and listings that tell you how to use the hardware and software. Collectively these components provide a complete computer system: system hardware + system software + system documentation = computer system.

Usually a computer system requires three basic hardware items: the computer, which performs all data processing; a terminal device, used like a typewriter for two-way communication between the user and the system; and a storage medium for storing programs and data. These three devices – the computer, the terminal and the storage medium – are the required hardware components of any computer system. Optional peripheral devices are added to a computer system according to the specific needs of the system users. For example, computer systems that are used primarily for program development may have extra storage devices and a high-speed printing device. Computer systems used in a laboratory may have graphics display hardware, an oscilloscope device, and an analog-to-digital converter.

Peripheral devices are categorized as input/output (I/O) devices since the functions they perform provide information (input) to the computer, accept information (output) from the computer, or do both. Line printers are output devices because they perform only output operations. Terminals and storage devices are input/output devices because they perform both input and output operations. System software is an organized set of supplied programs that effectively transform the system hardware components into usable tools. These programs include operations, functions, and routines that make it easier for you to use the hardware to solve problems and produce results. For example, some system programs store and retrieve data among the various peripheral devices. Others perform difficult or lengthy mathematical calculations. Some programs allow you to create, edit, and process application programs of your own. System software always includes an operating system, which is the «intelligence» of the computer system. Usually the system software includes one or several language processors.

There are different types of computer of varying size and power, including the following:

* Supercomputer (the most powerful type of mainframe)
* Mainframe (large, very powerful, multi-user i.e. can be used by many people at the same time, multi-tasking i.e. can run many programs and process different sets of data at the same time)
* Minicomputer (smaller than a mainframe, powerful, multi-user, multi-tasking)
* Personal computer (PC) (single user)
* Desktop computer (suitable size for sitting on an office desk)
* Workstation (most powerful type of desktop, used for graphic design, etc.)
* Portable (can be carried around, can operate with batteries)
* Laptop (large portable, can be rested on user's lap)
* Notebook (size of a sheet of notebook paper)
* Handheld (can be held in one hand)
* Pen-based (main input device is an electronic pen)
* PDA (personal digital assistant, has functions such as task lists, diary, address book)

Note that the term PC usually refers to an IBM compatible personal computer i.e. an Apple Mac personal computer is not referred to as a PC. A computer that provides a service on a network e.g. storing files, sharing a printer, is known as a server computer. Server computers usually have a UPS (uninterruptible power supply) attached to them. This is a battery that automatically provides an electricity supply to allow the server to shut itself down properly if the main supply fails.

***3. Answer the following questions:***

1. What is the purpose of a computer system?
2. How do hardware elements differ from software elements?
3. What is the purpose of the manuals?
4. What are the three basic hardware items?
5. Why do the users need optional peripheral devices?
6. What are the peripheral devices?
7. What are the main functions of the system software?
8. How does a notebook differ from a laptop?
9. What is a server computer?
10. What is a UPS?
11. What are the advantages in making computers smaller?

***4. Say if the statements are true or false:***

1. The software elements are the mechanical devices in the system.
2. The software programs perform logical and mathematical operations.
3. Usually a computer system requires four basic hardware items.
4. Peripheral devices are categorized as input/output (I/O) devices.
5. Line printers are input devices because they perform only input operations.
6. Terminals and storage devices are output devices.
7. An operating system is the «intelligence» of the computer system.
8. Desktop computer is a portable device.
9. Apple Macis a personal computer.
10. I/O is a small symbol on a computer screen which represents a program.

***5. Complete the text with verbs from the box:***

|  |
| --- |
| data economically tasksmainframes faster blocks |

Supercomputers take advantage of the most recent advances in electronic circuits, processing techniques, and memory organization to reach computing speeds many times that of ..1.. . Complex problems in CAD/CAM that were not even considered several years ago can now be solved ..2.. . Applications of supercomputers include modelling and simulation .. 3.. such as solid modelling, kinematics, analysis, and fluid-flow simulations. Another major application is a finite-element analysis. Here, a supercomputer will perform the task three to ten times ..4.. than a mainframe. Supercomputers work so much faster because of ..5.. pipelining, high-speed circuits, and large internal ..6.. . In pipelining, data elements are streamed through the processor in ..7.. instead of being handled oneat-a-time as in conventional computers.

***6. Match the terms with the appropriate definitions.***

|  |  |
| --- | --- |
| 1. background
2. delete
3. double-click
4. file
5. folder
6. icon
7. recycle Bin
8. screensaver
9. personalize
10. desktop
 | a) to remove smth that has been stored on a computer b) a place where a number of computer files or documents can be stored together c) a program that runs a moving image on a computer screen when the keyboard and the mouse are not being usedd) to design or change smth so that it is suitable for the needs of one particular persone) the first screen that appears when you turn on your computer and which displays icons that represent files, folders, documents, etcf) picture or colour on the first screen that appears when you turn on the computerg) the folder in Microsoft Windows where files or programs that have been deleted or removed are storedh) to press one of the buttons on a mouse twice quickly in order to start an action on screeni) a small symbol on a computer screen which represents a program, or a filej) a collection of information, such as a Word document or a picture, which is stored in a computer, under a particular name |

***7. Guess what is:***

1. a heart of a microcomputer
2. a tiny processor on a single chip used in microcomputer
3. data storage system created by man
4. a computer used for home and personal use
5. a set of instructions composed for solving given problems by computer
6. a part of a computer which stores information
7. a small-scale computer using a single microprocessor chip in its architecture
8. a part of a computer which allows the user to communicate with the computer

***8. Match the terms with the appropriate definitions.***

|  |  |
| --- | --- |
| a desktop computer | a) this computer is especially suited for storing and distributing data on a network; these machines do not include features such as sound cards, DVD players, and other fun accessories; they don’t require specific hardware and just about any computer can be configured to perform such work; |
| a notebook | b) these are powerful desktop computers designed for specialized tasks; they can tackle tasks that require a lot of processing speed, most have circuitry specially designed for creating and displaying three-dimensional and animated graphics and often dedicated to design tasks; |
| a tablet computer | c) it’s a large and expensive computer capable of *simultaneously* processing data for hundreds or thousands of users; used by businesses or governments to provide centralized storage, processing and management for large amount of data in situations where reliability, data security and centralized control are necessary; |
| a handheld computer | d) it fits on a desk and runs on power from an electrical wall outlet; its keyboard is typically a separate component, connected to the main *unit* by a cable; |
| a workstation | e) it’s a portable computing device featuring a touch-sensitive screen that can be used as a writing or drawing pad; |
| a mainframe computer | f) it’s one of the fastest computers in the world; can tackle complex tasks such as breaking codes, modeling worldwide weather systems and simulating nuclear explosions; |
| a supercomputer | g) it *features* a small keyboard or touch-sensitive screen and is designed to fit into a pocket, run on batteries and be used while you are holding it; also called a PDA (personal digital assistant), it can be used as an electronic appointment book, address book, calculator and notepad; |
| a server | h) it’s a small lightweight personal computer that incorporates screen, keyboard, storage and processing components into a single portable unit, also referred to as a “laptop”. |

***9. Match these descriptions with the names of the keys in the box:***

|  |
| --- |
| *Arrow Keys ReturnEnter Backspace Caps Lock* *Shift Tab Delete Escape Space Bar* |

1. A long key at the bottom of the keyboard. Each time it is pressed, it produces a blank space (…).
2. It moves the cursor to the beginning of a new line. It is also used to confirm commands (…).
3. It stops the program without losing the information from the main memory. Sometimes its use depends on the application (…).
4. It works in combination with other keys to produce special characters or specific actions (…).
5. It removes the character on the right of the cursor or any selected text (…).
6. It produces UPPER-CASE characters or the upper-case character of the key (…).
7. It produces the upper-case letters, but it does not affect numbers and symbols (…).
8. It moves the cursor horizontally to the right for a fixed number of spaces (in tabulations and data fields) (…).
9. They are used to move the cursor as an alternative to the mouse (…).
10. It removes the character on the left of the cursor (…).
* **WORD-STUDY**

***1W. Translate the words of the same root. Define parts of speech:***

to inform – information – informative – informed;

to purpose – purpose – purposeful – purposely;

to complete – completion;

produce – product – production;

to require – requirement – required;

to perform – performance – performer;

to create – creation – creative – creator;

to store – storage – stored;

to develop – development – developed;

logic – logical – logician;

to provide – provider – provision – provided;

 to add – addition – additional - additionally.

***2W. Fix your attention to negative prefixes. Translate the words.***

understand - misunderstand

place - misplace

read - misread

shelve - misshelve

reparable - irreparable

responsible - irresponsible

regular - irregular

***3W Find synonyms:***

|  |  |
| --- | --- |
| a) set upb) holdc) stepd) feede) executef) viag) currentlyh) attachi) providej)main | 1) connect2) input3) chief4) contain5) by means of6) give7) now8) install9) perform10) operation  |

***4WChoose the right word.***

*origin — original (adj.) — original (n.) — originally — originate*

1. The vapour occupies the space … filled with liquid. 2. There are words whose … is not conclusively established yet. 3. My father speaks English very well. He can fluently read Shakespeare in the … . 4. Coal may … from isolated fragments of vegetation. 5. The … structure of the crystal lattice changed as the result of the chemical reaction.

***Translate into English choosing the right word.***

1. Слово «комп’ютер» латинськогопоходження. 2. Телевізориспочаткубуличорно-білі. 3. Треба бути неабиякимзнавцемживопису, щобвідрізнитицюкопіювідоригіналу. 4. Сварка виникла через непорозуміння. 5. Цейматеріалнабуваєпочатковоїформи, коли тиск на ньогоприпиняється.

*solve — decide solution — decision*

1. We know enough to … a question like this. 2. Last night they came to a … that suited everybody. 3. Without this information we could not … what to do next. 4. This problem seems not to have a … . 5. At the age of 50 she left her country forever, although she came to this … with difficulty.

***Translate into English choosing the right word.***

1. Він продав будинок, хочацебулонелегкерішення. 2. Цю задачу можнарозв’язати за допомогоюкомп’ютера. 3. Розв’язанняцієїзадачі, запропонованемаловідомиманглійськимвченим, булодоволіоригінальним. 4. Прислухатися до моєїпоради, чині — це вам вирішувати. 5. Продатибудинок? Ценевирішенняпроблеми.

***Additional texts***

**BRIEF HISTORY OF THE COMPUTER INDUSTRY**

In 1822 Charles Babbage, professor of mathematics at Cambridge University in England, created the “Analytical engine”, a mechanical calculator that could automatically produce mathematical tables, a tedious and error-prone manual task in those days. Babbage conceived of a large-scale, steam-driven model, that could perform a wide range of computational tasks. The model has never been completed as revolving shafts and gears could not be manufactured with the crude industrial technology of the day. By the 1880s manufacturing technology had improved to the point that practical mechanical calculators, including versions of Babbage's Analytical engine, could be produced. The new technology achieved worldwide fame in tabulating the US Census of 1890. The Census Bureau turned to a new tabulating machine invented by Herman Hollerith, which reduced personal data to holes punched in paper cards. Tiny mechanical fingers "felt" the holes and closed an electrical circuit that in turn advanced the mechanical counter. Hollerith's invention eventually became the foundation on which the International Business Machines Corporation (IBM) was built.

Analog and digital calculators with electromechanical components appeared in a variety of military and intelligence applications in 1930s. Many people credit the invention of the first electronic computer to John Vincent Atanasoff. He produced working models of computer memory and data processing units at the University of Iowa in 1939 although had never assembled a complete working computer.

World War II prompted the development of the first working all-electronic digital computer, Colossus, which the British secret service designed to crack Nazi codes. Similarly, the need to calculate detailed mathematical tables to help aim cannons and missiles led to the creation of the first, general-purpose computer, the electronic numerical integrator and calculator ENIAC at the University of Pennsylvania in 1946. After leaving their university (arguing over the patent rights) developers of ENIAC, J. Prosper Eckert and John Mauchly, turned to business pursuits. They also had an ugly scandal with an academic colleague, John von Neumann, whom they accused of having unfairly left their names off the scientific paper that first described the computer and allowed von Neumann to claim that he had invented it. Eckert and Mauchly went on to create UNIVAC for the Remington Rand Corporation, an early leader in the computer industry. UNIVAC was the first successful commercial computer, and the first model was sold to the US Census Bureau in 1951.

**ADVANTAGES IN MAKING COMPUTERS OF SMALL**

**SIZE**

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

But weight is not the only factor. The smaller the computer, the faster it can work. The signals go to and fro at a very high but almost constant speed. So if one can scale down all dimensions to, let us say, one tenth, the average lengths of the current-paths will be reduced to one tenth. The speed of operation is scaled up to 10 times. Other techniques allow even further speed increases. Another advantage is that less power is required to run the computer. In space vehicles and satellites this is an important matter; but even in a trial application we need not waste power. Sometimes a computer takes so much power that cooling systems which require still more power have to be installed to keep the computer from getting too hot, which would increase the risk of faults developing.

Another advantage is reliability. Minicomputers have been made possible by the development of integrated circuits. Instead of soldering bits of wire to join separate components such as resistors and capacitors sometimes in the most sophisticated networks, designers can now produce many connected circuits in one unit which involves no soldering and therefore no risk of broken joints at all. If one of the component circuits develops a fault, all that is needed is to locate the faulty unit, throw it away and plug in a new one.

**UNIT 3.**

**HARDWARE**

1. ***Learn the basic vocabulary terms:***

|  |  |
| --- | --- |
| to attach – приєднуватиaccessarm– вибірковий важіль toboost – сприятиboot – перезавантаження bus – шина address bus – carries the ADDRESS of the instruction or datadata bus – carries data between processor and the memorycache – надоперативна пам’ятьcontrol bus – sends control signals such as: memory read, memory writecircuitboard – плата clockspeed – тактова частота chipset – набір мікросхем  | tocomprise – включати expansioncard – карта розширення toenable – давати можливістьfirmware – вбудоване програмне забезпеченняhardwired– апаратний, вшитийtohandle – обробляти installation – установка instructionregister – регістр командtopopin – заглянути random access – довільний доступsolder – спайка toswap– замінюватиshot-circuit– коротке замикання tangibleobject – матеріальний об'єкт troubleshootingprocess – процес пошуку несправності upgrade – оновлення  |

ALU (arithmetic and logical unit) –арифметико-логічнийпристрій, АЛП

CPU (centralprocessingunit) – процесор

RAM (randomaccessmemory) – запамятовуючий пристрій з довільним доступом

ROM (read-only memory) – постійний запам'ятовуючий пристрій, ПЗП

PGA (pingridarray) – корпус інтегральних схем

SPGA (staggeredpingridarray) – ступінчаста матриця приводів контакти на якому розташовані у шаховому порядку

QSOP (quarter size outline package) –корпусшириноюв ¼ дюйма

Сashe – «Кеш», проміжнапам'ять з великою продуктивністю

PCB (printed circuit board) - друкованаплата

I/O is an acronym for input / output

PC - program counter - stores address of the -> next <- instruction in RAM

MAR - memory address register - stores the address of the current instruction being executed

MDR - memory data register - stores the data that is to be sent to or fetched from memory

CIR - current instruction register - stores actual instruction that is being decoded and executed

ACC - accumulator - stores result of calculations

IR - interrupt register - manages requests from I/O devices.

1. ***Read and translate the text:***
2. **HARDWARE**

Computer systems consist of two main components: software and hardware. Computer software refers to the code instructions that tell the computer what to do, while computer hardware refers to the physical parts of the computer that you can see and touch.

Hardware consists of the components that do the actual work, everything from turning the system on to performing specific tasks. There are two types of hardware components: internal and peripheral. Internal components are the computer parts located inside the PC tower or the laptop body, and peripherals are located on the outside of the computer. The internal components are necessary to the basic running of a system and all computers have them; however, most peripherals are optional and can be modified by the user.

CPU or central processing unit is considered the brains of the operation.This unit is built into a single microprocessor chip which executes program instructions and supervises the computer's overall operation. The chip itself is a small piece of silicon with a complex electrical circuit called an integrated circuit.CPU consists of three functional units the control unit, arithmetic logic unit (ALU), and memory unit.



A control unit manages and coordinates the entire computer system. It has the following components:

a) a counter that selects the instructions, one at a time, from the memory;

b) a register that temporarily holds the instruction read from memory while it is being executed;

c) a decoder that takes the coded instruction and breaks it down into individual commands necessary to carry it out;

d) a clock, which produces marks at regular intervals.

This timing marks are electronic and very rapid.

ALU is made up of two words namely arithmetic unit and Logic Unit. Arithmetic unit works for all the operations like addition subtraction, multiplication, division etc. Whereas the logic unit responsible for performing logical operations such as comparing, selecting, merging & matching.

Memory unit is an important component of computer system. It is used to store program and data that are being used. It is also known as working area of a computer system. Main memory in the modern computer is built in the form of a chip. The chip is made of a semiconductor material. and consists of thousands or millions of cells. Each cell can store one bit 0 or 1. The cells in main memory are logically organized as groups of 8 bits. One group of 8bits is known as a byte. Each byte in the memory is assigned a unique number. This number is known as the address of the byte. No mechanical movement is required when data is accessed from main memory. That is why the main memory is very fast as compared to other storage devices. There are two types of memory known as RAM and ROM. ROM (Read Only Memory) is the computer’s permanent, long-term memory. It doesn't disappear when the computer is shut off. It cannot be erased or changed in anyway. However, there are types of ROM called PROM that can be altered. The P stands for programmable. ROM's purpose is to store the basic input/output system (BIOS) that controls the start-up, or boot process.

   RAM (Random Access Memory) is a working area where the operating system programs and data in current use are kept, ready to be accessed by the processor. It is the best-known form of computer memory. However, RAM, unlike ROM, is emptied when the computer is switched off. The more RAM you have, the quicker and more powerful your computer is.

  Cache (pronounced as "cash") is a buffer (made of a small number of very fast memory chips) between main memory and the processor. It temporarily stores recently accessed or frequently used data. Whenever the processor needs to read data, it looks in this cache area first. If it finds the data in the cache, then the processor does not need to do more time-consuming reading of data from the main memory. Memory caching allows data to be accessed more quickly.

Inside computers, there are many internal components. To communicate with each other they make use of wires that are known as a ‘**bus**’. The bus contains multiple wires (signal lines) that contain addressing information that describes the memory location of where the data is being sent or where it is being retrieved. Each wire in the bus carries a single bit of information, which means the more wires a bus has the more information it can address. There are three types of busses:

* Address Buss determines the location in memory that the processor will read data from or write data to.
* Data Bus carries the actual data between the processor, the memory and the peripherals.
* Control Bus manages the information flow between components indicating whether the operation is a read or a write and ensuring that the operation happens at the right time.

A motherboard acts as a platform for establishing connections between various components that are essential for the successful operation of a computer. A printed circuit board houses all the components, either soldered or connected discretely through expansion slots. The motherboard is sometimes alternatively known as the main board, system board, or, on Apple computers, the logic board. It is also sometimes casually shortened to “mobo”.

Hard disks are the main data storage area within your computer. The term “hard” is used to distinguish it from a soft or floppy disk. Hard disks hold more data and are faster than floppy disks.

***4. Answer the following questions:***

1. What is the main function of a computer’s processor?
2. What are the functional units of CPU?
3. What operations are performed by ALU?
4. What is the function of the system clock?
5. What is Memory Unit used for?
6. What are the differences between RAM and ROM?
7. What is a bus?
8. What is a bit?
9. What are the main types of busses?
10. What term is used to refer to the main printed circuit board?
11. What is hard disk?
12. What is the function of cache?

***5. Say if the statements are true or false***

* + - 1. There are two types of hardware components: internal and peripheral.
			2. CPU consists of four functional units.
			3. The function of a hard disk drive is to delete all the files stored on a disk.
			4. A control unit manages and coordinates the memory unit.
			5. The function of a decoder is to select the instructions from the memory.
			6. The capacity of memory is determined by the period of the time required for the signals to travel the distance from the memory to the arithmetic/logic unit.
			7. The CPU coordinates the activities taking place within the computer system.
			8. The arithmetic logic unit performs calculations on the data.
			9. 32-bit processors can handle more information than 64-bit processors.
			10. 'Permanent' storage of information is provided by RAM.
			11. A motherboard houses all the internal components of a computer.

***6. Give the Ukrainian equivalents to the following words and words combinations:*** computer case, connector, to install, wire, circuit board, connector, technician, upgrade, multitude, chassis, keyboard, replacement, troubleshooting Circuit board, complex, electronic systems, motherboard, logic board, calculations, chipset, controller, to mediate, bus, external peripherals.

***7. Give the English equivalents to the following words and words combinations:*** корпускомп'ютера, з'єднувач (роз'єм), встановити, монтажнаплата, з'єднувач, технік, картарозширення, оновлення, безліч, блок, клавіатура, заміна, провід (провідник).

***8. Match the terms with the appropriate definitions.***

|  |  |
| --- | --- |
| 1. digital device  | a) напівпровідниковийматеріал |
| 2. analog device  | b) заголовокфайла |
| 3. binary digit  | c) интегральнаясхема |
| 4. numeric data | d) цифровоеустройство |
| 5. character data  | e) представлениеданных |
| 6. extended | f) определять количество |
| 7. digitize | g) расширенный |
| 8. file header | h) символ, знак |
| 9. quantify | i) переводить в цифровую форму, оцифровывать  |
| 10. integrated circuit  | j) цифровые данные; числовые данные |
| 11. semiconducting material | k) двоичнаяцифра |
| 12. data representation | l) аналоговое (моделирующее) устройство |

***9. Complete the text with verbs from the box:8. Guess what is:***

|  |
| --- |
| measure expansion card  CPU graphics movies run processes motherboard RAM troubleshooting boots binary |

1. The \_\_\_ is the main IC chip on your computer’s --.
2. Most computers \_\_\_ the Microsoft Windows OS.
3. We \_\_\_ the size of the hard disk in gigabytes.
4. Watching \_\_\_ on the Internet needs a faster \_\_\_.
5. The CPU controls how fast the computer \_\_\_ data.
6. Programs with a lot of \_\_\_ need a large \_\_\_to run well
7. In a desktop computer, \_\_\_ can be added to a computer to upgrade an existing component or add new functionality to a computer.
8. As the computer \_\_\_\_ , parts of the operating system and drivers are loaded into memory, which allows the CPU to process the instructions faster.
9. The goal of \_\_\_\_\_ is to try to isolate the problem by eliminating the possible problems.
10. The language of the computer uses ones and zeros. Hardware can only understand \_\_\_.

***10. Complete the sentences according to the text:***

 1. All the wires, connectors \_\_\_\_ inside a computer sometimes tend to be a little intimidating. 2. A technician spent hours to search for a specific \_\_\_\_ or failed solder connection that’s causing a particular problem. 3. It’s quicker, easier, and much more economical to have\_\_\_\_ in a whole new video card or motherboard. 4. The term \_\_\_\_covers all those parts of a computer that are tangible objects. 5. A personal computer is made up of multiple\_\_\_\_\_ of computer hardware. 6. \_\_\_\_\_\_is the track location that cuts across all platters. 7. \_\_\_\_\_\_ is an item of factual information derived from measurement or research. 8. \_\_\_\_\_\_\_is a rigid magnetic disk mounted permanently in a drive unit. 9. \_\_\_\_\_\_\_is a unit of information equal to 1000 megabytes. 10. \_\_\_\_\_\_\_is one of the circular magnetic paths on a magnetic disk that serve as a guide for writing and reading data. 11. \_\_\_\_\_\_\_is a data storage medium that is composed of a disk of thin, flexible magnetic storage medium.

***11. Guess what it is:***

1) a device that can read and write to writable disks

2) a tool or a piece of equipment made for a particular purpose

3) the part of the computer that reads and stores information on disks

4) a machine that is connected to a computer and that prints on paper

5) the set of buttons (keys) that you press to operate a computer

6) a separate part of a PC with a large screen that shows information from the computer

7) a small device that you move across a surface to control the movement of the cursor

8) the general term used for a computer, which usually consists of a monitor, a keyboard and a mouse

9) any piece of hardware (= machinery, etc. that forms part of or is connected to a computer) apart from the CPU and the working memory (RAM)

10) a metal box that contains the CPU, hard disk drive and power supply for a PC

***12. Give the appropriate translation to the Ukrainian words.***

1. There are also комп’ютери загального призначення in the office, at home, and at school. 2. Twenty or thirty years ago, most books on computers описували великі, потужні машини, because they were the most common. 3. The basic parts of персональногокомп’ютера for the home are мікропроцесор і клавіатура. 4. All of these disk platters inside the sealed case обертаються з однаковою швидкістю but each disk has its own головкусчитываниязаписи. 5. Гнучкідиски are a form of портативногозапам’ятовувальногопристрою that can be inserted into a computer’s дисковод. 6. Typically, кожнийбайтзберігаєодинсимвол, using the same методдвоїчногокоду practiced in primary coding. 7. Інтегральнасхема constituted another важливийкрок in the growth of computer technology. 8. The method of обробкиданих as well as наявні периферійні пристрої define computer generations. 9. Різнобічність and convenience of the microprocessor has altered всюархітектуру of modern computer systems. 10. The speed of modern computers is the speed of зверненнядопам’яті.

***13. Choose the right word.***

1. Programs and data to be processed must be in the\_\_\_\_memory.

a) internal; b) external; c) secondary

2. The function of the control unit within the central processor is … coordinating control signals and commands.

a) to transmit; b) to change; c) to design

3. The control unit\_\_\_\_\_\_\_\_\_ instructions from the program.

a) sends; b) changes; c) obtains

4. Cache temporarily … recently accessed or frequently used data.

a) stores; b) changes; c) obtains

5. Pentium processors … faster than the numbered processors found in older computers

a) calculate; b) execute; c) run

6. A program will … faster if the movement of instructions and data between the main memory and the processor is minimized.

a) be obtained; b) be designed; c) be executed

7. A bus transaction … two parts: Issuing the command (and address) – request and transferring the data – action.

a) connects; b) includes; c) stores

8. A system bus … major computer components (processor, memory, I/O)

a) controls b) connects c) carries out

9. CU and ALU consist of electronic circuits with millions of\_\_\_\_\_\_ .

a) sensors; b) servers; c) switches

* **WORD-STUDY**

***1W. Translate the words of the same root. Define speech parts.***

to connect – a connector – connection – connectible;

to install – installation – an instalment;

a place – to place – to replace – a replacement;

a multiple – multiplication – to multiply – a multiplicator;

to perform – performance – a performer.

to expand – an expanse – expansible – an expansion – expansive;

to compute – a computer – computation;

to connect – a connector – connection;

to establish – an establishment – established;

to provide – providence – a provider – provident.

***2W. Findsynonyms:***

|  |  |
| --- | --- |
| character speed device keep image software storageoperatepartcomputer | picturemachineworkratecomponentstoreletterprogramhardwarememory |

***3W. Insert the words:***

*also — too — as well — either — neither*

1. My friend is … a software engineer. 2. My friend is a software engineer … . 3. My friend isn’t a software engineer … . 4. My friend isn’t a software engineer. … am I. 5. There were other software engineers at the conference … .

***Translate into English choosing the right word.***

1. Я тежбувприсутній на лекціїпрофесора Джонсона. 2. Я бувприсутній на тійлекціїтеж. 3. Я теж не бувприсутній на тійлекції. 4. Я не бувприсутній на тійлекції. — Я теж. 5. На лекціїпрофесора Джонсона булиприсутністудентиіншихфакультетівтакож.

*such as — so as*

1. Try to have everything ready … not to keep us waiting. 2. At the art exhibition we could see the canvases of famous British painters …Gainsborough, Reynolds, Constable, and Turner. 3. Don’t let your television blare … to disturb your neighbours. 4. She walked home the long way round … not to bump into anybody. 5. Ukraine is rich in mineral resources … iron, manganese, titanium ores, coal and others.

***Translate into English choosing the right word.***

1. Частинурозрахунків Джейн зробила сама задля того, абиполегшити роботу Роберту. 2. Ми попросили показати нам цейвузол у розрізі (sectionview), щобпобачитийоговнутрішнюбудову. 3. БританськаСпівдружність є об’єднанням (association), до якогокрімсамоїВеликоїБританіївходятьсувереннідержави, такі як Канада, Австралія, Нова Зеландія, Кенія та інші, більшістьізяких колись булибританськимиколоніями. 4. Ті, хтоспізнився, заходили до аудиторіїдуже тихо, аби не заважатилекторові. 5. Національнийавіаційнийуніверситетготуєфахівцівізрізнихгалузей, таких як авіація та космонавтика, комп’ютерні науки, радіоелектроніка, економікатощо. 6. Вінпідвівся, щобикраще

бачити те, щовідбувалося на футбольному полі.

***3W. Summarize your knowledge on the meaning of "as". Translate the sentences paying special attention to different meanings of "as".***

1. As we know the first personal computer of new type appeared in 1972. 2. As the manufacturing technology had improved, mechanical calculators could be produced. 3. Software and peripherals were compatible with all versions and with earlier models as well. 4. At that time Babbage worked as a professor of mathematics at Cambridge. 5. Peripheral equipment is slow as compared with computers. 6. As for the first personal computer Altair, it appeared in 1975. 7. In 1976 Steve Jobs as well as Stephen Wozniak began assembling a microcomputer.

***4W. Summarize your knowledge on “the … the” construction***.

1. The more up-to-date computers a Research Institute uses, the more progressive it is believed to be. 2. The more we study human brain, the better we realize that no computer can be equal to it. 3. The younger a child is, the less time he/she should work with a computer. 4. The longer you study a subject, the more interested in it you become. b) Finish the sentences given below. 1. The harder you work, … 2. The more we have, … 3. The less you know about a problem, … 4. The longer we live, …

***5W. Translate into English:***

1. ЯкщоуВасмалооперативноїпам'ятііневеликийфайлпідкачки, то вимогливіпрограми таігриможутьгальмувати. 2. Оцінитизавантаженняпроцесора і дізнатися, якіпрограми в даний момент працюють, можна за допомогою диспетчера завдань. 3. Поті́кда́них (англ. datastream) в телекомунікаціях і програмуванні — цепослідовністькодованихкогерентнихсигналів в цифровійформі, яка використовується, щобпередаватиабоотриматиінформацію. 4. Регі́стрпроце́сора — коміркашвидкодійноївнутрішньоїпам'ятіпроцесора 5. Всіобчислення компьютеравиконують за допомогою центрального процесора. 6. Тактова частота процесора - це один з найбільшважливихпараметрів, щохарактеризуютьперсональнийкомп'ютер, а такожвсііншіпристрої, побудовані за його принципом. 7. Чипсе́тце набірмікросхем, призначених для спільноїроботи з метою виконання набору заданих.

***6W. The table gives some prefixes commonly used in computer science. Knowing the meaning of these prefixes will help you understand new words:***

|  |  |  |
| --- | --- | --- |
|  Prefix | Meaning | Examples |
| deci- | ten | decimal, decimalize, decibel |
| hexadeci- | sixteen | hexadecimal |
| kilo- | one thousand (1,000)(1,024 in binary: 210) | kilocycle, kilogram(me), kilowatt |
| mega- | large; one million | megahertz, megalith, megaton |
| giga- | very large; one thousand million | gigantic, gigabyte, gigahertz |
| mini- | small | minibus, minimum, minimize |
| micro- | very small | microfilm, microphone, microwave |
| bi- | two | bidirectional, bidimensional, binary |
| tri- | three | tripartite, tricycle, trilingual |
| multi- | many | multi-racial, multi-user, multitasking |
| mono- | one | monologue, monosyllable, monolingual |

***7W. Complete these descriptions with the correct unit of memory.***

1. A\_\_\_\_ is about one trillion bytes – about as much text as the books and magazines in a huge library. 2. A\_\_\_\_\_ is about one million bytes – about as much text as a 300-page novel. 3. A\_\_\_\_\_ is about one billion bytes – about as much text as 1,000 books. 4. A\_\_\_\_\_ is about one 44 thousand bytes – equivalent to one sheet of A4. 5. A\_\_\_\_\_\_ can store a single character, such as the letter h or number 7.

***8W. Complete each sentence choosing the correct preposition from the box.***

|  |
| --- |
| Outside between into in from to from alongInto from inside into across to from to into |

1. The CPU is a large chip ......... the computer. 2. Data always flows ......... the CPU ......... the address bus. 3. The CPU can be divided ......... three parts. 4. Data flows ......... the CPU and the memory. 5. Peripherals are devices ......... the computer but linked ......... it. 6. The signal moves ......... the VDU screen ......... one side ......... the other. 7. The CPU puts the address ......... the address bus. 8. The CPU can fetch data ......... memory ......... the data bus. 9. A program is read ......... disk .......... memory. 10. The hard disk drive is ......... a sealed case. 11. Tracks are divided ......... sectors.

* ***Additional texts***

*(Text 1*) **MOTHERBOARD**

A motherboard (also called mainboard) has been an integral part of most personal computers for more than 20 years. It is a multi-layered printed circuit board. Copper circuit paths called traces that resemble a complicated roadmap carry signals and voltages across the motherboard. Layered fabrication techniques are used so that some layers of a board can carry data for the input/output, processor and memory buses while other layers can carry voltage and ground returns without circuit paths short-circuiting at intersections. The insulated layers are manufactured into one complete, complex "sandwich." The motherboard is the data and power infrastructure for the entire computer. Various circuit cards performing various functions all plug into many similar sockets on a common circuit board. Each circuit card performs a unique function in the computer and gets its power from the socket as well.

Different motherboards of different vintages typically have different form factors. Form factor essentially means the size and shape of the actual motherboard. There are more than a half-dozen form factors for motherboards, with the most recent ones having the designation of NLX. Right now, the designation ATX is the most prevalent. By buying a computer with a true ATX motherboard, you are assured that you will have the ability to upgrade by being able to re-use the personal computer case with a more recent replacement ATX board design. Motherboards have helped to keep the "personal" in personal computing since pluggable components allow the user to personalize the system depending on their applications and needs. For example: prolific collectors of digital camera images or video will want to add a SCSI hard disk drive to an open bay and use an empty socket on the motherboard for the SCSI controller card; serious game enthusiasts will want the fastest video card possible with as much memory on the card as possible.

*(Text 2*) **COMMON MOTHERBOARD ITEMS**

*CPU (central processing unit) or microprocessor*is the brain of the computer.It reads and interprets software instructions and coordinates the processing activities that must take place. All computer components channel data and instructions to and from the CPU.

*RAM (random-access memory)*is slots or sockets and integrated circuits or chips surface-mounted on small circuit boards. The more RAM you can install in a computer (up to the maximum supported by the system), the better. RAM enables a computer to store actively running applications and their data without swapping out to the hard disk drive. It’s a volatile type of memory.

*Cache socket.*This socket is reserved for a Level 2 cache (L2, cache memory that can be accessed more quickly than the primary cache) or secondary cache memory module. L2 cache consists of fast memory called SRAM (static RAM). Computers with L2 cache perform better than those that lack L2 cache. This cache stores operations or data recently accessed by the CPU, allowing the processor to retrieve this information much more quickly than if the data resided in conventional RAM.

*System chipset*isalso called the "support chipset." This collection of logic circuits is responsible for transferring information to and from all other motherboard circuits, adapter card connectors, and disk drives. Chipset specifications allow for compatibility with PCI (Peripheral Component Interconnect) and ISA (Industry Standard Architecture) buses and the IDE (Integrated Drive Electronics) disk storage interface.

*Expansion bus slots*typically include PCI, ISA, and AGP (Accelerated Graphics Port) connectors for adapter cards designed to handle audio, video, and other subsystems. Once added, adapter cards fasten to the back of the case with a screw. Without slots, a computer would be limited to the circuitry permanently wired to the motherboard.

*Disk interface*presents connectors for floppy diskette and IDE hard disk drives. You attach a ribbon cable from a disk interface connector on the motherboard to the hard drive or floppy drive.

*Miscellaneous I/O*(*input/output) ports and connectors.*These devices get their name because information is sent in and out of them. Previously there were a lot of different cables to be connected to the board. Newer computers eliminate the need for cables because the connectors are integrated on the board. Modern motherboards also have hardwired USB (Universal Serial Bus) connectors letting you attach USB devices to the computer's back panel. A mouse connector on the motherboard cables to a PS/2-style port at the back of the computer for input devices such as a mouse or trackball. A keyboard connector (typically hardwired to the motherboard) cables to a keyboard port at the panel at the back of the computer so you can attach a keyboard.

*The BIOS (Basic Input/Output System) chip* holds the code that starts up your computer. Newer systems have a flash BIOS, storing the code on EPROM (erasable programmable read-only memory; memory that can be erased when exposed to ultraviolet light), so users can update a system's existing BIOS with new code.

*Miscellaneous parts.*This category includes the CMOS (complementary metal-oxide semiconductor, an electronic component used for RAM and fast data switching), real-time clock (the battery-powered device that keeps track of system time and date), plus several configuration jumpers and switches, power connectors, light-emitting diodes, and front-panel electrical connectors.

As the motherboard works, data and timing signals transfer from one connected component to the other by way of interconnected leads etched into the board. These leads are known as the system bus. The power supply, which also connects to the motherboard, distributes power to all system components via the bus. The processor also communicates with motherboard components by sending and receiving instructions and data over the bus.

*(Text 3*) ***DUAL-CORE PROCESSORS***

Dual-core refers to a CPU that includes two complete execution cores per physical processor. It combines two processors and their caches and cache controllers onto a single integrated circuit (silicon chip). It is basically two processors, in most cases, residing side-by side on the same die.

Dual-processor (DP) systems are those that contain two separate physical computer processors in the same chassis. In dual-processor systems, the two processors can either be located on the same motherboard or on separate boards. In a dual-core configuration, an integrated circuit (IС) contains two complete computer processors. Usually, the two identical processors are manufactured so that they reside side-by side on the same die, each with its own path to the system front-side bus. Multi-core is somewhat of an expansion to dual-core technology and allows for more than two separate processors.

A dual-core processor has many advantages especially for those looking to boost their system’s multitasking computing power. Dual215 core processors provide two complete execution cores instead of one, each with an independent interface to the front-side bus. Since each core has its own cache, the operating system has sufficient resources to handle intensive tasks in parallel, which provides a noticeable improvement to multitasking.

Complete optimization for the dual-core processor requires both the operating system and applications running on the computer to support a technology called thread-level parallelism, or TLP. Thread-level parallelism is the part of the OS or application that runs multiple threads simultaneously, where threads refer to the part of a program that can execute independently of other parts. Even without a multithread-enabled application, you will still see benefits of dual-core processors if you are running an OS that supports TLP. For example, if you have Microsoft Windows XP (which supports multithreading), you could have your Internet browser openalong with a virus scanner running in the background, while using Windows Media Player to stream your favorite radio station and the dual-core processor will handle the multiple threads of these programs running simultaneously with an increase in performance and efficiency.

Today Windows XP and hundreds of applications already support multithread technology, especially applications that are used for editing and creating music files, videos and graphics because these types of programs need to perform operations in parallel. As dual-core technology becomes more common in homes and the workplace, you can expect to see more applications support thread level parallelism. Intel & AMD Dual-core Desktop Processors. The Intel PentiumProcessor Extreme Edition 840 running at 3.2 GHz and Intel 955X Express Chipsets are being built into computers that are now entering the market. This is Intel’s first desktop dual-core product supporting Hyper-Threading Technology. Processor features include the following:

• Hyper-Threading Technology: enables you to run multiple demandingapplications at the same time.

• Intel Extended Memory 64 Technology: provides flexibility forfuture applications that support both 32-bit and 64-bit computing.

• Dual-Core: two physical cores in one processor support bettersystem responsiveness and multi-tasking capability than a comparablesingle core processor.

**UNIT 4**

**PERIPHERALS**

***1. Learn the basic vocabulary terms:***

|  |  |
| --- | --- |
| amplifier – насадна лінзаan application – 1. прикладнапрограма2. додаток, застосуванняbar code – штриховий код badge reader – пристрійчитанняідентифікаційнихкартокcordless – бездротовийadesktop– настільний комп'ютерtohighlight– виділяти (частини тексту абографічногозображення на екрані дисплея)to issue command – подавати командуtoinstall – встановлюватиakeypad – допоміжна клавіатураnetworkinterface –мережевий інтерфейс | peripherals – зовнішнє обладнанняpad   1. допоміжна клавіатура 1. (графічний) планшет

aplug –штепсель, штекерremovable – знімний, заміннийastrip – смужкаastripcode – штриховий кодaslot–ділянка (складеноїструктуриданих) asocket – гніздоspeakers– колонкиatrackball – кульовий маніпулятор atrackpad – сенсорна панельaUSBhub – usb-перехідник |

***2. Read and translate the text:***

**Input and Output Devices**

A computer will be of no use if it is not communicating with the external world. So, it has to have a system to receive information from the outside world and must be able to communicate results to the external world. Thus, a computer consists of input/output devices. Input and output devices can also be written as I/O devices. These input/output devices are also known as peripherals since they surround the CPU and memory of a computer system.

Input devices are needed so that data can be entered into the computer system, to be stored or processed. Input devices may be classified into manual and automatic. The most common manual input devices are typewriter-like keyboards, mouse, trackball, joystick, trackpad, and special pen with pressure-sensitive pad; microphones, and digital cameras. Automatic data input methods are methods where data is collected and processed and prepared beforehand in some way so that it can be directly entered into a computer system when needed.Examples of automatic input devices are: Barcode readers, Magnetic Ink Character Recognition (MICR), **Magnetic stripe cards and smart cards.**

**Keyboard.** It is the most common input device used for entering data and information into the computer system. The keyboard is a primary device for inputting text by pressing a set of keys. All the keys are neatly mounted in a keyboard connected to the computer system. Keyboard devices can be classified into two types general purpose keyboards and special purpose keyboards. General purpose keyboard are standard keyboards used with most computer system. They are called general purpose because they have enough keys to make them useful for any type of application.

**Mouse.** The mouse is a small device used to control the movement of the pointer on the screen when it is moved horizontally over a flat surface. Buttons on the mouse let you select options from the menus and drag objects around the screen. Some models are now wireless.

**Joystick**. The joystick is a vertical stick which moves the graphic cursor in a direction the stick is moved. It typically has a button on top that is used to select the option pointed by the cursor. Joystick is used as an input device primarily with video games, training simulators and controlling robots.

**Trackball.** Trackball is used to enter motion data into computers or other electronic devices. It serves the same purpose as a mouse but is designed with a moveable ball on the top, which can be rolled in any direction. Instead of moving the whole device, you simply roll the moveable ball on top of the trackball unit with your hand to generate motion input. Like mice, computer trackball devices also include buttons, which can serve as left-click and right-click buttons and may also be used to enter other commands.

**Scanner.** A scanner is a device that takes a picture of an image that exists outside the computer, such as a photograph or a drawing on paper. As the scanner takes the picture, it digitizes the image (breaks it up into dots that can be recreated on the computer screen with electronic signals) and send this digital information to the computer as a file. Then you can take this file of the scanned image and use it in your work.

**Touch screens.** Touch screens are monitors / electronic visual display screens which detect where they are being touched. The user makes selections by directly touching the screen, rather than moving a cursor to the point on the screen with a mouse or joystick

**Bar codes**. A bar code is a set of lines of different thicknesses that represent a number. Bar Code Readers are used to input data from bar codes. Most products in shops have bar codes on them. Bar code readers work by shining a beam of light on the lines that make up the bar code and detecting the amount of light that is reflected back

**Light Pen**. It is a pen shaped device used to select objects on a display screen. It is quite like the mouse (in its functionality) but uses a light pen to move the pointer and select any object on the screen by pointing to the object. Users of Computer Aided Design (CAD) applications commonly use the light pens to directly draw on screen.

**Magnetic stripe cards and smart cards.** Data can be entered into computer systems by using cards that have a magnetic stripe on them. The magnetic stripe holds coded information. This can be retrieved by 'swiping' the card through a magnetic card reader. The information can then be used directly or used to retrieve more information from a central computer.

**Magnetic Ink Character Recognition (MICR)**. When banks produce cheque books, they print on the bottom of the cheque the sort code of the bank, the account number and the cheque number. These numbers are printed in magnetic ink because the cheques can then be read automatically once a cheque has been written. It doesn't matter if the cheque gets creased or a little dirty because the data on them can still be read by the special magnetic ink readers.

An output device is any piece of computer hardware equipment used to communicate the results of data processing carried out by an information processing system (such as a computer) to the outside world. One of the most important output devices in computer system is its screen commonly called monitor. It is an output device that displays all the programs and applications which are running on the computer system. It displays images generated from the video output without keeping a permanent record.

Printers are used for producing output on paper. There are a large variety of printers and printing devices which can be classified according to the print quality and printing speed. Computer speakers, or multimedia speakers, are external speakers, commonly equipped with a low-power internal amplifier which produces sound as output. External speakers are connected with a computer by using a plug and socket.

Some devices, such as video display terminals and USB hubs, may provide both input and output. Other examples are devices that enable the transmission and reception of data between computers – e.g., modems and network interfaces.

***3. Answer the following questions:***

1. Why is it important for a computer to have input/output devices?
2. What is the general purpose of the input unit?
3. What is the general purpose of the output unit?
4. What are the two main types of keyboard devices?
5. What is the general purpose of buttons on the mouse?
6. How does scanner work?
7. What is a touch screen?
8. How does a mouse work?
9. How do manual input devices differ from and automatic?
10. What is the difference between a mouse and a light pen?
11. Is USB hub an input or output device?

***4. Say if the statements are true or false:***

1. Cordless mice are directly connected with computer.
2. Mechanical mice use laser rays for movement.
3. Printer is used to display pictures.
4. Monitor is used to scan pictures.
5. The purpose of the input devices is to collect data.
6. Scanner is used to input graphics only.
7. Trackball is used to take a picture of an image that exists outside the computer.
8. Joystick is used as an input device for controlling robots.
9. Monitor is an output device.
10. Bar code readers work by the sound.

***5. Complete this text about the mouse with verbs from the box:***

|  |
| --- |
| Click double-click drag grab select move control |

A mouse allows you to (1)\_\_\_the cursor and move around the screen very quickly. Making the same movements with the arrow keys on the keyboard would take much longer. As you (2) \_\_\_the mouse on your desk, the pointer on the screen moves in the same direction. The pointer usually looks like an arrow, or a pointing hand, depending on what you are doing. A mouse has one or more buttons to communicate with the computer. For example, if you want to place the insertion point or choose a menu option, you just (3) \_\_\_\_(press and release) on the mouse button, and the option is chosen. The mouse is also used to (4) \_\_\_\_\_text and items on the screen. You can highlight text to be deleted, copied or edited in some way. The mouse is widely used in graphics and design. When you want to move an image, you position the pointer on the object you want to move, press the mouse button, and (5) \_\_\_\_\_ the image to a new location on the screen. Similarly, the mouse is used to change the shape of a graphic object. For example, if you want to convert a square into a rectangle, you (6)\_\_\_\_one corner of the square and stretch it into a rectangle. The mouse is also used to start a program or open a document: you put the pointer on the file name and (7)\_\_\_\_on the name — that is, you rapidly press and release the mouse button twice.

***6. Match the terms with the appropriate definitions.***

|  |  |
| --- | --- |
| 1. trackball
2. touchscreen
3. speakers
4. scanner
5. optical mouse
6. microphone
7. laser printer
8. keyboard
9. inkjet printer
10. 3D printer
 | 1. An output device that can generate a three-dimensional (3D) physical object
2. An output device for printing pages using ink cartridges
3. An input device that allows text characters and symbols to be entered into a computer system
4. An output device for printing pages that uses toner cartridges
5. An input device that allows sound to be entered into a computer system
6. An input device that is used to move a pointer on a screen
7. An input device that takes physical printed information and converts it into a digitized format
8. Output devices that produce sound
9. Both an input and an output device: the display outputs an image; it can receive inputs by being touched by either a finger or a stylus
10. An input device that moves a pointer on a screen when a ball on the device is rolled or moved
 |

***7. Arrange (a) synonyms and (b) antonyms in pairs and translate them:***

a) speed; peripheral; to control; to write; auxiliary; to do; to receive; rate; to record; to get; to make; to handle; device; unit; instruction; part; to accept; command; section; information; data; to take in;

b) to add; presence; hole; input; north; decimal; to multiply; to divide; binary; south; output; blank; absence; to subtract.

***8. Fill in the blanks with the words from the box.***

|  |
| --- |
| printers software capacity drive pixels scanner peripherals bar code removable |

1. Digital cameras can be attached to a computer to directly transfer pictures for editing using special … and unwanted pictures can be deleted. 2. The resolution of a camera is measured in … and given as two numbers. 3. Other factors that vary between storage devices include: the speed at which the … moves the media past the read/write head and reads or writes data to the storage media and the … of the media. 4. There are various types of … for out-putting text and graphics to paper. 5. Data can take many forms and there is a wide variety of input, output, storage and communication …. . 6. … is an input device that acts like a miniature photocopy machine connected to a computer, copying graphic images into the computer and allowing type- written pages to be entered without retyping. 7. … reader is used for looking up prices. 8. … storage enables the user to change the media and transfer it to another computer.

***9. Fill in the blanks in the sentences with the necessary word(s); all the letters of the word(s) are given on the right.***

|  |  |
| --- | --- |
| 1. Some … are designed to avoid wrist and injures caused by hours of keyboarding. | OAYEDSBKR |
| 2. Certain input devices record and … the sound of the human voice into … signals. | TRNVOECTIIGDLA |
| 3. Some input systems … a computer to understand a voice it has never heard. | WOLLA |
| 4. The first generation of digital cameras could create photos with … of 650 x 480 pixels. | ULOOESRNTI |
| 5. An optical mouse requires less …; you can … it on any kind of surface. | EANEACINNTMEANALMPIUT |
| 6. Even a steady image on a monitor is constantly regenerated, or …*,* from top to bottom. | DEEFHRRES |

***10. Match the beginnings and the endings of the statements given and put the sentences you get into the correct order.***

|  |  |
| --- | --- |
| A touchscreen is a bit like an invisible | to turn computer information into a human friendly/readable form. |
| The objective ofoutput devices is | inallfourdirections. |
| Thanks to the development of LCD technology | keyboard glued to the front of your computer monitor. |
| Laser printers are ideal for | display screens now require less power and are lighter |
| The veryfirstcomputers | highvolumeprinting |
| The joystick can be moved | accepted "punch cards" as input. |
| A mouse can be used  | to control the position of the cursor on the screen |

***11. Fill in the gaps in the text with appropriate words.***

Most computer systems include a keyboard and some type of \_\_\_ device for basic data input. A mouse is standard equipment with most desktop computer systems. For output, most computers include a display device. A \_\_\_ produces an image by spraying electrons toward the screen. \_\_\_ technology produces an image by manipulating light within a layer of liquid crystal cells. \_\_\_ screen technology creates an on-screen image by illuminating miniature fluorescent lights arrayed in a panel-like screen. Image quality for a display device is a factor of screen size, \_\_\_ \_\_\_, \_\_\_ of viewing angle, resolution, refresh rate, and color \_\_\_.

***12. Fill in the blanks with the words from the box.***

|  |
| --- |
| *characters employs laser adapted data advanced* *letter-quality impact inkjet written dot-matrix output form* |

A printer is a computer 1.\_\_\_\_ device that displays information on paper. The information can be in the form of 2.\_\_\_\_ script, numerical 3.\_\_\_\_ or graphics. Printers can produce 4.\_\_\_\_ print, like a typewriter. There are two main types of printers: 5.\_\_\_\_\_\_ printers and 6.\_\_\_\_\_\_ printers. Dot-matrix printer 7. \_\_\_\_ a matrix of small pegs that, hit from behind, 8.\_\_\_\_\_ a series of dots on paper. The dot-matrix printer can 9.\_\_ a wide variety of 10.\_\_\_\_\_ as well as graphics. Ink-jet printers can be 11. \_\_\_\_ to complex colour printing. The more 12. \_\_\_\_\_ type of printers is the 13. \_\_\_\_ printer which is capable of both black and white and colour printing.

***13. These sentences contain typical mistakes. Correct them.***

1. A mouse is a device which connected to the computer.

2. These are three main types of a peripherals.

3. Input devices refers to the computer components.

4. Data is processing by the CPU.

5. Printer is peripheral which produces a hard copy.

6. They make our interactions with computers easier.

7. These devices can describe as hard disks.

* **WORD-STUDY**

***1W. Translate the following sentences into Ukrainian trying to avoid translating the word thing.***

It’s a strange thing she knows nothing about that. 2. It is typical for Julia to think hard things about her daughter’s friends. 3. There, by the fire, they would often talk of one thing and another. 4. It appeared that he did not know a thing about computers. 5. I’m very sorry; I forgot to call you up. I was preparing my speech for today’s academic council, and I had my mind full of other things. 6. I have never seen such an absent-minded person as you are. You can never concentrate on the most important things! 7. It doesn’t mean a thing to me. 8. At my office I’ve got to sign papers, participate in the talks, discuss the terms of the contracts and do many other things. 9. This is the thing I don’t like about all this matter. 10. I’ll tell him about it, first thing tomorrow morning.

***2W.Choose the right word.***

*assume — know — think*

1. I … you’re here to learn English. 2. I … I should practice English every day, but I never seem to have the time. 3. He … an air of confidence in spite of his dismay. 4. Why do some people … they know what other people think about something? 5. I … English is a global language.

***Translate into English choosing the right word.***

1. Завжди добре подумай перед тим, як відповісти. 2. Припустимо, щокоженіз нас зробить одну й ту ж помилку в розрахунках. 3. Вони нашісусіди, але ми не знаємоїх. 4. Цягіпотезанабулаобґрунтованоговиглядупісляпроведеннянашоюлабораторією низки експериментів. 5. Ядумаю, типовинензнатицеправило.

*accept — except*

1. Everything is arranged ... for the tickets to the exhibition. 2. I always … good advice. 3. The authors do not … any responsibility for the content added by users. 4. I study every day … Sunday. 5. … whatever it is that is being heaped upon you due to your earlier non-appearance and get on with it.

***Translate into English choosing the right word.***

1. Усістуденти, крімНіка, отрималидипломи та запрошенняпрацювати в різнихвідділенняхнашоїкомпанії. 2. Щодня ми маємо по два практичнихзаняття, за винятком четверга, якийвважаютьлекційним днем. 3. Я можуприйнятитвоївибачення, але прошу тебе ніколибільше не робити так. 4. Наше керівництвоприймає на роботу лише людей іздосвідомроботи та вищоюосві-

тою. 5. Я завжди беру на себе відповідальність за свою команду, крімвипадків, коли треба прийматиколективнерішення.

***3W. Learn the following speech patterns.***

**A**

It is **worth pointing** out that your project is much better this time .

It is **worth noting** that you worked hard and achieved your goals.

This book is **worth** the reader’s attention.

If a job is **worth doing**, it is **worth doing** properly.

B

**One** might think it is impossible to use the computer without mouse.

**One** cannot always be right, can one?

It is not easy to convince **one** in the reality of these facts.

See those two girls? Helen is **the one** on the left.

Natural flowers are much better than artificial **ones**.

***4W. Begin the following sentences with the given expressions.***

A) be sure of, be fond of, be interested in, be engaged in, be proud of.

B) rely on, insist on, prevent from, succeed in, result in.

 A) … meeting his friends at the conference. … setting his business. … working day and night at the project. … surfing through the Net. … having found the solution for the problem.

B) … our going on with the work. … working out a new televised course. … using the Web as a tool for exchanging scientific information. … his having done everything well. … making a wrong decision.

***5W. Find synonyms***

|  |  |  |  |
| --- | --- | --- | --- |
| *Adverbs* 1. rapidly 2. actively 3. previously 4. truly 5. originally 6. in vain | a) actually b) likely c) essentially d) formerly  e) idly  f) quickly  | *Verbs* 1. predict 2. propose 3. extract from 4. protect 5. drop 6. advance7. fix up | a) correct b) spread c) defend d) derive from e) go down f) forecast g) offer  |

***6W. Arrange the sentences in their logical sequence using*** *so, as a result, after, before, etc.*

1. Cruise lines have Web pages showing various types of cruises. 2. These pages offer information concerning tours and hotel accommodations as well as forms of transportation. 3. Planning a vacation becomes now much easier. 4. Many cities sponsor Web pages as well. 5. Many Web sites can help you in planning your travel or give your ideas of places you should visit. 6. You can learn about restaurants, sightseeing and shopping opportunities.

***Additional texts***

Do you know what Mighty Mouse, Lisa Mouse and Bus Mouse mean? 55 The name given to Apple’s first multi-button mouse, was launched in 2005. This was the first mouse manufactured and sold by Apple Computers since the Lisa era in 1983 that contained more than a single button. The Mighty Mouse offers four separate button areas including a touch-sensitive top for both the left and right click, a 360-degree clickable scroll bar, and side squeeze buttons to instantly access the Mac OS X Dashboard or other customizable features. Currently the Mighty Mouse is available in both wired and wireless versions. Lisa Mouse is the name for the mouse that was distributed with Apple’s first mouse-controlled computer (pre-Macintosh) in 1983. The Lisa Mouse used a steel ball (instead of the rubber ball found in more modern mice), and was rectangular in shape with a raised front panel, and contained a single mouse button. A Bus mouse is connected to a computer via an expansion board. Another type of mouse was a serial mouse connected to a serial port. Serial mice were easier to install, but the advantage of bus mice was that they do not use up the serial port, so you could use the port for a different device. Bus mice are now obsolete. Hamster is the name given to a cordless mouse that operates through an infrared connection.

***1) Complete the sentences with the words from the box:***

|  |
| --- |
| taskbar, buttons, allows, to hover, choosing, represent, resident, user interfaces, touchscreen, Start button |

1. A mouse also has left and right ….
2. A bar, known as a …, is displayed along the bottom of the desktop showing what programs, files and folders are currently open.
3. A … allows the user to select icons and commands by touching the display screen with their finger instead of using a mouse.
4. At the far right of the taskbar is a special area called the system tray where icons are displayed showing what … programs are continuously running in the background e.g. the system clock or a sound volume control.
5. Graphical … were first introduced with the Apple Mac OS.
6. My Briefcase is a program that … the user to exchange files with a portable computer and to synchronise the files on each computer.
7. There is a … at the far left of the taskbar.
8. The user can close down the operating system by … the Shut Down option on the Start Menu.
9. Icons are pictures which … programs, folders, and files.
10. … is to hold the pointer over an icon.

***2) Read the article below and decide which of the expressions in the box best describe a graphical user interface (GUI):***

|  |
| --- |
| user-friendly slow attractive text-based complex graphics-based |

**GUIs**

The term user interface refers to the standard procedures the user follows to interact with a computer. A few years ago, the way in which users had access to a computer system was quite complex. They had to memorize and type a lot of commands just to see the content of a disk, to copy files or to respond to a single prompt. In fact, only experts used computers, so there was no need for a user-friendly interface. Now, however, computers are used by all kinds of people and as a result there is a growing emphasis on the user interface.

A good user interface is important because when you buy a program you want to use it easily. Moreover, a graphical user interface saves a lot of time: you don’t need to memorize commands in order to execute an application; you only have to point and click so that its content appears on the screen.

Macintosh computers – with a user interface based on graphics and intuitive tools – were designed with a single clear aim: to facilitate interaction with the computer. Their interface is called WIMP: Window, Icon, Mouse and Pointer and software products for Macintosh have been designed to take full advantage of its features using this interface. In addition, the ROM chips of a Macintosh contain libraries that provide program developers with routines for generating windows, dialog boxes, icons and pop-up menus. This ensures the creation of applications with a high level of consistency.

Today, the most innovative GUIs are the Macintosh, Microsoft Windows and OS/2’s graphical Presentation Manager. These three platforms include similar features: a desktop with icons, windows and folders, a printer selector, a file finder, a control panel and various desk accessories. Double-clicking a folder opens a window which contains programs, documents or further nested folders. At any time within a folder, you can launch the desired program or document by double-clicking the icon, or you can drag it to another location.

The three platforms differ in other areas such as device installation, network connectivity or compatibility with application program.

These interfaces have been so successful because they are extremely easy to use. It is well known that computers running under an attractive interface stimulate users to be more creative and produce high quality results, which has a major impact on the general public.

**UNIT 5.**

**STORAGE DEVICES**

1. ***Learn the basic vocabulary terms:***

|  |  |
| --- | --- |
| access - доступ, зверненняaddressable memoryасоціативна пам'ятьbinarynumbers - двійкове числоcache - надоперативна пам'ять,  буферcachecoherency -цілісність даних в кеш-пам'ятісell - елемент пам'ятіcontent -змістtwo’scomplement -доповняльний кодconsecutivebytes - послідовні байтиinformation content кількість інформації conventional – стандартний | todifferentiate – диференціювати, розмежовуватиdistinction – відмінністьtoerase – стирати, викреслюватиfirmware - 1. мікропрограмне забезпечення, мікропрограми 2. програма, записана в ПЗП, "зашита" програмаnotionally – теоретичноpre-loaded – попередньо завантаженийregister - регістрretain – зберігатиsignificance - важливість |

*Types of RAM*

DRAM – Dynamic RAM – must be constantly refreshed by the CPU or will lose contents

SDRAM – Synchronous dynamic RAM – synchronized by the system clock; faster than DRAM; expressed in megahertz/gigahertz

SRAM – Static RAM – faster than DRAM; retains contents without being refreshed by CPU

DDR-SDRAM – Double-data rate synchronous dynamic RAM

*Types of (ROM)*

PROM (Programmable read-only memory) – It can be programmed by user. Once programmed, the data and instructions in it cannot be changed.

EPROM (Erasable Programmable read only memory) – It can be reprogrammed.

EEPROM (Electrically erasable programmable read only memory) – The data can be erased by applying electric field, no need of ultraviolet light.

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

A computer’s memory can be viewed as a list of cells into which numbers can be placed or read. Each cell has a numbered “address” and can store a single number. The computer can be instructed to “put the number 123 into the cell numbered 1357” or to “add the number that is in cell 1357 42 to the number that is in cell 2468 and put the answer into cell 1595”. The information stored in memory may represent practically anything. Letters, numbers, even computer instructions can be placed into memory with equal ease. Since the CPU does not differentiate between different types of information, it is up to the software to give significance to what the memory sees as nothing but a series of numbers.

In almost all modern computers, each memory cell is set up to store binary numbers in groups of eight bits (called a byte). Each byte is able to represent 256 different numbers; either from 0 to 255 or -128 to +127. To store larger numbers, several consecutive bytes may be used (typicallytwo, four or eight). When negative numbers are required, they are usually stored in two’s complement notation. Other arrangements are possible but are usually not seen outside of specialized applications or historical contexts.

A computer can store any kind of information in memory as long as it can be somehow represented in numerical form. Modern computers have billions or even trillions of bytes of memory. The CPU contains a special set of memory cells called registers that can be read and written to much more rapidly than the main memory area. The registers are high-speed units of memory. One of the registers (the program counter, or PC) keeps track of the next instruction to be performed in the main memory. The other (the instruction register, or IR) holds the instruction that is being executed. There are typically between two and one hundred registers depending on the type of CPU. Registers are used for the most frequently needed data items to avoid having to access main memory every time data is needed. Since data is constantly being worked on, reducing the need to access main memory (which is often slow compared to the ALU and control units) greatly increases the computer’s speed.

Computer’s main memory comes in two principal varieties: random access memory or RAM and read-only memory or ROM. RAM can be read and written to anytime the CPU commands it, but ROM is pre-loaded with data and software that never changes, so the CPU can only read from it. ROM is typically used to store the computer’s initial start-up instructions. In general, the contents of RAM are erased when the power to the computer is turned off while ROM retains its data indefinitely. In a PC, the ROM contains a specialized program called the BIOS that orchestrates loading the computer’s operating system from the hard disk drive into RAM whenever the computer is turned on or reset. In embedded computers, which frequently do not have disk drives, all the software required to perform the task may be stored in ROM. Software that is stored in ROM is often called firmware because it is notionally more like hardware than software.

Flash memory blurs the distinction between ROM and RAM by retaining data when turned off but being rewritable like RAM. However, flash memory is typically much slower than conventional ROM and RAM, so its use is restricted to applications where high speeds are not required. In more sophisticated computers there may be one or more RAM cache memories which are slower than registers but faster than main memory. Generally, computers with this sort of cache are designed to move frequently needed data into the cache automatically, often without the need for any intervention on the programmer’s part.

***3. Answer the following questions:***

1. What type of memory is temporary?

2. What type of memory is permanent and includes instructions needed by the CPU?

3. How can RAM be increased?

4. How many digits does a binary system use?

5. What is a bit?

6. What is a collection of 8 bits called?

7. What code do computers use to make calculations?

8. What two states do electronic circuits differentiate?

9. How do computers represent characters?

10. What units are used to avoid complex calculations?

11. Do you know what ASCII – pronounced /'æski/ – stand for?

12. What memories are used in microcomputers?

***4. Say if the statements are true or false:***

1. Data go first to ROM within a computer’s memory hierarchy.
2. BIOS stands for binary inner outer stages.
3. Hard drive is a temporary storage area
4. The registers are high-speed units of memory.
5. IR holds the instruction that is being executed.
6. Flash memory is typically much faster than ROM and RAM
7. Computer memory is measured in terms of bits
8. A computer cache will hold data that is used most often to make it faster to access.
9. ‘Write-back’ cache allows the processor to write changes both to the cache and to main memory.
10. Software that is stored in ROM is often called firmware.

***6. Match the terms with the appropriate definitions.***

|  |  |
| --- | --- |
| 1. digital device  | a) полупроводниковыйматериал |
| 2. analog device  | b) заголовокфайла |
| 3. binary digit  | c) интегральнаясхема |
| 4. numeric data | d) цифровоеустройство |
| 5. character data  | e) представлениеданных |
| 6. extended | f) определять количество |
| 7. digitize | g) расширенный |
| 8. file header | h) символ, знак |
| 9. quantify | i) переводить в цифровую форму, оцифровывать  |
| 10. integrated circuit  | j) цифровые данные; числовые данные |
| 11.semiconducting material | k) двоичнаяцифра |
| 12. data representation | l) аналоговое (моделирующее) устройство |

***7. Fill in the blanks choosing from the variants given.***

1. Main memory … only a small amount of storage area for the data and instructions required by the CPU.

a) allows b) transforms c) provides d) rotate

2. To fabricate a chip, the conductive properties of selective parts of the … can be enhanced.

a) electrical pulses b) semiconducting mater c) digital devices d) binary numbers

3. Some chips on the motherboard are plugged into special sockets and connectors that … chips to be removed for repairs.

a) allow b) assign c) avoid d) include

4. Even embedded computers … maintenance by people.

a) transform b) range c) employ d) require

5. The most powerful computer systems with the fastest processing speed … supercomputers.

a) rotate b) are referred to as c) avoid d) include

6. Every key stroke on a keyboard … a letter symbol into a digital code that the machine can understand.

a) converts b) requires c) allows d) provides

7. Most computers … the simplest type of digital technology – their circuits have only two possible states.

a) assign b) employ c) require d) range

***8. Fill in the gaps in the text.***

Most of today’s computers are electronic, digital devices that work with data coded as binary digits, also known as \_­\_\_. To represent numeric data, a computer can use the \_\_\_ number system. To represent character data, a computer uses Extended \_\_\_, EBCDIC, or Unicode. These codes also provide digital representations for the numerals 0 through 9 that are distinguished from numbers by the fact that they are not typically used in mathematical operations. Computers also \_\_\_sounds, pictures, and videos into 1s and 0s. A \_\_\_ is a single 1 or 0, whereas a \_\_\_ is a sequence of eight 1s and 0s. Transmission speeds are usually measured in \_\_\_, but storage space is usually measured in \_\_\_ or gigabytes.

***9. Transform the following sentences without any change in meaning. Use the prompts as they are given (words in brackets, parts of sentences).***

1. A storage device is the mechanical apparatus for recording and restoring data from a storage medium (*retrieve*).

The user … .

1. Hard disks should be operated and moved with care (*handle*, *transport*).

One … .

1. The translation of the differences between pits and lands into binary numbers is provided by the lens (*translated*).

The … between pits and lands into binary numbers … .

1. Revolving hard disk platters on the spindle allows the disk drive to position read-write heads over specific data (*rotated*).

To position read-write heads over specific data … .

5. High capacities of hard disk are available due to the high density of particles on the disk surface. (*provides*)

High density of particles … .

6. You can gauge hard disk drive speed in revolution per minute (pm). (*tomeasure*)

Revolution per minute … .

7. On many computers before data is actually processed, it is moved from a disk to RAM using the storage technology (*processed*, *transfer*).

Before data is actually …, … .

* **WORD-STUDY**

***1W. Put a splash where the spaces are:***

Areyougoodatrememberingthings?CanyourememberalonglistofEnglishvocabularyquicklyandeasily?Iftheanswertothesetwoquestionsis’no,’helpmaybeathand.Anewstudysaysprettymuchanyonecanhaveanupgradedmemoryiftheytraintheirbrain.Scientistssaythatwecantrainourbraintobea”memoryathlete”justlikeathletestraintobechampions.NeuroscientistMartinDreslerwroteinthejournal”Neuron”thatjustsixweeksofbraintrainingcanturnpeoplewithaveragememoriesintopeoplewithanincredibleabilitytorememberthings.DrDreslerevensuggestedpeoplecouldtraintheirbraintoentertheWorldMemoryChampionshipsthatareheldinMarcheveryyear.DrDreslercomparedMRIscansofthebrainsof23oftheworld’stop50memorychampionswiththebrainsof”normal”people.Hesaid:”Wewereinterestedinwhatdifferentiatesmemorychampionsfromnormalpeople,likeyouandme.”Hewassurprisedtofindnodifferences.Thismadehimbelievewecanallbecomememoryathleteswiththerighttraining.Dreslerfoundthat40daysofdaily30-minutetrainingsessionsusingamemorytechniquecalledmnemonicsmorethandoubledaperson’smemorycapacity.Mnemonicsisanancientmemorydevicethathelpspeoplerememberthings,especiallyinlistform.Whoknows?Itcouldhelpyouwiththosewordsforyournextvocabularytest.

***2W. Choose the right word***

Are you good 1 remembering things? Can you remember a long list of English vocabulary 2? If the answer to these two questions is ‘no,’ help may be at 3. A new study says pretty much anyone can have an upgraded memory if they train their brain. Scientists say that we can train our brain to be a “memory athlete” 4 like athletes train to be champions. Neuroscientist Martin Dresler wrote in the journal “Neuron” that just six weeks of brain training can turn people with 5 memories into people with an incredible ability to remember things. Dr Dresler even suggested people could train their brain to enter the World Memory Championships that are 6 in March every year.

Dr Dresler compared MRI scans of the brains of 23 of the world’s 7 memory champions with the brains of “normal” people. He said: “We were interested 8 what differentiates memory champions from normal people, like you and me.” He was surprised to find no differences. This made him believe we can all become memory athletes 9 the right training. Dresler found that 40 days of daily 30-minute training sessions 10 a memory technique called mnemonics more than 11 a person’s memory capacity. Mnemonics is an ancient memory device that helps people remember things, especially in list 12. Who knows? It could help you with those words for your next vocabulary test.

1. (a)     at     (b)     for     (c)     by     (d)     on
2. (a)     easiest     (b)     easy     (c)     easily     (d)     easier
3. (a)     head     (b)     foot     (c)     hand     (d)     back
4. (a)     as     (b)     fair     (c)     such     (d)     just
5. (a)     verge     (b)     overage     (c)     average     (d)     outage
6. (a)     hold     (b)     held     (c)     holding     (d)     holds
7. (a)     height     (b)     top     (c)     leader     (d)     summit
8. (a)     at     (b)     in     (c)     on     (d)     of
9. (a)     at     (b)     of     (c)     with     (d)     by
10. (a)     user     (b)     used     (c)     usage     (d)     using
11. (a)     doublet     (b)     doubling     (c)     double     (d)     doubled
12. (a)     fern     (b)     farm     (c)     firm     (d)     form

***3W. Learn the following speech patterns. Make your sentences with the following patterns***

 A.

1. None of us knew **whether or not** there would be a meeting.
2. She is in doubt **whether or not** to accept a new job.
3. You’ll stay here **whether you like** it or not.

B.

1. Some people do not have confidence **when using** computers.
2. He often feels sleepy while watching TV or **after eating** a meal.
3. She is a terror **when roused**.
4. **When shaped** the diamond should be faceted.

***4W. Translate the sentences into Ukrainian. State the function of “would” in each sentence.***

Machine translation would be of enormous aid to science and technology. 2. It was clear that new branches would require novel ideas. 3. When the era of Web arrived, a smart inventor created a document which would give local and national weather forecasts with a click of a mouse on the map of the United States. 4. What would you rather do when you need to make a choice: ask a human expert or apply to a computer expert system? 5. If a system was completed with an audio analyzer, computer “ears” would hear the words spoken into its microphone. 6. While studying at the University we would often work in our computer laboratory. 7. Would you make a report on the outlook for the development of optical fiber?

***5W. Match up the words that are similar in meaning.***

|  |  |
| --- | --- |
| 1. rotate 2. allow3. employ4. require5. provide6. interpret | a) permit b) understandc) spind) ensure e) need f) apply |

***6W. Study the most popular compound computer terms. Translate them into Ukrainian.***

***GUIDELINES ON THE CURRENT TREATMENT OF COMPOUND COMPUTER TERMS.***

1. *In the following list, the two-word forms (shown first) are still more common, but the one-word forms are starting to take hold.*

file name OR: filename screen saver OR: screensaver

home page OR: homepage spell checker OR: spellchecker

menu bar OR: menubar voice mail OR: voicemail

1. *In the following list, the one-word forms (shown first) are more common, but the spaced or hyphenated forms are still being used.*

barcode OR: bar code logoff (n.) OR: log-off BUT: log off (v.)

handheld OR: hand-held logon (n.) OR: log-on BUT: log on (v.)

hardwired OR: hard-wired offline OR: off-line

offscreen OR: off-screen touchpad OR: touch pad

online OR: on-line touchscreen OR: touch screen

onscreen OR: on-screen wordwrap OR: word wrap

*c. In the following list, the two-word forms (shown first) are more common, but the hyphenated forms (which follow the standard rules) are also being used.*

dot matrix printers OR: dot-matrix printers

local area networks OR: local-area networks

wide area networks OR: wide-area networks

1. *In the following list, the hyphenated forms (shown first) are more common, but the solid or spaced forms (if given) are used in materials aimed at industry insiders.*

dot-com drop-down menu OR: dropdown menu

pop-up window pull-down menu OR: pulldown menu

read-only memory ink-jet printer OR: inkjet printer

write-only files random-access memory OR: random access memory

1. *The following compound words are solid except in a few special cases.*

backup (n. & adj.) BUT: back up (v.) lookup (n.) BUT: look up (v.)

desktop newsgroup uplink (n. & v.)

downlink (n. & v.) newsreader upload (n. & v.)

download (n. & v.) BUT: news server userid (derived from user ID)

keyword palmtop whois (derived from who is)

laptop toolbar workstation

1. *Compound words beginning with Web are usually two words.*

Web site Web server BUT: Webmaster

Web page Web browser Webcasting

Web surfer Web directory Webzine

Web index Web clipping Weblog

Web cam Web terminal Webinar

NOTE: The term Web site is still most commonly written as two words with a capital W. However, along with a few other Web compounds, it has started to appear as a solid word without an initial cap (website). In order to maintain a consistent style, it is better to retain the capital W until a majority of these terms (such as the World Wide Web and the Web) lose their initial cap as well.

1. *Compound words beginning with the prefix e are usually hyphenated.*

e-banking e-credit e-tail OR: e-tailing

e-book e-currency e-text

e-business e-dress (an e-mail address) e-wallet

e-cash e-lance e-commerce e-learning e-conomy e-money

The term e-mail can still be seen as E-mail (the original form of the word) and also as email (without the hyphen), but the hyphenated form is still the one most commonly used. In order to maintain a consistent style, it is better to retain the hyphen in e-mail until many of the other e words start to drop the hyphen as well.

1. *The prefix i (which refers to the Internet) appears both with and without a hyphen when it is attached to a base word.*

iPod i-Lighter

iMac i-Newswire

iTunes i-flex solutions

iPhone i-Safe

iTools BUT: I-80 (here I stands for Interstate)

1. *The prefix m (which refers to the use of mobile phones) is usually followed by a hyphen when it is attached to a base word.*

m-business m-commerce

* ***Additional texts***

*(Text 1*) **HOW DOES RAM WORK?**

The term random access as applied to RAM comes from the fact that any storage location, also known as any memory address, can be accessed directly. Originally, the term Random Access Memory was used to distinguish regular core memory from offline memory.

Offline memory typically referred to magnetic tape from which a specific piece of data could only be accessed by locating the address sequentially, starting at the beginning of the tape. RAM is organized and controlled in a way that enables data to be stored and retrieved directly to and from specific locations.Other types of storage - such as the hard drive and CD-ROM-- are also accessed directly or randomly, but the term random access isn't used to describe these other types of storage.

RAM is similar in concept to a set of boxes in which each box can hold a 0 or a 1. Each box has a unique address that is found by counting across the columns and down the rows. A set of RAM boxes is called an array, and each box is known as a cell. To find a specific cell, the RAM controller sends the column and row address down a thin electrical line etched into the chip. Each row and column in a RAM array has its own address line. Any data that's read flows back on a separate data line.

RAM is physically small and stored in microchips. It's also small in terms of the amount of data it can hold. A typical laptop computer may come with 8 gigabytes of RAM, while a hard disk can hold 10 terabytes.RAM microchips are gathered together into memory modules, which plug into slots in a computer's motherboard. A bus, or a set of electrical paths, is used to connect the motherboard slots to the processor.

A hard drive, on the other hand, stores data on the magnetized surface of what looks like a vinyl record. And, alternatively, an SSD stores data in memory chips that, unlike RAM, are nonvolatile, don't depend on having constant power and won't lose data once the power is turned off.

Most PCs enable users to add RAM modules up to a certain limit. Having more RAM in a computer cuts down on the number of times the processor must read data from the hard disk, an operation that takes longer than reading data from RAM. RAM access time is in nanoseconds, while storage memory access time is in milliseconds.

The amount of RAM needed all depends on what the user is doing. When video editing, for example, it's recommended that a system have at least 16 GB RAM, though more is desirable. For photo editing using Photoshop, Adobe recommends a system have at least 3GB of RAM to run Photoshop CC on a Mac. However, if the user is working with other applications at the same time, even 8GB of RAM can slow things down.RAM comes in two primary forms:

**Dynamic Random Access Memory (**[**DRAM**](https://searchstorage.techtarget.com/definition/DRAM)**)** makes up the typical computing device's RAM and, as was previously noted, it needs that power to be on to retain stored data.Each DRAM cell has a charge or lack of charge held in an electrical capacitor. This data must be constantly refreshed with an electronic charge every few milliseconds to compensate for leaks from the capacitator. A transistor serves as a gate, determining whether a capacitor's value can be read or written.

**Static Random Access Memory (**[**SRAM**](https://whatis.techtarget.com/definition/SRAM-static-random-access-memory)**)** also needs constant power to hold on to data, but it doesn't need to be continually refreshed the way DRAM does.In SRAM, instead of a capacitor holding the charge, the transistor acts as a switch, with one position serving as 1 and the other position as 0. Static RAM requires several transistors to retain one bit of data compared to dynamic RAM which needs only one transistor per bit. As a result, SRAM chips are much larger and more expensive than an equivalent amount of DRAM.However, SRAM is significantly faster and uses less power than DRAM. The price and speed differences mean static RAM is mainly used in small amounts as cache memory inside a computer's processor.

*(Text 2*)**CACHE MEMORY**

Most PCs are held back not by the speed of their main processor, but by the time it takes to move data in and out of memory. One of the most important techniques for getting around this bottleneck is the memory cache.

The idea is to use a small number of very fast memory chips as a buffer or cache between main memory and the processor. Whenever the processor needs to read data it looks in this cache area first. If it finds the data in the cache, then this counts as a ‘cache hit’ and the processor need not go through the more laborious process of reading data from the main memory. Only if the data is not in the cache does it need to access main memory, but in the process, it copies whatever it finds into the cache so that it is there ready for the next time it is needed. The whole process is controlled by a group of logic circuits called the cache controller.

One of the cache controller’s main jobs is to look after ‘cache coherency’ which means ensuring that any changes written to main memory are reflected within the cache and vice versa. There are several techniques for achieving this, the most obvious being for the processor to write directly to both the cache and main memory at the same time. This is known as a ‘write-through’ cache and is the safest solution, but also the slowest.

The main alternative is the ‘write-back’ cache which allows the processor to write changes only to the cache and not to main memory. Cache entries that have changed are flagged as ‘dirty’, telling the cache controller to write their contents back to main memory before using the space to cache new data. A write-back cache speeds up the write process, but does require a more intelligent cache controller.

Most cache controllers move a ‘line’ of data rather than just a single item each time they need to transfer data between main memory and the cache. This tends to improve the chance of a cache hit as most programs spend their time stepping through instructions stored sequentially in memory, rather than jumping about from one area to another. The amount of data transferred each time is known as the ‘line size’.

If there is a cache hit then the processor only needs to access the cache. If there is a miss then it needs to both fetch data from main memory and update the cache, which takes longer. With a standard write-through cache, data has to be written both to main memory and to the cache. With a write-back cache the processor needs only write to the cache, leaving the cache controller to write data back to main memory later on.

***1D. Match the terms with the appropriate definitions.***

|  |  |
| --- | --- |
| 1. cache hit
2. cache controller
3. cache coherency
4. write-through cache
5. write-back cache
6. line size
 | 1. *The process of writing changes only to the cache and not to main memory unless the space is used to cache new data*
2. *The amount of data transferred to the cache at any one time*
3. *The process of writing directly to both the cache and main memory at the same time*
4. *The processor is successful in finding the data in the cache*
5. *Ensuring that any changes written to main memory are reflected within the cache and vice versa*
6. *The logic circuits used to control the cache process*
 |

***2D. Mark the following as True or False:***

1. Cache memory is faster than RAM.
2. The processor looks for data in the main memory first.
3. Write-through cache is faster than write-back cache.
4. Write-back cache requires a more intelligent cache controller.
5. Most programs use instructions that are stored in sequence in memory.
6. Most cache controllers transfer one item of data at a time.
7. Hardware and software disk caches work in much the same way.

**UNIT 6**

**OPERATING SYSTEM**

1. ***Learn the basic vocabulary terms:***

|  |  |
| --- | --- |
| to accomplish – здійснювати, виконуватиallocation – розподіл (ресурсів), виділення (ресурсупроцесу)bootstrapping — розкрутка (спосіброзробкипрограмногозабезпечен-ня, за якогоспочаткурозробляєтьсяпростішийваріантпрограми,якийпотімвикористовується для реалізаціїскладніших; застосо-вується в розробцітрансляторів)tocustomize – прилаштовувати**distributions** – розподілdefaultuserinterface — стандартнийінтерфейскористувачаencryption key – ключ шифруванняto keep track – відслідковувати | **open-source** – загальнодоступнийoperating system kernel – ядроопераційноїсистеми**proprietarysoftware** – програми для внутрішньогокористуванняpeer-to-peertechnology — технологія однорангового або прямого зв’язкуpull-down menu — низхіднеменюto run an application – запуститидодатокreference – посиланняscroll bar — лінійкапрокруткиthumbwheel – колесо (пристрійвведенняскалярних величин)wearables – пристрої, якіможнаносити |

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

A computer's operating system is one of the most important “parts” of the computer. Almost every type of computer—including mobile telephones, video game systems, E-book readers, and DVRs—needs an operating system in order to operate properly. The OS helps you to communicate with the computer without knowing how to speak the computer's language. It is **not** possible for the user to use any computer or mobile device without having an operating system. When one turns on a computer, the operating system tells the computer what to do by controlling the system resources such as the processor, memory, disk space, etc. The operating system allows the user to work on the computer without having to know all the details about how the hardware works.

Some of the things that operating systems help to accomplish include managing inputs from users, sending output to the output devices, management of storage spaces and control of peripheral devices.

Within the broad family of operating systems, there are generally four types, based on the types of computers they control and the sort of applications they support. The categories are:

* Real-time operating systems (RTOS) are used to control machinery, scientific instruments, and industrial systems. In general, the user does not have much control over the functions performed by RTOS;
* Single-user, single-task operating systems allow one user to do one thing at a time. An example of a single-user, single-task operating system is the operating system used by personal digital assistants (PDAs), also known as handheld computers;
* Single-user, multi-tasking operating systems allow a single user to simultaneously run multiple applications on their computer. This is the type of operating system found on most personal desktop and laptop computers.
1. Multi-user operating systems allow multiple users to simultaneously use the resources on a single computer. Unix is an example of a multi-user operating system.

Today there are many computers of operating systems designed to meet user needs. The most important functions of an operating system are:

* Process management. Process management helps OS to create and delete processes. It also provides mechanisms for synchronization and communication among processes.
* Memory management. Memory management module performs the task of allocation and de-allocation of memory space to programs in need of this resources.
* File management. It manages all the file-related activities such as organization storage, retrieval, naming, sharing, and protection of files.
* Device Management. Device management keeps tracks of all devices. This module is also responsible for the I/O controller. It also performs the task of allocation and de-allocation of the devices.
* I/O System Management. One of the main objects of any OS is to hide the peculiarities of that hardware devices from the user.
* Secondary-Storage Management. Systems have several levels of storage which includes primary storage, secondary storage, and cache storage. Instructions and data must be stored in primary storage or cache so that a running program can reference it.
* Security. Security module protects the data and information of a computer system against malware threat and authorized access.
* Command interpretation. This module is interpreting commands given by the and acting system resources to process that commands.
* Networking. A distributed system is a group of processors which do not share memory, hardware devices, or a clock. The processors communicate with one another through the network.
* Job accounting: Keeping track of time & resources used by various job and users.
* Communication management: Coordination and assignment of compilers, interpreters, and another software resource of the various users of the computer systems.

All desktop computers have operating systems. The most common are the Windows family of operating systems developed by Microsoft, the Macintosh operating systems developed by Apple and the UNIX family of operating systems (which have been developed by a whole history of individuals, corporations and collaborators). There are hundreds of other operating systems available for special-purpose applications, including specializations for mainframes, robotics, manufacturing, real-time control systems and so on.

The operating systems we've been talking about so far were designed to run on **desktop** and **laptop** computers. **Mobile devices** such as smartphones, tablets, and wearables are different from them, so they run operating systems that are designed specifically for them. A mobile OS is responsible for identifying and defining mobile device features and functions, including keypads, application synchronization, email, thumbwheel and text messaging. The top popular mobile operating systems are Android and iOS, but others include BlackBerry OS, webOS, and watchOS.

***3. Answer the following questions:***

1. What is the basic objective of the OS?
2. What are the four types of OS categories are based on?
3. What operating system do you know?
4. What is the difference between single-user, single-task operating systems and single-user, multi-tasking operating systems?
5. What type of OS allows users to simultaneously use the resources on a single computer?
6. What are the most important requirements to the OS?
7. What is the function of the Security module?
8. What is a distributed system?
9. What are the main levels of storage?
10. Why is I/O System Management important?

***4. Say if the statements are true or false***

1. The main objects of OS is to hide the peculiarities of that hardware devices from the user.
2. Operating systems helps to control peripheral devices.
3. E-book doesn’t need an operating system.
4. UNIX operating system was developed by Apple.
5. Real-time operating system allows a single user to simultaneously run multiple applications on the computer.
6. **Mobile devices** use the same operating systems as computers.
7. File management manages the protection of files.
8. Job accounting protects the data and information of a computer system against malware threat and authorized access.
9. If any issue occurs in OS, you may lose all the contents stored in your system.
10. VxWorks Reference is a real time operating system.
11. MS-DOS and Windows 3x are examples of real-time operating systems.
12. OS acts as an intermediator between all hardware's and software's of the system.

***5. Match the terms with the appropriate definitions.***

|  |  |
| --- | --- |
| 1. hardware simulation
2. user-defined macros
3. output peripherals
4. test program template
5. antivirus package
6. educational software
7. debugging compiler
8. graphics editor
9. software tools
10. to use resources effectively
11. hardware compatible
12. input peripherals
13. toproliferate
 | 1. апаратне моделювання
2. ефективновикористовуватиресурси
3. макрооперація, визначена користувачем
4. периферійні пристрої введення
5. стандартний блок випробувальної програми
6. периферійні пристрої виведення
7. програма редагування графічної інформації
8. оцінний компілятор
9. апаратно-сумісний
10. антивірусний пакет програм
11. навчальне програмне забезпечення
12. програмні засоби
13. розповсюджувати
 |

***6. Guess what is:***

1. an open source version of Unix developed by programmers around the world;
2. concurrent execution of two or more tasks by a processor;
3. the process of copying data from the hard drive to another storage device;
4. wakes up the computer and reminds it what to do;
5. stores important, but non-essential, parts of the computer's operating system;
6. the process used to bring an operating system up to date with technology advances;
7. a large multiuser computer that can run many complex processes;
8. a unit consisting of a monitor and a keyboard connected to a multiuser CPU;
9. a list of choices or commands in a computer application;
10. instruction to the computer to perform a task or action.

***7. Fill in the blanks choosing from the variants given.***

1. An operating system … a computer’s resources, such as Ram, storage space, and peripherals.

a) allocates b) defines c) manages d) accommodates

2. To … more than one program at a time, the operating system must allocate specific areas of Ram for each program.

a) store b) install c) fix d) run

3. A graphical user-interface provides a way to point and click a mouse to … menu options and manipulate objects that appear on the screen.

a) feature b) deal with c) select d) manage

4. Handheld devices, such as PDAs and smartphones typically … single-user operating systems.

a) feature b) retrieve c) include d) establish

5. OS communicates with device driver software so that data can travel … between the computer and peripheral resources.

a) roughly b) smoothly c) simultaneously d) primary

6. Desktop operating systems are designed to accommodate a single user, but might also provide network … .

a) variety b) security c) capability d) compatibility

***8. Make three-word combinations using the words in columns and then fill in the gaps in the following sentences.***

A: multiuser B: operating C: system

 third user technologies

desktop enhancing interface

graphical operating system

performance party utilities

1. IBM’s OS/390 is one of the most popular mainframe … .

2. A computer can take advantages of … .

3. A … features menus and icons that you can manipulate with a click of a mouse.

4. A …, such as Windows, is designed for personal computers.

5. WinZip, WinAce are … that offer a variety of compression options.

***9. Fill in the gaps in the text.***

\_\_\_ (computer/application) software tells the operating system what to do. The operating system tells the \_\_\_ (device/tool) drivers, device drivers tell the \_\_\_ (software/hardware), and the hardware actually does the work. The operating system\_\_\_ (interacts/competes) with application software, device drivers, and hardware to \_\_\_ (manage/define) a computer’s \_\_\_ (resources/compatibility). The core part of an operating system is called the \_\_\_ (kernel/cycle). In addition to this core, many operating systems \_\_\_ (provide/schedule) helpful tools, called \_\_\_ (utilities/capabilities).

* **WORD-STUDY**

***1W. Learn the following speech patterns. Make your sentences with the following patterns***

A.

1. Supercomputers are very expensive such that ordinary customers cannot afford them.
2. In her eyes there was a fear **such that** she could not say a word.
3. The damage was **such that** it would cost too much money to repair.
4. The baby is **such** a cutie **that** everyone likes her.

B.

1. He didn’t show a flicker of interest **in what** I was saying to him.
2. If you cannot have the best, make the best **of what** you have.
3. He asked me for my advice **on what** he should do.
4. I was in doubt **about what** to do.

C.

1. Design variables are often bounded, **that is,** they have maximum and minimum values.
2. I’ve always enjoyed my work – **that is**, I did until this new manager arrived.
3. Uncomplicated computer interface **that is** truly easy to use.
4. **That’s** it then. There’s nothing more we can do.

 D.

1. Probably she was right **after all**.
2. I’m sorry but we’ve decided not to come **after all**.
3. She shouldn’t be working so hard – she is 70, **after all**.
4. I’m not ambitious. **After all**, money isn’t everything.

**2W. Choose the word that best completes each sentence.**

1. I don't find this story (amusing/amused). 2.I must have the mixer (fixing/fixed). 3.My room is a mess: I really must get it (tidying/tidied) up. 4. I would stay at home after such a (tiring/tired) day. 5.Uncle Frank has a gentle old horse (naming/named) Pete on his farm.

6. Can you smell something (burning/burned)? 7. He opened the letter with (shaking/shaken) fingers. 8. She had rather a (pleasing/pleased) look on her face. 9. Deeply (shocking/shocked) I left them. 10. When (answering/answered) your question yesterday, I forgot this fact.

11. He walked along the road with his collar (turning/turned) up, hands in pockets. 12. I didn't enjoy the party because I was (boring/bored) there. 13. Why not throw away the (breaking/broken) umbrella, we are not likely to repair it. 14. She didn't pay any attention to the (ringing/rung) telephone. 15. Don't you think your hair needs (cutting/cut)? 16. Can you think of the name of an animal (beginning/begun) with "B"?

***2W.Choose the right word.***

*complex — complicated — sophisticated*

1. Knowledge-based systems are widely used now in the diagnosis and control of … dynamic systems. 2. To justify his concept, the speaker resorted to highly … reasoning. 3. The sequence of tenses can be observed in … sentences only. 4. The surgical operation was … by the patient being very weak. 5. … set of measures was applied

***Translate into English choosing the right word.***

1. Студент успішновпорався з цимзавданням, хочаспочаткувоноздалосяйомунадтоскладним. 2. Складнимназиваютьфізичнийоб’єкт, щоскладається з багатьохвзаємозалежнихелементів. 3. Щобспростуватиабопідтвердитицюгіпотезу, треба про-

вести серіюскладнихекспериментів. 4. Моготовариша доставили до лікарнізіскладним переломом. 5. Хочакомп’ютер є складнимпристроєм, йогоможнаспрощенорозглядати як пристрій, щоскладається з процесора, пам’яті, мережізв’язку та пристроїввведення-виведення.

*practice — practise*

1. We need to put these ideas into … . 2. To learn English well you have to … . 3. He always … politeness. 4. To be good at it, you need to … year after year, and for your whole life. 5. It was with difficulty that he was induced to stoop from speculation to … .

***Translate into English choosing the right word.***

1. Постійна практика вдосконалюєвміннялюдини в будь-якійгалузі. 2. Спробуймозайматисяпрограмуванням разом. 3. Я надаю перевагу практичному аналізу та перевірцірізнихнауковихприпущень. 4. Моємубратовініколи не подобалосязайматисяанглійською мовою. 5. Працювати, навчаючись на третьомукурсі — цезвичайна практика середстудентівнашогоуніверситету.

***3W.Give the opposites of the following words***

Single, the simplest, general-purpose, accept, in a sequence, specified, to be loaded into, to complete, output, difficult, considerable, multiple, advanced, complexity, inability, advantage, overcome, concurrent, rapid.

***4W. Translate and learn the word combinations with the word mind. Make your own sentences with them:***

*Additional texts*

*(Text 1*) **OPERATING SYSTEMS WITH MONOLITHIC STRUCTURE**

An OS is a complex software that has a large number of functionalities and may contain millions of instructions. It is designed to consist of a set of software modules, where each module has a well-defined interface that must be used to access any of its functions or data. Such a design has the property that a module cannot see inner details of functioning of other modules. This property simplifies design, coding and testing of an OS.

Early operating systems had a monolithic structure, whereby the OS formed a single software layer between the user and the bare machine, i.e., the computer system’s hardware. The user interface was provided by a command interpreter. The command interpreter organized creation of user processes. Both the command interpreter and user processes invoked OS functionalities and services through system calls. Two kinds of problems with the monolithic structure were realized over a period of time. The sole OS layer had an interface with the bare machine. Hence architecture-dependent code was spread throughout the OS, and so there was poor portability. It also made testing and debugging difficult, leading to high costs of maintenance and enhancement. These problems led to the search for alternative ways to structure an OS.

• Layered structure: The layered structure attacks the complexity and cost of developing and maintaining an OS by structuring it into a number of layers. The multiprogramming system of the 1960s is a well known example of a layered OS.

• Kernel-based structure: The kernel-based structure confines architecture dependence to a small section of the OS code that constitutes the kernel, so that portability is increased. The Unix OS has a kernel-based structure.

• Microkernel-based OS structure: The microkernel provides a minimal set of facilities and services for implementing an OS. Its use provides portability. It also provides extensibility because changes can be made to the OS without requiring changes in the microkernel.

*(Text 2*)**DISTRIBUTED OPERATING SYSTEMS**

 A distributed computer system consists of several individual computer systems connected through a network. Each computer system could be a PC, a multiprocessor system or a cluster, which is itself a group of computers that work together in an integrated manner .Thus, many resources of a kind, e.g., many memories, CPUs and I/O devices, exist in the distributed system. A distributed operating system exploits the multiplicity of resources and the presence of a network to provide the benefits summarized in Table 1.9. However, the possibility of network faults or faults in individual computer systems complicates functioning of the operating system and necessitates use of special techniques in its design. Users also need to use special techniques to access resources over the network. Resource sharing has been the traditional motivation for distributed operating systems. A user of a PC or workstation can use resources such as printers over a local area network (LAN), and access specialized hardware or software resources of a geographically distant computer system over a wide area network (WAN). A distributed operating system provides reliability through redundancy of computer systems, resources, and communication paths—if a computer system or a resource used in an application fails, the OS can switch the application to another computer system or resource, and if a path to a resource fails, it can utilize another path to the resource. Reliability can be used to offer high availability of resources and services, which is defined as the fraction of time a resource or service is operable. High availability of a data resource, e.g., a file, can be provided by keeping copies of the file in various parts of the system. Computation speedup implies a reduction in the duration of an application, i.e., in its running time.

**UNIT 7**

**SOFTWARE**

|  |  |
| --- | --- |
| applications software – прикладне програмне забезпечення, прикладні програмиbackground– фон програми, задній планcoherence – узгодженість, стикованістьcomprise – включатиcompiler – транслятор, компілятор converttoextend– поширювати, простягатися tofacilitate – сприяти, полегшуватиfirmware– вбудовані програмиfreeware -вільно поширювані програмиinterface– 1. інтерфейс, стик  2. взаємодія  3. пристрій сполучення | option – 1. необов'язковий параметр  2. варіант  3. засібoverallactivities – загальна діяльністьrefer to– посилатисяto be referred to as – позначуваний як system software – системне програмне забезпеченняsoftware compatible– програмно-суміснийsoftware tools- 1. сервісніпрограми; допоміжніпрограми 2. інструментальніпрограмнізасобиshareware – програми загального користування |

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

**SOFTWARE**

Computer software is a set of instructions that tells a computer what to do. Computer software controls and governs the process of a computer. Without computer software, the hardware part is useless. There is no way to communicate with the computer unless you installed system software on it. Software is written and developed by computer programmers using programming languages. When we talk about computer software, it includes the two main groups of software. These are called **System Software** and **Application Software**. The other but an optional type of computer software is **Programming language**.

The system software is a collection of programs designed to operate, control, and extend the processing capabilities of the computer itself. System software is generally prepared by the computer manufacturers. These software products comprise programs written in low-level languages, which interact with the hardware at a very basic level. System software serves as the interface between the hardware and the end users. Some examples of system software are Operating System, Compilers, Interpreter, Assemblers, etc. The major functions of computer system software are:

- Managing computer processing activities;

- Managing files;

- Handling computer memory;

- Serving as an interface between computer user and hardware;

- Providing access to system resources;

- Facilitating the overall activities of each programs installed on it;

- Providing an interface for peripheral devices and network access;

- Allowing users to run application programs.

Application software, also known as an application or an app, is [computer software](https://en.wikipedia.org/wiki/Computer_software) designed to help the end user to perform one or more specific (non-computer related) tasks. Examples include [enterprise software](https://en.wikipedia.org/wiki/Enterprise_software), [accounting software](https://en.wikipedia.org/wiki/Accounting_software), [office suites](https://en.wikipedia.org/wiki/Office_suite), [graphics software](https://en.wikipedia.org/wiki/Graphics_software) and [media players](https://en.wikipedia.org/wiki/Media_player_%28application_software%29). Many application programs deal principally with [documents](https://en.wikipedia.org/wiki/Document_file_format).

Developers have many different options for getting their applications to end users. In the past nearly all applications were installed directly on the users' PCs and/or servers. Today, many applications are delivered as *Web applications*. Common examples of Web applications include Web-based email, social media platforms, wikis and online auctions.

The distinctions between Web applications and *websites* can be a bit fuzzy. However, in general, websites have primarily static content with few interactive elements, while Web applications have primarily dynamic content and are designed for user interaction.

A third type, *software-as-a-service (SaaS)* applications, is closely related to Web applications. As with Web applications, users generally access SaaS applications via a Web browser. However, some SaaS applications can also be accessed via a native mobile app on a device like a smartphone or a tablet. Also, user data for a SaaS application is stored in a cloud computing environment (which may or may not be the case for Web applications), and many SaaS applications charge a subscription fee, which is less common for Web applications. Well-known examples of SaaS applications include Salesforce.com, Microsoft Office 365 and Adobe Creative Cloud.

Firmware is a very specific type of software installed in the hardware of a device that makes the hardware function according to the manufacturer’s intended purposes. It provides instructions that allow the device to operate and communicate with other devices. Firmware is installed in the read-only memory (ROM) or programmable read-only memory (PROM) of a device. Although firmware can technically be erased and rewritten, it is designed to be permanent.

There are some distinctions that should be made between the firmware and the software in programs that we use on devices every day. For example, software is virtual so it can be copied, changed, and destroyed. It is often stored in memory that is easily accessible and even replaceable by the user. But in the case of firmware, the memory that it stores is often embedded in the device itself and is not replaceable by the user. This is done deliberately to prevent any tampering or removing as it is critical for the device to run and can cause serious consequences if removed.

Also, software is often upgraded, and so the information stored in it is often modified/altered with each execution of the application. In contrast, the firmware does not really change much unless you modify the settings very often. There is also very little or no requirement to change the firmware of a device.

1. ***Read and translate the text:***
2. What is the computer software?
3. What are the main types of computer software?
4. What are the major functions of computer system software?
5. What are the apps?
6. What is the difference between Web applications and websites?
7. How do *software-as-a-service (SaaS)* applications work?
8. What is firmware?
9. What are the main differences between firmware and software?
10. What Microsoft application would you use to create a budget?
11. What Microsoft application would you use to write a term paper?

***4. Say if the statements are true or false:***

1. Software is an ordered sequence of instructions for changing the state of the computer hardware in a particular sequence.
2. The purpose of application software is to insulate the programmer from the details of the particular computer complex being used.
3. System software helps to perform the non-computer related tasks
4. Typical examples of system software are word processors, spreadsheets, and media players.
5. Application software helps to run the computer hardware and computer system.
6. Applications are usually [bundled](https://en.wikipedia.org/wiki/Product_bundling) with the computer and its system software.
7. Spreadsheet is a data file made up of rows and columns that are used to sort data and allow a user to manipulate and arrange data easily, commonly numerical data.
8. Software products comprise programs written in high-level languages
9. Application software’s either need to be installed or can run online.
10. Firmware can be easily changed or modified.

***5. Match the terms with the appropriate definitions.***

|  |  |
| --- | --- |
| 1. Email Programs
2. Internet Browsers
3. Presentation Software
4. Communication Software
5. Database Software
6. Desktop Publishing Software
7. Spreadsheet Software
8. Word processing software
 | 1. A tool used to compute number intensive problems like forecasting, budgeting etc.
2. This tool is used to create letters, word sheets, type papers etc.
3. This tool is used to create illustrative worksheets, banners, newsletters, signs, gift cards etc.
4. Used to store data like text information, memberships, address etc. which helps users to sort information accordingly.
5. Allows to connected computers to communicate each other using audio, video or chat-based medium.
6. Used to create multimedia stacks of cards/screens
7. This tool allows one to surf the web, read their emails and also create web pages.
8. This software is mainly used to send and receive emails.
 |

***6. Study the difference between System Software and Application Software***

|  |  |  |
| --- | --- | --- |
|  | **System Software** | **Application Software** |
| 1. | System software is used for operating computer hardware. | Application software is used by user to perform specific task. |
| 2. | System softwares are installed on the computer when operating system is installed. | Application softwares are installed according to user’s requirements. |
| 3. | In general, the user does not interact with system software because it works in the background. | In general, the user interacts with application sofwares. |
| 4. | System software can run independently. It provides platform for running application softwares. | Application software can’t run independently. They can’t run without the presence of system software. |
| 5. | Some examples of system softwares are compiler, assembler, debugger, driver, etc. | Some examples of application softwares are word processor, web browser, media player, etc. |

***7. Fill in the blanks choosing from the variants given.***

1. The instructions that tell a computer how to … a task are referred to as a computer program.

a) require b) create c) carry out d) define

2. A programming language … tools for creating a lengthy list of instructions called source code.

a) prefer b) refer to c) avoid d) provide

3. As a program is running an interpreter converts one instruction… into machine language.

a) at a time b) at the same time c) all the time

4. eVidpro.exe is a compiled program, so its instructions are immediately … by the processor.

a) provided b) modified c) executed d) adapted

5. Software includes menus, buttons, and other control objects that are … by a programmer, who designates their properties.

a) converted b) defined c) reduced d) purchased

6. The software that provides the computer with … for each use is called application software.

a) approaches b) efficiency c) utilities d) instructions

7. Various kinds of document product software provide tools for creating and … printed and web-based materials.

a) formatting b) sorting c) assembling d) transmitting

8. Spreadsheet software provides a sort of “blank canvas” on which you can create numeric … by simply “painting” values, labels, and formulas.

a) columns b) sequences c) models d) features

9. Database software stores data as a series of … and allows you to establish relationships between different types of records.

a) templates b) items c) entities d) records

10. CD ripper software … files from an audio CD to your computer’s hard disk.

a) edits b) transfers c) formats d) sorts

11. The reference software category spans a wide … of applications.

a) entity b) sequence c) range d) circuit

***8. Transform the following sentences without any change in meaning. Use the prompts as they are given (words in brackets, parts of sentences).***

1. Most document production software includes a spelling checker.

 A spelling checker is mostly …

2. Word processing offers several features that can improve the quality of writing (to enhance).

3. You may not be a composer or a musician to have a use for music software.

 Neither … nor …

4. Many types of CAD software is available (get access).

5. Instead of typing data into a database you can also use data from a commercial database (import).

 … than … you can …

6. If you are interested in working with graphics, you end up using more than one graphics software product (combine).

 One who …

***9. Fill in the gaps with the words from the box.***

|  |
| --- |
| To divide to be used to be written to be coded to encompass to provide  |

1. It \_\_\_\_to describe a collection of computer programs. 2. These applications \_\_\_\_.industrial automation, business software, educational software, medical software and etc. 3. Computer systems \_\_\_\_software systems into three major classes. 4. Programming software usually \_\_\_\_tools to assist a programmer in writing computer programs. 5. Programs, video games \_\_\_\_by programming languages. 6. Software usually \_\_\_\_in high-level programming languages. VI. Answer the following questions. 1. What is computer software? 2. What does software encompass? 3. What does hardware include? 4. What are high level languages oriented to? 5. What major classes are software systems divided into?

***10. Make two-word expressions by combining words from two lists: A and B. Then fill in the gaps in the following sentences.***

 A: executable B: language

 application code

 machine file

 source extensions

 file software

 high-level instructions

1. When using a Windows PC, you can start an … by clicking its icon, selecting it from a Start menu, or entering its name in the Run dialog box.

2. Computer software can be divided into two major categories: … software and system software.

3. The data files supplied with a software package sport … such as .txt, .bmp, .hlp.

4. A programming language provides tools for creating a lengthy list of instructions called … .

5. A simple instruction to add two numbers becomes a long series of 0s and 1s in a… .

6. A compiler converts … into a file containing machine language instructions.

***11. Fill in the gaps in the text.***

Software consists of computer \_\_\_ (programs/utilities) and data files that work together to provide a computer with the \_\_\_ (instructions/approaches) and \_\_\_ (data/tools) necessary for carrying out a specific type of task, such as document production, video editing, graphic design, or Web browsing.

To create a software \_\_\_ (efficiency/environment), a programmer must define the \_\_\_ (approaches/properties) for each element in the environment, such as where an object appears, its shape, its color, and its behavior. Most programmers today prefer to use \_\_\_ (high-level/machine) languages. A computer’s microprocessor understands only \_\_\_ (machine/high-level) language, however, so a program that is written in a high-level language must be \_\_\_ (avoided/compiled) or interpreted before it can be \_\_\_ (processed/modified).

***12. Give the Ukrainian equivalents.***

To be used in a broader context; to distinguish from; to encompass the physical interconnections; to store and execute (or run); software preceding state; as much as possible; to insulate from; hardware features; accessory devices; to assist a programmer; groups of binary values; ordered sequence of instructions; high-level programming languages; closer to natural language; system software; programming software; application software; device drivers; diagnostic tools.

***13. Give the English equivalent.***

Програмнезабезпеченнядляпрограмування; прикладнапрограма; допоміжніпристрої; робитинезрозумілим; системнепрограмнезабезпечення; впорядкованапослідовністьінструкцій; довільний; відрізнятивід; характеристика; програманалагодження; попередній; компілятор; текстовийредактор; виконуватидеякізавдання; міститивсобі.

***14. Match the following English expressions and their Ukrainian equivalents:***

|  |  |
| --- | --- |
| 1. to distinguish
2. to encompass
3. to signify
4. to insulate
5. to precede
6. to blur
7. to accomplish
8. arbitrary
9. accessory
10. feature
11. debugger
12. cache coherence
 | 1. відрізняти, розрізняти
2. охоплювати, включати
3. висловлювати, показувати
4. нала́годження програ́ми
5. ознака, риса, властивість
6. відокремлювати
7. передувати
8. робитинезрозумілим
9. здійснювати, виконувати
10. узгодженість кеш-пам’яті
11. довільний
12. додатковий, допоміжний
 |

***15. Match the beginnings of the sentences in the first column with the endings in the second.***

|  |  |
| --- | --- |
| 1. When you install software its files | for different operating systems.  |
| 2. Installation procedures differ  | might end up in different folders.  |
| 3. Downloadable software can be provided  | that guides you through the installation process.  |
| 4. Public domain software  | involves a fee. |
| 5. Windows software typically contains a setup program  | in several different formats . |
| 6. Updating to a new version usually  | is not protected by copyright.  |

***16***. ***Insert the words from the box***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| locatedcapabilities | coherenceresources | allowslead | manageabilityadapt | providesadjust |

***Cloud Computing (Applications)***

Cloud computing is a type of Internet-based computing that ..1.. shared computer processing resources and data to computers and other devices on demand. It is a model for enabling ubiquitous, on-demand access to a shared pool of configurable computing ..2.. (e.g., computer networks, servers, storage, applications and services), which can be rapidly provisioned and released with minimal management effort. Cloud computing and storage solutions provide users and enterprises with various ..3.. to store and process their data in third-party data centers that may be ..4.. far from the user – ranging in distance from across a city to across the world. Cloud computing relies on sharing of resources to achieve ..5.. and economy of scale, similar to a utility (like the electricity grid) over an electricity network.

Advocates claim that cloud computing ..6.. companies to avoid up-front infrastructure costs (e.g., purchasing servers). As well, it enables organizations to focus on their core businesses instead of spending time and money on computer infrastructure. Proponents also claim that cloud computing allows enterprises to get their applications up and running faster, with improved ..7.. and less maintenance and enables Information technology (IT) teams to more rapidly ...8 .. resources to meet fluctuating and unpredictable business demand. Cloud providers typically use a "pay as you go" model. This will ..10.. to unexpectedly high charges if administrators do not ..9.. to the cloud pricing model.

Cloud apps store their data in the cloud, but it can be cached locally, allowing full use offline, unlike web apps that must be used online. Web apps always use a browser, while cloud apps may allow the use of a browser but allow alternative access methods.

***17. Restore the instructions for installing software from distribution media by matching the beginnings with the endings and put them into the correct order.***

|  |  |
| --- | --- |
| Start | the license agreement if one is presented on the screen. By agreeing to the terms of the license, you can proceed with the installation. |
| Insert | the first distribution CD or DVD. The setup program should start automatically. |
| Select | the prompts provided by the setup program to specify a folder to hold the new software program. |
| Follow | the installation option that best meets your needs. |
| Read | the program you just installed to make sure it works. |
| Insert | multiple distribution CDs in the specified drive when the setup program prompts you. |

* **WORD-STUDY**

***1W. Put the letters in the following words into correct order.***

tchopgiryroeisttcrideexecsusnecropmtrneeqmueirrdeivsocerceneefr

***2W. Learn the following speech patterns.***

**A.** He doesn’t do it the **way** I do.

It’s disgraceful the **way** he behaves.

The work must be finished one **way** or another.

It’s not his **way** to be so rude.

**B.** Mr. Hopkins **substituted for** a teacher who was in hospital.

A construction which may **substitute for** a word is a phrase.

In this cake mixture, you can **substitute** oil **for** butter.

The actress’s big break came when she **substituted for** the ailing star.

**C.** A cone is **much like** a pyramid but has a circle for a base.

A CD-RW disk is **much like** a CD-R but it can be written to multiple times.

A modern PC is **nothing like** a bulky computer used in the 1960s-1970s.

It’s **nothing like** what it used to be.

***3W.Match the antonyms.***

|  |  |
| --- | --- |
| Verbs 1. increase a. keep2. push b. sell3. buy c. go up4. drop d. decrease | Nouns 1. wholesale a. vendor2. shrinkage b. retail3. customer c. likeness4. subscriber d. growth5. distinction e. publisher |

***2W.Choose the right word.***

*beside — besides*

1. The building was situated … the Dnieper River. 2. … water we carried some fruit. 3. Let me sit down … you. 4. … Latin our language seems to be quite easier. 5. She had no other family … her parents.

***Translate into English choosing the right word.***

1. Я завждивідчувавйогодружнє плече поряд. 2. Порівняно з іншимидисциплінами дискретна математика є складною наукою. 3. Крімсвоєїроботи, я здатенробитище й твою. 4. Всі, за виняткоммого брата, вірили в йогогеніальність. 5. Я не маю намірузастерігати тебе; крім того, я не впевнений, щотобіщосьзагрожує.

*come over — overcome*

1. He tried to … as an IT expert but his ignorance of the matter was revealed after a few questions. 2. Using technology can help many people … any disabilities they might have. 3. Don’t stand up too quickly or you may … dizzy. 4. Many experts that used to think otherwise are … to our side. 5. They managed to … this problem.

***Translate into English choosing the right word.***

1. У мене паморочиться в головіщоразу, коли я дивлюсь вниз. 2. Разом ми здолаємовсіскладнощі на нашому шляху. 3. Чому б тобі не зайти до мене якосьувечері? 4. Ми переможемо! 5. Їйвдалосяпоборотиспокусузателефонуватимені.

***Additional texts***

*(Text1)* **Software Copyrights and licenses**

**Copyright** laws have fairly severe restrictions on copying, distributing, and reselling software; however, a license agreement might offer additional rights to consumers. The licenses for commercial software, shareware, freeware, open source, and public domain software specify different levels of permission for software use, copying, and distribution.

**Commercial software** is typically sold in computer stores or at Web sites. Although you “buy” this software, you actually purchase only the right to use it under the terms of the software license.

**Shareware** is copyrighted software marketed under a “try before buy” policy. It typically includes a license that permits you to use software for a trial period. To use it beyond the trial period you must pay a registration fee. A shareware license usually allows you to make copies of the software and distribute them to others. If they choose to use the software, they must pay a registration fee as well.

**Freeware** is copyrighted software that is available for free. Because the software is protected by copyright, you cannot do anything with it that is not allowed by copyright law or by the author. Typically, the license for freeware permits you to use the software, copy it, and give it away, but does not permit you to alter it or sell it. Many utility programs, device drivers, and some games are available as freeware.

**Open source** software makes the uncompiled program instructions – the source code – available to programmers who want to modify and improve the software.

**Public domain** software is not protected by copyright because the copyright has **expired,** or the author has placed the program in the public domain, making it available without **restriction**. It may be freely copied, distributed, even resold. The primary restriction on public domain software is that you are not allowed to apply for a copyright on it.

*(Text2)* **Critical thinking.** Read the article and express your opinion on the problem.

**HUMAN FACTORS**

Today’s programming languages provide programmers with sophisticated tools for coding and testing software. Why then, are computers and computer software so often characterized as being difficult to use?

Programmer and user interface designer Alan Cooper offers an explanation and solution in his book “The Inmates Are Running the Asylum”. According to Cooper, programmers don’t intentionally create bad technology products. “Programmers aren’t evil. They work hard to make their software easy to use. Unfortunately, their frame of reference is themselves, so they only make it easy to use for other software engineers, not for normal human beings”. Cooper suggests that it is possible to create intuitive, easy-to-use technology products by devoting more time to developing detailed product specifications with the assistance of an “interactive designer” who is familiar with the psychology and habits of a typical computer user.

**The Computer User’s Bill of Rights**

The user is always right. If there is a problem with the use of the system, the

system is the problem, not the user.

The user has the right to easily install software and hardware systems.

The user has the right to a system that performs exactly as promised.

The user has the right to easy-to-use instructions for understanding and utilizing

a system to achieve desired goals.

The user has the right to be in control of the system and to be able to get the

system to respond to a request for attention.

The user has the right to a system that provides clear, understandable, and

accurate information regarding the task it is performing and the progress toward completion.

The user has the right to be clearly informed about all system requirements for

successfully using software or hardware.

The user has the right to know the limits of the system’s capabilities.

The user has the right to communicate with the technology provider and receive

a thoughtful and helpful response when raising concerns.

The user should be the Master of Software and hardware technology, not vice-

versa. Products should be natural and intuitive to use.

Karat agrees with Cooper’s comments about programmers being unable to understand the people who use their software. She says, “The profile of the people who use systems has changed, while the system, and the culture in which they have developed, have not adjusted … The engineers and computer scientists who design hardware and software know little about the needs and frustrations of consumers.”

Some efforts to simplify operating system software have created another band of disgruntled users who complain that important features are now “hidden” because of feedback from novice testers who considered such features too advanced or confusing. Some controls, such as those for setting up networks, are not easy to understand, but could be crucial for a successful installation. Hiding those controls because they might confuse beginners has only caused advanced users to become frustrated.

Who is right? Can technology be simplified, yet remain powerful enough to accomplish complex tasks? A branch of ergonomics called Human Factors, or Human-Computer Interaction (HCI), focuses on factors that make computers easy or difficult to use.

**What do you think?**

1. Can you think of a specific instance when you have become frustrated with a software user interface?

2. Is it possible to make computer software significantly easier to use?

3. Would you agree that programmers do not understand the viewpoint of a typical computer user and consequently produce bad software?

**UNIT 8**

**COMPUTER NETWORKS**

1. ***Learn the basic vocabulary terms:***

|  |  |
| --- | --- |
| to abort –припинятиbridge –міст (пристрій, щоз’єднуєлокальнімережі)to broadcastcollection –сукупністьcohesive architecture – зв’язанаархітектураEthernet – стандарт організаціїлокальних мереж)gateway– шлюз (мережнийпристрійабокомп’ютер, щоздійснюєзв’язокміжкомп’ютерними мережами, яківикористовуютьрізнікомунікаційніпротоколи) hub – хаб, концентратор (апаратнийвузол, до якогопідключаютьсявузлимережітопології «зірка»)toinvolve – містити, мати в собіleasedline – виділеналініяnode– вузол (комп’ютерноїмережі) opticalfibre – оптичне волокно toрenetrate – проникатиparticular – конкретний | router – маршрутизатор sharedresources– спільніресурсиseamless– плавний, суцільнийswitch 1. перемикач (масив адрес точок переходу) token – позначка, маркерobjecttoken – маркер данихmultiple–tokennetwork мережа с множинним маркерним доступомсимвольне позначення об’єкта TokenRing – маркерне кільце (стандарт організації локальної мережі) toolbar – панель інструментів tapintoanetwork – підключатися до мережі transferpoint – точка переходу (передачі трафіка) wiring technology – технологіяз’єднання |

1. ***Learn the following abbreviations:***

*ATM*

asynchronous transfer mode – асинхронний спосіб передачі даних

automated teller machine — банківський автомат

ISP(Internet service provider) – інтернет провайдер

FTP(File Transfer Protocol) — протоколпередачіфайлів

LAN (Local Area Network ) – локальна мережа

MAN (Metropolitan Area Network) – міська мережа

NIC (network interface card) — мережевакарта

PAN (Personal Area Network)персональнамережа

VPN (Virtual private network) — віртуальнаприватнамережа

VPS (Virtual private server) —віртуальнийвиділенийсервер

Qos (Quality of service) —набірметодівдляуправлінняресурсамипакетних мереж

WAN (wide-area network) — широкомасштабнамережа

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

**BASICS OF COMPUTER NETWORKING**

Computer networking has existed for many years, and as time has passed the technologies have become faster and less expensive. Today computer networks are everywhere. You will find them in homes, offices, factories, hospitals, leisure centers etc. But how are they created? What technologies do they use?

Networks are made up of various devices – computers, switches, routers connected by cables or wireless signals.

The network you have at home uses the same networking technologies, protocols and services that are used in large corporate networks and on the Internet. The only real difference between a home network and a large corporate network is the size. A home network will have between 1 and 20 devices and a corporate network will have many thousands.

A network can be categorized in several different ways. One method defines the type of a network according to the geographic area it spans since it can be as small as a distance between your mobile phone and its Bluetooth headphone and as large as the internet itself, covering the whole geographical world.

* A Personal Area Network (PAN) is smallest network which is very personal to a user. This may include Bluetooth enabled devices or infra-red enabled devices. PAN has connectivity range up to 10 meters. It may include wireless computer keyboard and mouse, Bluetooth enabled headphones, wireless printers and TV remotes;
* A computer network spanned inside a building and operated under single administrative system is generally termed as Local Area Network (LAN). Usually LAN covers an organizations’ offices, schools, colleges or universities. Number of systems connected in LAN may vary from two to as much as 16 million. LAN provides a useful way of sharing the resources between end users. Such resources as printers, file servers, scanners, and internet are easily sharable among computers. LAN can be wired, wireless, or in both forms at once.
* The Metropolitan Area Network (MAN) generally expands throughout a city such as cable TV network. It can be in the form of Ethernet, Token-ring, ATM, or Fiber Distributed Data Interface (FDDI). Metro Ethernet is a service which is provided by ISPs. This service enables its users to expand their Local Area Networks. For example, MAN can help an organization to connect all its offices in a city.
* the Wide Area Network (WAN) covers a wide area which may span across provinces and even a whole country. Generally, telecommunication networks are Wide Area Network. These networks provide connectivity to MANs and LANs. Since they are equipped with very high-speed backbone, WANs use very expensive network equipment. WAN may use advanced technologies such as Asynchronous Transfer Mode (ATM), Frame Relay, and Synchronous Optical Network (SONET).
* A network of networks is called an internetwork, or simply the internet. It is the largest network. The internet hugely connects all WANs and it can have connection to LANs and Home networks. Internet enables its users to share and access enormous amount of information worldwide. It uses WWW, FTP, email services, audio and video streaming etc. At huge level, internet works on Client-Server model.

Traditionally, computers are connected to each other using cables—creating a network. The cable used most often is Ethernet, which consists of four pairs of wires inside of a plastic jacket. It is physically similar to phone cables but can transport much more data.

But cables and computers alone do not make a good network, so one early solution was to use a network **hub**. Hub is commonly used to connect segments of a LAN (Local Area Network). It contains multiple ports. When a packet arrives at one port, it is copied to the other ports so that all segments of the LAN can see all packets. Hub acts as a common connection point for devices in a network. A network using a hub can slow down if many computers are sending messages, since they may try and send messages at the same time and confuse the hub. To help with this problem networks began to use another device called a **switch**.

A network switch also connects computers to each other like a hub. The difference is in the way it handles packets of data. Instead of repeating all messages that come in, a switch only sends the message to the intended destination. This eliminates the unnecessary repetition of the hub. For this reason alone, switches are usually preferred over a hub.

A network router is quite different from a switch or hub since its primary function is to route data packets to other networks instead of only the local computers. A router is quite common to find in homes and businesses since it allows your network to communicate with other networks including the Internet. Essentially, a router bridges the gap between other networks and gives your network access to more features, e.g., a firewall, Qos, traffic monitoring, VPN, and more.

1. ***Answer the following questions:***
2. What is a computer network? What is the main idea of networks?
3. What is a typical network made up?
4. What methods to define the type of a network are used?
5. What is a file server? What does it enable?
6. How does MAN differ from LAN?
7. What are the disadvantages of WAN?
8. How can computers be connected to each other?
9. What do we call a set of rules that governs data communication?
10. What is hub used for?
11. How does a hub differ from a switch?
12. What is the function of the router?
13. ***Say if the statements are true or false***
14. LAN covers a wide area which may span across provinces and even a whole country.
15. A server acts as a controller, connecting computers and printers to a network in a building or a campus.
16. Hub is a network device that repeats the traffic it receives to all connected devices.
17. A switch is a computer that holds content and services such as a website, a media file, or a chat application.
18. Computers in the network can be connected to each other only with the help of cables.
19. A network of networks is called an internetwork, or simply the internet.
20. The Internet is a collection of networks and gateways linking millions of computer users on every continent.
21. WANs are used to connect LANs together.
22. All computers on a peer-to-peer network can be considered equals.
23. Firewall is an address on a single machine that can be tied to a specific piece of software.

***6. Complete the text with verbs from the box:***

**Network configurations**

|  |
| --- |
| Performs freeing connect communicate unable linked Proceeds indicates picks up broadcast aborts determine |

***1. Star***

In the star configuration, the central computer ..1.. all processing and control functions. All access devices are ..2.. directly to the central computer. The star configuration has two major limitations. First of all, the remote devices are ..3.. to communicate directly. Instead, they must ..4.. via the central computer only. Secondly, the star network is very susceptible to failure, either in the central computer or the transmission links.

***2. Switched***

The central switch, which could be а telephone exchange, is used to ..5.. different devices on the network directly. Once the link is established, the two devices communicate as though they were directly linked without interference from any other device. At the end of the session, the connection is closed, ..6.. capacity for other users and allowing access to other devices. Multiple switches can be used to create alternative transmission routes.

***3. Ring***

Each device is attached to а network shaped as а continuous loop. Data ..7.. in only one direction and at а constant speed round the loop. Devices may send information only when they are in control of the 'token'. The token is а package of data which ..8.. which device has control. The receiving device ..9.. the token, then clears it for another's use once it has received the message. Only one device may send data at any given moment, and each device must be working for the network to function.

***4. Bus/Ethernet***

А bus network consists of one piece of cable terminated at eachend to which alldevices are connected. In а bus-based network, each device is able to ..10.. amessage when it has detected silence for a fixed period of time. All devices receive the broadcast and ..11.. from the content of the message whether it was intended for them. The only problem occurs when two devices try to send at the same time. When а sending device detects another's transmission, it ..12.. its own.

 ***7.The columns below describe characteristics of the bus and ring configurations. Which column refers to which configuration? How did you decide?***

**a b**

varied time response calculable time response

easy expansion difficult reconfiguration

fault-tolerant fault-intolerant

simple more complex

***8. Which of the network configurations does this flowchart refer to?***

***9. Match the terms with the appropriate definitions.***

|  |  |
| --- | --- |
| 1. **protocol**
2. **port**
3. **node**
4. **ethernal**
5. **hub**
6. **switch**
7. **router**
8. **firewall**
 | 1. standard used to define a method of exchanging data over a computer network
2. any system or device connected to a network
3. location where information is sent
4. a system for connecting a number of computer systems to form a local area network, with protocols to control the passing of information and to avoid simultaneous transmission by two or more systems
5. a device that acts as a filter for data entering or leaving a network or computer
6. a device used to connect segments of a LAN
7. a device that sends traffic it receives to a specific connected device, such as a PC or a laptop
8. a device designed to receive, analyze and move incoming packets to another network
 |

***10. Translate into English***

1. Комп’ютернамережа — цегрупакомп’ютерівтаіншихпристроїв, з’єднанихразомдляспільноговикористанняінформації. 2. Дедалібільшепересічнихгромадян, некажучивжепроурядовіорганізації, навчальнізаклади, конструкторськібюро, комерційніорганізації, підключаютьсядоглобальноїмережіщоднядляспільноговикористанняресурсів. 3. Спільними ресурсами можуть бути інформація у файлах, принтери та іншіпериферійніпристрої. 4. Новий провайдер послугІнтернетзабезпечуєнадзвичайношвидку передачу даних. 5. У комп’ютерніймережіокремимистанціями, щоназиваються «вузлами», можуть бути комп’ютери, терміналиабопристроїзв’язкурізнихтипів. 6. Мобільнітехнологіїнастількиглибоко проникли в нашу свідомість, що ми не уявляємо без них щоденногожиття. 7. Локальнімережісхожоїархітектуриз’єднуються точками переходу, якіназиваються «мостами». 8. Найкращим прикладом глобальноїмережі є Інтернет — сукупність мереж і шлюзів, якіз’єднуютьмільйоникористувачів на всіх континентах. 9. Кількість і складністьмережнихпротоколівпродовжуєзростати у зв’язку з можливістювикористаннярізнихтипівобладнання для забезпеченнязв’язкулокальних мереж зі схожими та з різнимиархітектурами з глобальною мережею.

***11. Complete the sentences translating their Ukrainian parts into English.***

1. Now it is hard to find a person who uses computers but (ніколинечулапрокомп’ютернімережі). 2. (Спільнекористуванняресурсами) is the main idea of networks. 3. Imagine there are several computers in an office (івсівонипрацюютьякізграфікою, такіздокументами). 4. (Вимарнуєтесвійчасічаслюдини, якапрацює) on the computer with a printer. 5. (Тепервилишенатискаєтекнопкудруку) on the toolbar of your application. 6. A computer network consists of two or more computers that are (взаємопов’язанізтим, абирозподілятиресурси, здійснюватиобмінфайламиабоуможливитиелектроннийзв’язок). 7. A local-area network is a computer network that (охоплюєлокальнутериторію). 8. (Крімфізичногоз’єднаннякомп’ютерівіпристроївзв’язкумережнасистемамаєфункціювстановленнязв’язаноїархітектури) that allows almost seamless data transmission while using various equipment types. 9. A LAN typically includes two or more PCs, printers, CD-ROMs and high-capacity storage devices, called file servers, (якідаютьможливістькожномукомп’ютерувмережіматидоступдоспільногонаборуфайлів). 10. LAN users may also have access to other LANs (абопідключатисядоглобальнихмереж). 11. LANs with different architectures use “gateways” (дляперетворенняданих, коливонипроходятьміжсистемами). 12. Computer networks may link the computers (задопомогоюкабелів, оптичнихволоконабосупутниківтамодемів).

***12. Give derivatives of the following words and explain their meanings.***

Change, local, wide, convert, browse, engine, connect, allow, establish, cover, dictate, accept, access, function, vary, collect, differ, type, store.

***13. Choose the right word:***

1. Computer networks link computers by communication lines and software protocols, allowing data … rapidly and reliably.
	1. to be exchanged b. to be exchanging c. to exchange
2. Traditionally, networks … between WANs and LANs.
	* + - 1. have been splitted b. have been split c. has split
3. Networks … to provide terminal access to another computer.

was used b. were used c. used

1. Today, networks carry е-mail, provide access to public databases and bulletin boards, and … to be used for distributed systems.
	1. are beginning b. were beginning c. are begun
2. Distributed computer systems are built … networked computers.
	* + - 1. used b. having used c. using
3. The high-quality bit-mapped graphics screen of а personal computer or workstation … а good user interface.

provides b. is provided c. has been providing

1. The PC passes the query, written in а special language to the mainframe, which then parses the query, returning to the user only the data … .
	1. requesting b. requests c. requested
2. Synchronous orbit satellites lowered the price of long-distance telephone calls, … computer data and television signals to be distributed morecheaply around the world.
	* + - 1. enabling b. enabled c. is enabling
3. Fibre-optic cable … on а large scale, enabling vast amounts of data to be transmitted at а very high speed using light signals.

has been installed b. have been installed c. has installed

1. The impact of fibre optics … the price of network access considerably.
2. will be reduced b. will reduce c. are reducing
* **WORD-STUDY**

**1W.*Translate the sentences using as many equivalents of the italicized words as you can.***

*Model: Існуєдваосновнихтипитипологіїмереж: фізичнаталогічна. — There are two main (major, principal, basic) types of network topology: physical or logical*

1. **Крім**створення шуму, цімоторнічовнидужезабруднюють озеро. 2. Агрегат — цевузолмашини, якийскладається з окремих деталей, котрі**виконуютьпевну**функцію. 3. Адаптер — цепристрій для **з’єднання**різногообладнання. 4. Архівування — цепроцесвпорядкованогонакопиченнядокументів для **тривалого**зберігання, зазвичайізущільненнямінформації. 5. В автоматизованих системах журнал — це**набір**файлів для реєстраціїподійзаданого типу (аботипів) у часовійпослідовності. 6. Електромеханіка — цепідрозділелектротехніки, що**охоплює**виробництво та експлуатаціюелектричнихдвигунів, машин і механізмів. 7. Кількістьпотенційнихклієнтів, **розмір** та характеристика регіону**визначають** структуру дистриб’юторськоїмережіданоїкомпанії. 12. Комп’ютеризований конференц-зв’язок — цезв’язок**за допомогою**обчислювальних машин, що**даєможливість**вводити і прийматиповідомлення через зв’язаніміж собою термінали.

***2W.Choose the right word.***

*complement — compliment*

1. The colours blue and green … each other perfectly. 2. It was the nicest … anyone had ever paid me. 3. Men seek for money as the … of all their desires. 4. Their sauces are the perfect … to any meal.

***Translate into English choosing the right word.***

1. Ціілюстраціїчудоводоповнюютьзміст книги. 2. Цекращийізкомпліментів, якіменідоводилосячути. 3. Щобдосягтиповнотивідчуттів, не обов’язковоризикуватижиттям. 4. Скоро Новийрік, то ж моїнайкращіпобажання вам та вашійродині!

*decent — descent*

1. Everyone should be entitled to a … standard of living. 2. The plane began its final … prior to landing. 3. She found out that she was of Welsh … . 4. She had a … upbringing. 5. You can get quite a … meal without spending too much money.
2. ***Translate into English choosing the right word.***

Відвідуючиуніверситет, треба завждиматипристойнийвигляд. 2. Вирішуючицепитання, треба виявлятипорядність. 3. Зниженнялітака є однією з основних фаз польоту, відякоїзалежитьбезпекапасажирів. 4. Ми з’ясували, щовін є прямим нащадком одного з видатнихпоетівстародавніхчасів.

**2W. Choose the word that best completes each sentence.**

1. I don't find this story (amusing/amused). 2.I must have the mixer (fixing/fixed). 3.My room is a mess: I really must get it (tidying/tidied) up. 4. I would stay at home after such a (tiring/tired) day. 5.Uncle Frank has a gentle old horse (naming/named) Pete on his farm.

6. Can you smell something (burning/burned)? 7. He opened the letter with (shaking/shaken) fingers. 8. She had rather a (pleasing/pleased) look on her face. 9. Deeply (shocking/shocked) I left them. 10. When (answering/answered) your question yesterday, I forgot this fact.

11. He walked along the road with his collar (turning/turned) up, hands in pockets. 12. I didn't enjoy the party because I was (boring/bored) there. 13. Why not throw away the (breaking/broken) umbrella, we are not likely to repair it. 14. She didn't pay any attention to the (ringing/rung) telephone. 15. Don't you think your hair needs (cutting/cut)? 16. Can you think of the name of an animal (beginning/begun) with "B"?

***2W.Choose the right word.***

*complex — complicated — sophisticated*

1. Knowledge-based systems are widely used now in the diagnosis and control of … dynamic systems. 2. To justify his concept, the speaker resorted to highly … reasoning. 3. The sequence of tenses can be observed in … sentences only. 4. The surgical operation was … by the patient being very weak. 5. … set of measures was applied

***Translate into English choosing the right word.***

1. Студент успішновпорався з цимзавданням, хочаспочаткувоноздалосяйомунадтоскладним. 2. Складнимназиваютьфізичнийоб’єкт, щоскладається з багатьохвзаємозалежнихелементів. 3. Щобспростуватиабопідтвердитицюгіпотезу, треба про-

вести серіюскладнихекспериментів. 4. Моготовариша доставили до лікарнізіскладним переломом. 5. Хочакомп’ютер є складнимпристроєм, йогоможнаспрощенорозглядати як пристрій, щоскладається з процесора, пам’яті, мережізв’язку та пристроїввведення-виведення.

*practice — practise*

1. We need to put these ideas into … . 2. To learn English well you have to … . 3. He always … politeness. 4. To be good at it, you need to … year after year, and for your whole life. 5. It was with difficulty that he was induced to stoop from speculation to … .

***Translate into English choosing the right word.***

1. Постійна практика вдосконалюєвміннялюдини в будь-якійгалузі. 2. Спробуймозайматисяпрограмуванням разом. 3. Я надаю перевагу практичному аналізу та перевірцірізнихнауковихприпущень. 4. Моємубратовініколи не подобалосязайматисяанглійською мовою. 5. Працювати, навчаючись на третьомукурсі — цезвичайна практика середстудентівнашогоуніверситету.

***3W.Give the opposites of the following words***

Single, the simplest, general-purpose, accept, in a sequence, specified, to be loaded into, to complete, output, difficult, considerable, multiple, advanced, complexity, inability, advantage, overcome, concurrent, rapid.

***Additional texts***

**Peer-to-Peer Networks**

A peer is considered an equal. All computers on a peer-to-peer network can be considered equals. That is to say, no one computer is in charge of the network’s operation. Each computer controls its own information and is capable of functioning as either a client or a server depending on which is needed at the time.

Peer-to-peer networks are popular as home networks and for use in small companies because they are inexpensive and easy to install. Most operating systems come with peer-to-peer networking capability built in. The only other cost involved with setting up a peer-to-peer network comes into play if a computer does not have a network interface card, or NIC (the device that physically connects your computer to your network’s cabling), already installed. Typical initial peer-to-peer networking involves no security measures. Rather, each peer simply shares its resources and allows others open access to them. In fact, a peer-to-peer network becomes difficult to manage when more and more security is added to the resources. This is because users control their own security by adding password protection to each share they create. Shares are any resources users control on their computers, such as document folders, printers, and other peripherals. Each shared resource can have its own password. Someone wanting access to numerous shared resources has to remember many passwords. Security on a peer to-peer network can quickly become complex and confusing.

 While peer-to-peer networks are inexpensive to set up, they are extremely limited in scope. The accepted maximum number of peers that can operate on a peer-to-peer network is ten. They are, therefore, not appropriate for larger, more secure networks.

Server-Based Networks unlike peer-to-peer networks that operate without central control and are difficult to secure offers centralized control and is designed for secured operations. While there are still both clients and servers on a server-based network, a dedicated server controls the network.

A dedicated server is one that, for all practical purposes, operates solely as a server. A dedicated server on a server-based network services its network clients by storing data, applications, and other resources, and then providing access to those resources when called for by a client. When a client requests a resource such as a document, the server sends the whole resource (the document) over the network to the client, where it is processed and later returned to the server for continued storage. Dedicated servers can also control the entire network’s security from one central location or share that control with other specially configured servers. This central network control also contributes to the economies of scale and makes the server-based network the dominant networking model used in networks today.

**UNIT 9**

**PROGRAMMING**

1. ***Learn the basic vocabulary terms:***

|  |  |
| --- | --- |
| add-on - програма-додаток, додатковийпристрійtoassign -призначатиassembler - трансляторbinarycode - двійковий код compilation - трансляціяcontrol program – керуюча програмаdebugger – відладчик (програми)debug driver налагоджувальна програмаevent-handling code - код обробкиподії | flowcharts - блок-схема, структурна схемаjobs – завдання (*тут*)tohandle – трактуватиloop - цикл (конструкціяпрограми, щозабезпечуєповтореннягрупиоперацій)outline - схема тексту, планprocedure-oriented programming процедурне програмуванняrunning the code on the computer - прогінкодунакомп'ютері |

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

**Programming**

When by using a computer language a program is created to perform specific task, the end product is called software and the process leading to the creation of this software is called software programming. Thus, software programming involves two important aspects the developing a program by using computer language and designing programs for specific tasks and functions.

Software Programming software usually provides tools to assist a programmer in writing computer programs and software using different programming languages in a more convenient way. It shields the application software programmer from the often-complex details of the computer being used. Programming Software includes the following:

* Compilers

A compiler is a software program that transforms high-level source code that is written by a developer in a high-level programming language into a low-level object code (binary code) in machine language, which can be understood by the processor. The process of converting high-level programming into machine language is known as compilation. The processor executes object code, which indicates when binary high and low signals are required in the arithmetic logic unit of the processor. A compiler executes four major steps:

**Scanning**: The scanner reads one character at a time from the source code and keeps track of which character is present in which line.

**Lexical Analysis**: The compiler converts the sequence of characters that appear in the source code into a series of strings of characters (known as tokens), which are associated by a specific rule by a program called a lexical analyzer. A symbol table is used by the lexical analyzer to store the words in the source code that correspond to the token generated.

**Syntactic Analysis**: In this step, syntax analysis is performed, which involves preprocessing to determine whether the tokens created during lexical analysis are in proper order as per their usage.

**Semantic Analysis**: This step is comprised of several intermediate steps. First, the structure of tokens is checked, along with their order with respect to the grammar in a given language. The meaning of the token structure is interpreted by the parser and analyzer to finally generate an intermediate code, called object code. The object code includes instructions that represent the processor action for a corresponding token when encountered in the program. Finally, the entire code is parsed and interpreted to check if any optimizations are possible. Once optimizations can be performed, the appropriate modified tokens are inserted in the object code to generate the final object code, which is saved inside a file.

* Debuggers

A special program used to find errors (bugs) in other programs. A debugger allows a programmer to stop a program at any point and examine and change the values of variables.

* Interpreters

Computer language processor that translates a program line-by-line (statement-by-statement) and carries out the specified actions in sequence. In contrast, an assembler or compiler completely translates a program written in a high-level language (the source program) into a machine-language program (the object program) for later execution. Whereas a compiled-program executes much faster than an interpreted-program, an interpreter allows examination and modification of the program while it is running (executing).

* Assembler

An assembler translates assembly language programs into machine code. The output of an assembler is called an object file, which contains a combination of machine instructions as well as the data required to place these instructions in memory.

* Linker is a computer program that links and merges various object files together in order to make an executable file. All these files might have been compiled by separate assemblers. The major task of a linker is to search and locate referenced module/routines in a program and to determine the memory location where these codes will be loaded, making the program instruction to have absolute references.
* Loader

Loader is a part of operating system and is responsible for loading executable files into memory and execute them. It calculates the size of a program (instructions and data) and creates memory space for it.

* Text editors

A text editor is a type of program used for editing plain text files. Many text editors for software developers include source code syntax highlighting and automatic completion to make programs easier to read and write. Common text editors in Windows environment are Notepad and Textpad.

1. ***Answer the following questions:***
2. What is software programming?
3. What is compiler?
4. What are tokens?
5. What four major steps does compiler execute?
6. What is an object file?
7. What is the main task of a debugger?
8. What is the difference between Linker and Loader?
9. What do text editors include***?***
10. Name the five stages in programming.
11. What are the main function of the System Service Programs?

***4. Say if the statements are true or false***

1. Using different codes shields the application software programmer from the often-complex details of the computer being used.
2. A compiler is a software program that transforms high-level source code into a low-level object code in machine language.
3. A symbol table is used by the lexical analyzer to compile the words in the source code that correspond to the token generated.
4. Syntax analysis is comprised of several intermediate steps.
5. A debugger allows a programmer to stop a program at any point and examine and change the values of variables.
6. Linker calculates the size of a program.
7. Text editors produce code syntax highlighting and automatic completion to make programs easier to read and write.
8. Common text editors in Windows environment are Notepad and Textpad.

***5. Complete the text with verbs from the box:***

|  |
| --- |
| to maintain called subdivided to handle initiatedconsists to link turns queue provide |

1.There are two main kinds of programs which are ..1.. as well. They are control programs and system service programs. There are some control programs ..2.. interruptions, I/O operations, transition between different jobs and different phases of the same job, initial program loading (IPL), and symbolic assignment of I/O devices. Actually, the control program ..3.. of three components: 1. IPL Loader. When system operation is ..4.. , the hardware IPL reads in this program which then clears unused core storage to zeros, generally performs some housekeeping operations, and then reads in the Supervisor. 2. The Supervisor. It can handle execution of any I/O operations and can ..5.. standard processing for all interrupts. It may also ..6.. I/O operations so that the operation will start as soon as the required channel and device are free. 3. Job Control. This program senses and processes all cards; after the new job is loaded, it ..7.. control over to the new job. This system of operation eliminates the necessity of operation intervention between jobs, something which is of particular importance on large computers where the average job time may be less than one minute. System Service Programs are used ..8.. the library; to place new programs into the library, to delete, replace, or change existing programs, to read programs from the library into memory, ..9.. segments of programs written at different times into one program, etc. They are ..10.. Librarian and Linkage Editor.

***6. Guess what is:***

* toinvestigateandfix
* characters in the program move, talk, and interact
* problemswithyourcode
* a program that translates the programming language to machine language
* a piece of code that [runs](https://www.programmingforbeginnersbook.com/blog/expand_your_programming_vocabulary/#run) itself repeatedly.
* combineobjectfilesintoone
* a collection of [binary](https://www.computerhope.com/jargon/b/binary.htm) digits or bits that the computer reads and interprets.
* a software program that enables the computer [hardware](https://www.computerhope.com/jargon/h/hardware.htm) to communicate and operate with the computer [software](https://www.computerhope.com/jargon/s/software.htm).

***7. Match these descriptions with the names of the keys in the box:***

|  |  |
| --- | --- |
| 1. debuggers
2. compiler
3. assembler
4. machine language
5. object code
6. token
7. parser
 | 1. a program that is used to find and correct bugs in other programs
2. a computer program which converts language that people can use into a code that the computer can understand.
3. program used to convert or translate programs written in assembly code to machine code.
4. collection of binary digit binary digits or bits that the computer reads and interprets.
5. a single element of a programming language.
6. a program that is used to break the data into smaller elements coming from lexical analysis phase
 |

1. ***True or false:***



* **WORD-STUDY**

***1W.Choose the right word.***

*waste — spend — lose*

1. He … a weekend in London. 2. There is not a moment to … . 3. He didn’t … his time in eating. 4. All his efforts were … . 5. He … his force. 6. The invaluable by-products are all … and escape into the air in the form of smoke. 7. The plane … its altitude. 8. He likes reading computer magazines and never hesitates to … money on them.

***Translate into English choosing the right word.***

1. Значначастина тепла в цьомупристроївитрачається на випромінювання. 2. Я загубив своїводійські права. 3. Він не збиравсямарнувати час. 4. Вінвтративвсіхсвоїхродичів. 5. Як ви проводите своєдозвілля? 6. Я вирішив не витрачатигроші на проживання в готелі. 7. Вільний час вона проводить, працюючи в саду.

*control — monitor — supervise*

1. A relay is an automatic device that … the setting of a valve, switch, etc., by means of an electric motor, solenoid, or pneumatic mechanism. 2. Big Brother is a television gameshow format in which a small number of people living in accommodation sealed off from the outside world are constantly … by TV cameras. 3. A clerk of works is an employee who … building work in progress or the upkeep of existing buildings. 4. A nanny cam is a camera that transmits images to a computer, used to … children in another location. 5. A switchboard is an installation in a telephone exchange, office, hotel, etc., at which the interconnection of telephone lines is manually … .

***2W. Translate the words combinations and make your own sentences with them:***

|  |  |  |
| --- | --- | --- |
| be content withbe committed tobe composed ofbe envious ofbe familiar withbe relevant tobenefit from | be excited aboutbe exposed tobe faced with (problem / dilemma / decision)be involved withbeg forcomplain about | charge (someone) for something*In this case, "charge" means to require money for a product or service*charge (someone) with something*In this case, "charge" means when someone is formally accused of a crime* |

***3W. Summarize your knowledge on the Participle. Find participles and state their tense.***

1. Invented by Babbage in 1842 and called by its inventor "analytical engine" this machine became the first home computer. 2. Founded by Hollerith, the Tabulating Machine Company changed its name and became known all over the world as the International Business Machine Corporation (IBM). 3. The Automatic Controlled Sequence Calculator resulted from Howard Aiken work was 40 feet long by 10 feet high. 4. It had about the same computing power as a low-priced solar-powered calculator that a schoolchild might use today. 5. The problem concerned complicated processes taking place on the computer market. 6. The production process influenced by the general economic situation is being closely inspected. 7. The formation of the Internet Education Centres in Kiyv followed by other regions proved to be highly successful. 8. Given a special program the machine can translate from Chinese into English and vice versa. 9. The idea of machine-aided calculus having survived numerous ups and downs over the years of its life has only now become a world-wide reality. 10. Having been changed to conform to new ideas, the equations could be applied to problem solving. 11. Having been asked to translate into Chinese "out of sight - out of mind", the machine replied by a row of Chinese hieroglyphs. 12. With job changes occurring regularly, employees leaving, and employees being hired, the problem of information securing becomes especially topical for companies. 13. The Internet providing a new method of doing business must be capable of providing the reliability for the user.

***4W. Translate the sentences paying attention to the form and function of the Participle:***

*1.* The input unit consists of some devices using different means. 2. Performing addition the computer must have two numbers to be added. 3. When pressing the keys, the operator makes the adding machine operate. 4. The operator pressing the keys makes the adding machine operate. 5. A device invented by the German mathematician Leibnitz could control automatically the amount of adding to be performed by a given digit. 6. Logical operations performed by a computer are comparing, selecting, sorting, and determining. 7. Discussing the advantages of the new memory unit the professor gave the students all the necessary explanations. 8. Having punched holes in a card the operator put it into the computer. 9. When passed through the reading equipment the characters are read in a way similar to a way used for a magnetic tape. 10. The density of memorizing elements in MOS memory is very high.

***5W. Translate the following sentences paying attention to the Absolute Participle Construction:***

1. The first automatic computers of the 1940’s not being very reliable, scientists went on improving them. 2. Specialists use computers widely, the latter helping in performing computations at great speeds. 3. Personal computers being used for many purposes, scientists go on improving their characteristics. 4. The computer SM-100 is used in industrial processes and scientific researches, its main function being to carry out reasonable operations with numbers and to calculate complex problems. 5. With the current on, the computer automatically begins operating. 6. A printer’s line is usually between 60 and 150 characters long, with 120 characters being a common length.

***6W. Underline the correct item.***

1) The new program was exciting / excited. 2) What happens to your discarded / discarding old computer? 38 3) Bytes and bits are the starting / started point of the computer world. 4) Americans own billions of electronic products, including / included 200 million computers. 5) E-waste also includes cell phones, DVD players, video cameras and answering / answered machines. 6) Is what we're recycling / recycled actually getting recycled / recycling? 7) The "ray" is a stream of electrons generated / generating by an electron gun that naturally pour off a heated /heating cathode into the vacuum. 8) Random access memory is the most well-known form of computer memory, because it determines how quickly and efficiently your computer can perform your requested / requesting tasks. 9) There are several types of computer memory that are arranged based / basing on both technical and financial concerns. 10) There are several types of computer memory that are arranged based / basing on both technical and financial concerns.

***Additional texts***

*(TEXT 1)* **STAGES IN PROGRAMM**

There are five stages in programming. First, the computations to be performed must be clearly and precisely defined. The over-all plan of the computations is diagramed by means of a so-called flow chart. The second stage is the actual coding. It is often best to write a code in terms of a symbolic language first, for then changes are easily made. Numbers are assigned to the symbols, and the final code is prepared. In the third stage some procedure is used to get the code into the memory of the computer. The fourth stage consists of debugging the code, i.e., detecting and correcting any errors. The fifth and final stage involves running the code on the computer and tabulating the results. In fact, it is well known that a single error in one instruction invalidates the entire code. Hence, programming is a technique requiring attention to details without losing sight of the over-all plan.

*(TEXT 2).***KINDS OF PROGRAMS**

There are two main kinds of programs which are subdivided as well. They are control programs and system service programs. There are some control programs to handle interruptions, I/O operations, transition between different jobs and different phases of the same job, initial program loading (IPL), and symbolic assignment of I/O devices. Actually, the control program consists of three components:

1. IPL Loader. When system operation is initiated, the hardware IPL reads in this program which then clears unused core storage to zeros, generally performs some housekeeping operations, and then reads in the Supervisor.

2. The Supervisor. It can handle execution of any I/O operations and can provide standard processing for all interrupts. It may also queue I/O operations so that the operation will start as soon as the required channel and device are free.

3. Job Control. This program senses and processes all cards; after the new job is loaded, it turns control over to the new job. This system of operation eliminates the necessity of operation intervention between jobs, something which is of importance on large computers where the average job time may be less than one minute.

System Service Programs are used to maintain the library; to place new programs into the library, to delete, replace, or change existing programs, to read programs from the library into memory, to link segments of programs written at different times into one program, etc. They are called Librarian and Linkage Editor.

***1D. Read the program, then complete the sentences which follow.***

*NOTES:*

|  |  |
| --- | --- |
| *comment lines - рядоккоментаря**braces – фігурні дужки**a must – необхідність**parentheses – круглі дужки**semicolon – крапка з комою**to terminate - завершувати**variable name –ім'язмінної* | *assignmentstatement - оператор присвоювання**blankline – порожній рядок**declarationstatement –оператор оголошень**functionstatement – функціональний оператор**to span – захоплювати**terminator –кінцевий запис* |

|  |
| --- |
|  /\*CALCULATE AVERAGES \*/ main ( ) { float a, b, c, d, average;printf (“Enter three numbers: “);scanf (“%f %f %f “, &a, &b, &c); d=a+b+c; average=d/3.0;printf (“The average is %f “, average); } |

***Comment Lines***

A C source program consists of statements and comment lines. Comment lines are enclosed by the characters /\* (at the start of the comment) and \*/ (at the end of the comment).

***The Function main { }***

Every C program must have a function called main which must appear only once in a program. The parentheses following the word main must be present, but there must be no parameters included. The main part of the program is enclosed within braces { }, and consists of declaration statements, assignment statements, and other C functions. In the above program there are six statements within the braces: a declaration statement (the first statement of the main program starting with the word float), two assignment statements (the fourth and fifth statements starting with the variable names d and average), and three function statements, two to print information on the screen and one to scan the keyboard for input.

As C is free-form language, the semicolon (;) at the end of each line is a must. It acts as a statement terminator, telling the compiler where an instruction ends. Free form means that statements can be identified, and blank lines inserted in the source file to improve readability, and statements can span several lines. However, each statement must be terminated with a semicolon. If you forget to include the semicolon, the compiler will produce an error, indicating the next line as the source of the error. This can cause some confusion, as the statement objected to can be correct, yet as a syntax error is produced.

***Variables and the Declaration Statement***

A variable is a quantity that is referred to be name, such as a, b, c, d and average in the above program. A variable can take on many values during program execution, but you must make sure that they are given an initial value, as C does not do so automatically. However, before variables can be used in a program, they must be declared in a type declaration statement.

**UNIT 10**

**PROGRAMMING LANGUAGES**

1. ***Learn the basic vocabulary terms:***

|  |  |
| --- | --- |
| downside – недолікflowchart блок-схема, структурна схемаto implement – здійснювати, впроваджуватиtoidentify – визначати iteration ітерація – (повторення перетворення, що наближає до вирішення), крок циклуinsequence – послідовноlooping – організація циклівNotational system – цифровийзаписpattern – зразок | utilization – використанняquery language – мовазапитівreport writer – мовазнаписаннязвітівsequence – послідовністьsequential execution – послідовне виконанняsequence error – порушення впорядкованості tosimplify – спрощуватиtoskip – пропускати, обходитиwalkthrough – наскрізний контроль withdrawn – вилучений, скасований |

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

**PROCEDURAL PROGRAMMING**

The traditional approach to programming uses a procedural paradigm (sometimes called “imperative paradigm”) to conceptualize the solution to a problem as a sequence of steps. A program written in a procedural language typically consists of self-contained instructions in a sequence that indicates how a task is to be performed or a problem is to be solved.

A programming language that supports the procedural paradigm is called a procedural language. Procedural languages are well suited for problems that can be easily solved with a linear, or step–by-step, algorithm. Programs created with procedural languages have a starting point and an ending point. The flow of execution from the beginning to the end of the program is essentially linear – that is, the computer begins at the first instruction and carries out the prescribed series of instructions until it reaches the end of the program.

An algorithm is a set of steps for carrying out a task that can be written down and implemented. An algorithm for a computer program is a set of steps that explains how to begin with known information specified in a problem statement and how to manipulate that information to arrive a solution. In a later phase of the software development process, the algorithm is coded into instructions written in a programming language so that a computer can implement it.

To design an algorithm, you might begin by recording the steps you take to solve the problem manually. The computer also needs the initial information, so the part of your algorithm must specify how the computer gets it. Next, your algorithm should also specify how to manipulate this information and, finally, how the computer decides what to display as the solution.

You can express an algorithm in several different ways, including structured English, pseudocode, and flowcharts. These tools are not programming languages, and they cannot be processed by a computer. Their purpose is to give you a way to document your ideas for program design.

Structured English is a subset of the English language with a limited selection of sentence structures that reflects processing activities. Another way to express an algorithm is with pseudocode. Pseudocode is a notational system for algorithms that has been described as a mixture of English and your favorite programming language.

A third way to express an algorithm is to use a flowchart. A flowchart is a graphical representation of the way a computer should progress from one instruction to the next when it performs a task.

Before finalizing the algorithm for a computer program, you should perform a walkthrough to verify that your algorithm works. To perform a walkthrough for a simple program, you can use a calculator, paper, and pencil to step through a sample problem using realistic “test” data.

For more complex programs, a walkthrough might consist of a verbal presentation to a group of programmers who can help identify logical errors in the algorithm and suggest ways to make the algorithm more efficient.

The algorithm specifies the order in which program instructions are performed by the computer. Unless you do otherwise, sequential execution is the normal pattern of program execution. During sequential execution, the computer performs each instruction in the order it appears – the first instruction in the program is executed first, then the second instruction, and so on, to the last instruction in the program.

Some algorithms specify that a program must execute instructions in an order different from the sequence in which they are listed, skip some instructions under certain circumstances, or repeat instructions. Control structures are instructions that specify the sequence in which program is executed. Most programming languages have three types of control structures: sequence controls, selection controls, and repetition controls.

A sequence control structure changes the order in which instructions are carried out by directing the computer to execute an instruction elsewhere in the program. A sequence control structure directs the computer to the statements they contain, but when these statements have been executed, the computer neatly returns to the main program.

A selection control structure, also referred to as a “decision structure” or “branch”, tells a computer what to do, based on whether a condition is true or false. A simple example of a selection control structure is the IF…THEN…ELSE command.

A repetition control structure directs the computer to repeat one or more instructions until certain condition is met. The section of code that repeats is usually referred to as a loop or “iteration”. Some of the most frequently used repetition commands are FOR…NEXT, DO…WHILE, DO…UNTIL, and WHILE…WEND (which means “while ends”).

All the first programming languages were procedural. The first widely used standardized computer language, FORTRAN, with its procedural paradigm set the pattern for other popular procedural languages, such as COBOL, APL, ALGOL, PL/1, PASCAL, C, ADA, and BASIC.

The procedural approach is best suited for problems that can be solved by following a step-by-step algorithm. It has been widely used for transaction processing, which is characterized by the use of a single algorithm applied to many different sets of data. For example, in banking industry, the algorithm for calculating checking account balances is the same, regardless of the amounts deposited and withdrawn. Many problems in math and science also lend themselves to the procedural approach.The procedural approach and procedural languages tend to produce programs that run quickly and use system resources efficiently. It is a classic approach understood by many programmers, software engineers, and system analysts. The procedural paradigm is quite flexible and powerful, which allows programmers to apply it to many types of problems.

The downside of the procedural paradigm is that it does not fit gracefully with certain types of problems – those that are unstructured or those with very complex algorithms. The procedural paradigm has also been criticized because it forces programmers to view problems as a series of steps, whereas some problems might better be visualized as interacting objects or as interrelated words, concepts, and ideas.

***3. Answer the following questions:***

1. What is procedural programming?

2. What is an algorithm?

3. How do you write an algorithm?

4. What is the best way to express an algorithm?

5. How do you know if your algorithm is correct?

6. In what order does a computer perform program instructions?

7. Can the computer make decisions while it executes a program?

8. What is the downside of the procedural paradigm?

9. What kinds of problems are best suited to the procedural approach?

10. What are the advantages and disadvantages of the procedural paradigm?

***4. Indicate the paragraph where the following ideas are found in the text.***

1. A program written in a procedural language contains the prescribed series of instructions.

2. An algorithm shows the steps how to manipulate the information to arrive at a solution.

3. There are different tools to express an algorithm.

4. To make sure that your algorithm works, you should verify it.

5. Program instructions can be executed in order they are listed, or some instructions can be skipped or repeated.

6. Many problems in banking industry lend themselves to the procedural approach.

***5. Choose words from the box to fill in the text:***

|  |
| --- |
| looping order discipline require request logic description |

Procedural language is a language requiring the use of programming ..1.. . Programmers, writing in procedural languages must develop a proper ..2.. of actions to solve the problem, based on the knowledge of data/information processing operations and programming techniques, such as ..3.. . All conventional programming languages are procedural languages. Non-procedural language is a language which does not ..4.. programming techniques. Non-procedural languages allow a user or a programmer to express a ..5… to the computer in English-like statements, which specify what is to be done rather than how it is to be done. Query languages, report writers, and financial planning languages are examples of non-procedural languages. Non-procedural languages generate the necessary program ..6 for the computer directly from a user’s ..7.. of the problem.

***6. Match up the words that are opposite in meaning.***

sequential parallel algorithm

downside problem

to focus written

solution advantage

to deposit to distract

linear algorithm random

verbal to withdraw

***7. Fill in the blanks choosing from the variants given.***

1. During … execution,the computer performs each instruction in the order it appears – the first instruction in the program is executed first, then the second instruction, and so on, to the last instruction in the program.

a) random b) sequential c) direct d) reverse

2. The main ... of procedural paradigm is that it forces programmers to view problems as a series of steps, whereas some problems might better be visualized as interacting objects or as interrelated words, concepts, and ideas.

a) benefit b) advantage c) drawback d) downside

3. The fact that algorithms are usually written in a format that is not specific to a particular programming language allows you … on formulating a correct algorithm.

a) to concentrate b) to focus c) to distract

4. The traditional approach to programming uses a procedural paradigm to conceptualize the … a problem as a sequence of steps.

a) problem b) decision c) solution

5. The algorithm for calculating checking account balances is the same, regardless of the amounts … and.... .

a) invested, placed, deposited b) drawn out, withdrawn, taken away

6. Procedural languages are well suited for problems that can be easily solved with … algorithm.

a) chain b) linear c) parallel

7. For complex programs, a walkthrough might consist of a... presentation to a group of programmers who can help identify logical errors in the algorithm and suggest ways to make the algorithm more efficient.

a) written b) graphical c) verbal

***8. Make three-word combinations using the words in columns and then fill in the gaps in the following sentences.***

A: selection B: account C: instruction

self step-by-step algorithm

software computer balances

standardized development language

checking control process

linear contained structure

1. The procedural approach is best suited for problems that can be solved by following a …
2. A …, also referred to as a “decision structure” or “branch”, tells a computer what to do, based on whether a condition is true or false.
3. The first widely used …, FORTRAN, with its procedural paradigm set the pattern for other popular procedural languages.
4. In banking industry, the algorithm for calculating … is the same.
5. A program written in a procedural language typically consists of ... in a sequence that indicates how a task is to be performed or a problem is to be solved.
6. The algorithm is coded into instructions written in a programming language which a computer can implement in a later phase of the … .

***9. Fill in the gaps in the text.***

Languages such as COBOL and FORTRAN support a traditional approach to programming called the \_\_\_ paradigm, which is based on a step-by-step \_\_\_. Procedural languages provide a variety of \_\_\_ structures that allow programmers to specify the order of program execution. A \_\_\_ control structure directs the computer to execute instructions, not coded as a simple succession of steps. A \_\_\_ control provides a choice of paths, based on whether a condition is true or false. A \_\_\_ control, or “loop”, repeats one or more instructions until a certain condition is met. Procedural languages produce programs that run quickly and use \_\_\_ resources efficiently.

* **WORD-STUDY**

Exercise 227. Supply appropriate preposition.

1. I am not familiar \_\_ that author's works.

2. He doesn't approve \_\_ smoking.

3. I subscribe \_\_ several magazines.

4. Water consists \_\_ oxygen and hydrogen.

5. I became uncomfortable because she was staring \_\_ me.

6. She hid the candy \_\_ the children.

7. He never argues \_\_ his wife.

8. I arrived \_\_ this country two weeks ago.

9. We arrived \_\_ the airport ten minutes late.

10. Has Mary recovered \_\_ her illness?

11. I pray\_\_peace.

12. I am envious \_\_ people who can speak three or four languages fluently.

13. Why are you angry \_\_ me? Did I do something wrong?

14. They are very patient \_\_ their children.

15. The students responded \_\_ the questions.

Exercise 228. Complete the sentences with among and between.

1. I was sitting \_\_ my two sisters when he came in.

2. Mother divided the cake \_\_ her three children.

3. I can't see any difference \_\_ these two maps.

4. They spent their holidays \_\_ the mountains.

5. They found the boy \_\_ the bushes in the garden.

6. She invited Jane \_\_ others.

7. These two brothers can never agree \_\_ themselves.

8. This family are always quarreling \_\_ themselves.

9. Just \_\_ ourselves, I can't stand that man.

10. The railway line runs \_\_ the road and the river

Exercise 232. Choose the correct word in the following sentences.

1. We cannot believe that he is the man \_\_ saved you from drowning.

(A) that (B)whom (C) who (D) whose

2. The only thing \_\_ stopped her from going to study abroad was the pleading of her

grandmother.

(A) who (B) which (C) whom (D) why

3. Most folk songs are ballads \_\_ have simple words and tell simple stories.

(A) what (B) although (C)with (D)that

4. \_\_ other mammals, whales do not have a sense of smell.

(A) not alike (B) unlike (C) unlikely (D) dislike

5. John missed the neighborhood \_\_ he had grown up.

(A) in which (B) in where (C) which (D) that

6. I \_\_ like the film nor the novel it's based on.

(A) both (B) neither (C) so (D) either

7. \_\_ my brother and I were upset when we heard the news.

(A) both (B)and (C) neither (D) either

8. I met Tom \_\_ I was waiting for the bus.

(A) while (B) during (C) then (D) for

9. I have travelled a lot \_\_ by train and by plane.

(A) both (B) and (C) or (D) either

10. I wouldn't like to go to Scotland. – I wouldn't like to go \_\_ .

 (A) neither (B) too (C) either (D) both

11. He failed the test \_\_ he had studied hard.

(A) in spite of (B) because (C) as well as (D) although

12. The friend \_\_ party I went to is a pianist.

(A) who (B)whose (C) which (D) those

13. I wonder \_\_ he will come in time.

(A) weather (B) whether (C)what (D)that

14. \_\_ walking for three hours we were tired.

(A) 14. \_\_ walking for three hours we were tired.

(A) during (B) since (C) before (D) after

15. North Carolina is well known not only for the Great Smoky Mountains Natural

Park \_\_ for the Cherokee Indian Settlements.

1. also (B) and (C) but also (D) because of

Exercise 233. Choose the word that correctly completes each sentence below.

1. Stanley, a black cat, won Friday's contest, (but, for) he failed to win the contest on

Saturday.

2. The Murrays plan to move, (for, yet) they have outgrown their one-room

apartment.

3. My car's heater is noisy (and, nor) it heats very poorly.

4. Psychologists report that having one or more friends is important to a child's

development, (but, for) being popular is not.

5. A foot-pound is used to measure energy, (but, for) a pound-foot is used to measure

torque.

6. One of the largest jigsaw puzzles ever completed contained 10,000 pieces, (and, or)

it took 2,500 hours to complete.

7. At about eighteen miles into a race, marathons runners often feel that they cannot

go on, (for, yet) they usually get a second wind and finish the race.

8. Rocky Mountain National Park contains 355 miles of trails, (nor, so) visitors can

hike as far and as high as they wish.

9. Incandescent bulbs neither use as little electricity as fluorescent bulbs, (nor, yet) do

they last as long.

Exercise 240. 1) Write the letter of the choice that is most nearly the same in meaning

as the word on the left.

1. a fiction

(A) falsehood (B) fact (C) books (D) words

2. a theory

(A) research (B) thought (C) question (D) explanation

3. to overwhelm

(A) climb (B) overpower (C) finish (D) rebuild

4. security

(A) courage (В) danger (С) protection (D) happiness

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5. to determine

(A) go around (B) find out (C) delay (D) work

6. an emotion

(A) movement (B) reason (C) feeling (D) goal

7. an impression

(A) opinion (B) result (C) income (D) example

8. to investigate

(A) examine (B) hire (C) accuse (D) admire

9. to convince

(A) find guilty (B) annoy (C)join (D) persuade

10. to preserve

(A) protect (B) serve (C) get ready (D) destroy

11. dramatic

(A) noisy (B) hidden (C) very noticeable (D) very famous

12. economical

(A) funny (B) thrifty (C) wasteful (D) simple

13. a burden

(A) sound (B) package (C) detail (D) hardship

***Additional texts***

1. SQL

It’s no surprise SQL (pronounced ‘sequel’) tops the job list since it can be found far and wide in various flavors. Database technologies such as MySQL, PostgreSQL and Microsoft SQL Server power big businesses, small businesses, hospitals, banks, universities. Indeed, just about every computer and person with access to technology eventually touches something SQL. For instance, all Android phones and iPhones have access to a SQL database called SQLite and many mobile apps developed Google, Skype and DropBox use it directly.

 2. Java

The tech community recently celebrated the 20th anniversary of Java. It’s one of the most widely adopted programming languages, used by some 9 million developers and running on 7 billion devices worldwide. It’s also the programming language used to develop all native Android apps. Java’s popularity with developers is due to the fact that the language is grounded in readability and simplicity. Java has staying power since it has long-term compatibility, which makes sure older applications continue to work now into the future. It’s not going anywhere anytime soon and is used to power company websites like LinkedIn.com, Netflix.com and Amazon.com.

3. JavaScript

JavaScript – not to be confused with Java or mean stack development – is another one of the world’s most popular and powerful programming languages, and is used to spice up web pages by making them interactive. For example, JavaScript can be used to add effects to web pages, display pop-up messages or to create games with basic functionality. It’s also worth noting that JavaScript is the scripting language of the World Wide Web and is built right into all major web browsers including Internet Explorer, FireFox and Safari. Almost every website incorporates some element of JavaScript to add to the user experience, adding to the demand for JavaScript developers. In recent years JavaScript has also gained use as the foundation of Node.js, a server technology that among other things enables real-time communication.

 4. C#

Dating from 2000, C# (pronounced C-sharp) is a relatively new programming language designed by Microsoft for a wide range of enterprise applications that run on the .NET Framework. An evolution of C and  C++, the C# language is simple, modern, type safe and object oriented.

 5. C++

C++ (pronounced C-plus-plus) is a general purpose object-oriented programming language based on the earlier ‘C’ language. Developed by Bjarne Stroustrup at Bell Labs, C++ was first released in 1983. Stroustrup keeps an extensive list of applications written in C++. The list includes Adobe and Microsoft applications, MongoDB databases, large portions of Mac OS/X and is the best language to learn for performance-critical applications such as “twitch” game development or audio/video processing.

 6. Python

Python is a general purpose programming language that was named after the Monty Python (so you know it’s fun to work with)! Python is simple and incredibly readable since it closely resembles the English language. It’s a great language for beginners, all the way up to seasoned professionals. Python recently bumped Java as the language of choice in introductory programming courses with eight of the top 10 computer science departments now using Python to teach coding, as well as 27 of the top 39 schools. Because of Python’s use in the educational realm, there are a lot of libraries created for Python related to mathematics, physics and natural processing. PBS, NASA and Reddit use Python for their websites.

 7. PHP

Created by Danish-Canadian programmer Rasmus Lerdorf in 1994, PHP was never actually intended to be a new programming language. Instead, it was created to be a set of tools to help Rasmus maintain his Personal Home Page (PHP). Today, PHP (Hypertext Pre-Processor) is a scripting language, running on the server, which can be used to create web pages written in HTML. PHP tends to be a popular language since its easy-to use by new programmers, but also offers tons of advanced features for more experienced programmers.

 8. Ruby on Rails

Like Java or the C language, Ruby is a general purpose programming language, though it is best known for its use in web programming, and Rails serves as a framework for the Ruby Language. Ruby on Rails has many positive qualities including rapid development, you don’t need as much code, and there are a wide variety of 3rd party libraries available. It’s used from companies ranging from small start-ups to large enterprises and everything in-between. Hulu, Twitter, Github and Living Social are using Ruby on Rails for at least one of their web applications.

9. iOS/Swift

In 2014, Apple decided to invent their own programming language. The result was iOS Swift – a new programming language for iOS and OS X developers to create their next killer app. Developers will find that many parts of Swift are familiar from their experience of developing in C++ and Objective-C. Companies including American Airlines, LinkedIn, and Duolingo have been quick to adopt Swift, and we’ll see this language on the rise in the coming years.

**UNIT 11**

**DATABASE**

* + - 1. ***Learn the basic vocabulary terms:***

|  |  |
| --- | --- |
| cardinality –   кардина́льнечисло́, поту́жністьconsistency – несупере́чність, послідо́вність, consistency error –по́ми́лкаче́резнесумі́сність (форматівтощо) inconsistent –супере́чливийdatabase –ба́зада́них database management –систе́макерува́нняба́замида́них, СКБДdatabase processing –це́нтрдо́ступудоба́зида́них database application – застосо́внапрогра́ма, щопрацю́єзба́зоюда́них in-memory database –резиде́нтнабазаданихentity – суть , су́тність, одини́ця, ці́ле application entity –прикладни́йкомпоне́нт (системипрограмовихзасобів)  | data entity –інформаці́йнийоб’є́кт; об’є́ктда́них drawing entity –графі́чнийприміти́вindex (мн. indices) – пока́зник fog index –і́ндекснезрозумі́лості (показникякостітехнічногоописупрограмичисистеми) destination index –і́ндекс-регі́ст(е)радреса́та dummy index –німи́йі́ндекс relevant – доцільний, доречнийrandomaccess –дові́льнийдо́ступremoteaccess –дистанці́йневибира́ння; sequencing – встано́влюванняпослідо́вності, упорядко́вування scope– область дії scope of a problem –обсяг задачіscoperesolution– виявлення за контекстом |

***2. Read and translate the text:***

**DATABASE**

The non-technical dictionary meaning of database is “a store of a large amount of information, especially in a form that can be handled by a computer”. A database is a collection or set of related data arranged-logically in a structured form designed to meet the information requirement on non-redundant operational data which are sharable between different application systems. The advantage with a database is that the data remains independent of the application programs that use them. Further, the data is accessible to any program with a legitimate need for them, regardless of where the data is physically located. It is also accessible to any program regardless of the language in which the program is written. Data are not duplicated in different locations. A database basically comprises data elements or fields each of which contains a data value about an attribute of a particular entity.

Databases can be roughly divided into two types, simple and complex. Complex databases can be further divided into hierarchical, network and relational databases. Before examining these types of databases, it is necessary to define three key terms.

**A file** is a collection or set (ordered or unordered) of data elements stored on storage media. A system software module is responsible for managing (reading, processing, deleting, etc.) a file.

**Record** is a set of logically related fields. Cardinality of this set may be fixed or variable, i.e., a record size may be fixed or variable. A file, therefore, is a collection of logically related records.

**Field** is the smallest (fixed) indivisible logical unit of a file. A field holds a part of some data value.

Simple databases typically consist of one file with many records consisting of one or more fields. Alternatively, a simple database might consist of a single data file as well as one or more index files. Data files can be thought of as having two types of ordering or sequencing. The physical order of a database is the actual order in which the data is stored in the file. The logical order is the order in which we might choose to access that data. The logical order needs not to be the same as the physical order. If the two types of order are not the same, however, it is necessary to have some mechanism for access the data in a physically non-sequential order. This is typically achieved using an index file. This is very similar to a book index where topics are listed alphabetically (the logical order) and the reader is referred to the page number on which each topic is found (physical order). Some books have more than one index (e.g. Author index and subject index) which refer to the single physical sequence (page numbering). Multiple indexes are also possible even on simple computer databases. For example, in a mailing list database you may have an index to names and an index to suburbs or towns.

An index is often also useful as a quick way to find things in a file even when logical and physical order are the same. This is because a complete record may contain many fields whilst an index record may only contain the indexed field and an access number. Index files are, because of this, generally much smaller than the actual data file and so much quicker to scan sequentially. Simple databases might include booklists, bibliographies, mailing lists, etc...

The files in a complex database must be linked together in some way. Such links between the files must be invisible to the user. To the user a complex database must appear to be a single integrated entity. Further, it must be possible to produce reports from many files using simple instructions. There are three common ways of linking complex databases:

 *Hierarchical Model*

This type of database utilizes a pyramid-like structure with several levels. Files within the database can be nodes located at a particular level in the database and connected to one node in the level above and one or more nodes in the level below. A node on a level closer to the apex is the "parent" of a node connected to it on the next lower level. The lower level node is the "child" of the higher-level node that it is connected to. Each child has only one parent, each parent can have one or more children.

In a hierarchical model, data stored at a node can only be accessed at that level or at the level of its parent. Data cannot be exchanged between nodes at the same level without going through the lowest common parent (or grandparent). Such a structure is common in large organizations where data within a branch is accessible to members of that branch and to head office, but not to another branch (without a request for information via head office). Security and central control are strong motivations for this type of database structure.

*Network model*

Like the hierarchical model, the network model consists of multiple levels and parent and child nodes. Unlike the hierarchical model it is not pyramidal, and not only can parent nodes have more than one child, but child nodes can have more than one parent. Information can flow in both directions much more flexibly and the various levels can interact much more freely in the network model. Nodes on various levels are much more equal than in a hierarchical model. Ready interchange of information and the facilitation of consultative processes are the main motivations behind this type of model.

 *Relational model*

The relational model differs from the above two models in that its main emphasis is not on the control of relationships between levels of the database. It is more a method of linking various types of information into a single database. In a relational database each record of each file has at least one link field which is used to link the data in different files. The student number is a common link field in a University database. On one file a student's name, address, etc. What is will be listed along with the student number. In another file student numbers will appear against course numbers. In another file course number will appear along with details about the course. In yet another file, details of all unpaid library fines will indicate student number versus the amount owed. In the database the numbers will be defined as link fields and database is designed to allow easy access to relevant information in the various files. For example, if you are interested in a list of all students in a course you simply request such a list and the database will get the student numbers from the course list, and then use those numbers to get the student names from another file. These linkages will be transparent to the user who will only see a course list containing student names.

*Text 2***TYPES OF DATABASES**

Depending upon the usage requirements, there are following types of databases available in the market.

**1. Centralized Database**

The information(data) is stored at a centralized location and the users from different locations can access this data. This type of database contains application procedures that help the users to access the data even from a remote location.

**2. Distributed Database**

Just opposite of the centralized database concept, the distributed database has contributions from the common database as well as the information captured by local computers also. The data is not at one place and is distributed at various sites of an organization. These sites are connected to each other with the help of links which helps them to access the distributed data easily.

**3. Personal Database**

Data is collected and stored on personal computers which is small and easily manageable. The data is generally used by the same department of an organization and is accessed by a small group of people.

**4. End User Database**

The end user is usually not concerned about the transaction or operations done at various levels and is only aware of the product which may be a software or an application. Therefore, this is a shared database which is specifically designed for the end user, just like different levels’ managers. Summary of whole information is collected in this database.

**5. Commercial Database**

These are the paid versions of the huge databases designed uniquely for the users who want to access the information for help. These databases are subject specific, and one cannot afford to maintain such a huge information. Access to such databases is provided through commercial links.

**6. nosql Database**

These are used for large sets of distributed data. There are some big data performance issues which are effectively handled by relational databases, such kind of issues are easily managed by NoSQL databases. There are very efficient in analyzing large size unstructured data that may be stored at multiple virtual servers of the cloud.

**7. Operational Database**

Information related to operations of an enterprise is stored inside this database. Functional lines like marketing, employee relations, customer service etc. Require such kind of databases.

**8. Relational Databases**

A relational database is a set of formally described tables from which data can be accessed or reassembled in many ways without having to reorganize the database tables.  The Structured Query Language (SQL) is the standard user and application program interface for a relational database.

**9. Cloud Databases**

Acloud database is a database service built and accessed through a cloud platform. It serves many of the same functions as a traditional database with the added flexibility of cloud computing. Users install software on a cloud infrastructure to implement the database. There are various benefits of a cloud database. Users can access cloud databases from virtually anywhere, using a vendor’s API or web interface. Acloud databaseEnables enterprise users to host databases without buying dedicated hardware. In the event of a natural disaster, equipment failure or power outage, data is kept secure through backups on remote servers.

**10. Object-Oriented Databases**

An object-oriented database is a collection of object-oriented programming and relational database. There are various items which are created using object-oriented programming languages like C++, Java which can be stored in relational databases, but object-oriented databases are well-suited for those items.

An object-oriented database is organized around objects rather than actions, and data rather than logic. For example, a multimedia record in a relational database can be a definable data object, as opposed to an alphanumeric value.

**11. Graph Databases**

The graph is a collection of nodes and edges where each node is used to represent an entity and each edge describes the relationship between entities. A graph-oriented database, or graph database, is a type of nosql database that uses graph theory to store, map and query relationships.

Graph databases are basically used for analyzing interconnections. For example, companies might use a graph database to mine data about customers from social media.

***3. Answer the following questions:***

1. What is database?
2. What are advantages with a database?
3. What are differences between simple and complex database?
4. How does index file work?
5. How does *Hierarchical Model work?*
6. How do *Network model and Relational model differ?*
7. What are the benefits of a cloud database?
8. What are the peculiarities of an object-oriented database?
9. What is a graph database used for?
10. What are the differences between the centralized database and distributed database?

***4. Say if the statements are true or false***

1. Data can be easily duplicated in different locations.
2. Fieldis a collection of logically related records.
3. Simple databases typically consist of one file with many records.
4. The logical order of a database is the actual order in which the data is stored in the file.
5. The logical order needs to be the same as the physical order.
6. The network model consists of multiple levels and is pyramidal.
7. The relational model controls the relationships between levels of the database.
8. Centralized Databasecontains application procedures that help the users to access the data.
9. End User Databaseis accessed by a small group of people.
10. A graph-oriented database is a type of nosql database.

***5. Translate the following sentences and pay special attention to the bold words or phrases.***

The simplest type of database search is a simple search for a single **text token** (which can be a word, a phrase or some of the extent of text). 2. Databases can easily hold and provide access to data in the order of millions of rows, organized into hundreds of tables, all running on a basic server, without **breaking a sweat**. 3. Relational databases scale well, but usually only when that scaling happens on a single server. 4. Every **non-failing node** in the system can always accept read and write requests by clients and will eventually return with a meaningful response, i.e. not with an error message. 5. Traditional SQL databases such as PostgreSQL have been built to provide the full functional package: a very flexible data model, sophisticated **querying capabilities** including joins, global integrity constraints and transactional guarantees. 6. Several distributed relational database systems such as Oracle RAC or IBM DB2 pureScale rely on a **shared-disk architecture** where all database nodes access the same central data repository (e.g. a NAS or SAN). 7. Thus, high scalability in throughput and data volume is achieved by **sharding** (partitioning) data across different nodes (**shards**) in the system.

***6. Match the terms with the appropriate definitions.***

***8. Guess what is:***

***9. Match these descriptions with the names of the keys in the box:***

* **WORD-STUDY**

***1W. Translate the sentences into Ukrainian. Point out the Gerundial Constructions.***

1. Our having accomplished the work so quickly surprised everybody. 2. Some doctors object to children's playing computer games too often. 3. A good way to learn about a company's doing business on the Net is through the Commerce Net. 4. You can't start work without a precaution against a computer failure being taken. 5. Computers were appreciated for their having completely changed many fields of human activity. 6. Computer expert system advising a user how to solve a problem approaches to a human expert. 7. The old companies were afraid of being removed from the market by the recently appeared companies. 8. The great advantage of the so-called graphic computers lies in solving design problems. 9. Having spent half an hour waiting for their home page to load some users are gradually getting nervous. 10. On leaving school I hoped to find a job that would suit my dispositions.

***2W. State the functions of the Gerund. Translate the sentences:***

 1. Logical operations consist of comparing, selecting, sorting, matching, and determining. 2. The way of solving this problem is very difficult. 3. After performing calculations a computer displays a result. 4. A set of marks or signs can be stored by polarizing little spots on a magnetic surface. 5. Differentiating and integrating are algebraic operations. 6. Registers are used for storing information. 7. Blaze Pascal’s merit consists in his constructing the first mechanical computer. 8. By performing the reasonable operations on a computer we solve different kinds of problems for our national economy.

***3W. Translate into English using the Gerund:***

1. Комп'ютервикористовується для вирішенняскладнихзавдань. 2. Форми часто містять кнопки та іншіелементикерування, використовуючиякі, можнавиконуватирізнізавдання. 3. Одним ізспособівзберіганняінформаціївсерединіобчислювальноїмашини є зберігання за допомогою ряду поляризованихточок на магнітнійповерхні. 4. Редагуючидані у табличному поданніоновлюванихзапитів, можназмінюватидані в базовихтаблицях. 5. Використовуючиформи, такожможнакеруватитим, як іншікористувачівзаємодіютьізданими в базіданих. 6. Ви можете створити базу даних без форм, просто редагуючидані в табличному поданні. 7.  Зберігаючивідомості про працівників, сліднастроїтивідповіднутаблицю, у яку дані кожного працівникапотрібно ввести лише раз.

***4W. Complete the sentences, using gerund.***

1. He never thought of \_\_\_\_.

2. This student is very clever at \_\_\_\_\_.

3. I don’t insist on \_\_\_\_.

4. We were tired of \_\_\_\_\_.

5. Did you succeed in \_\_\_\_?

6. Who is responsible for \_\_\_\_?

7. They were grateful for \_\_\_\_.

8. He had some difficulty in \_\_\_\_.

* ***Additional texts***
* Database Searching, Boolean Logic and Query Languages

The simplest type of database search is a simple search for a single text token (which can be a word, a phrase or some ot he extent of text). Boolean logic can be used to greatly extend the scope of database text searches. The mostbasicbooleanoperatorsarelistedbelow.

|  |  |  |
| --- | --- | --- |
| **Expression** | **Expressionistrueif:-** | **EffectonScope** |
| A **AND** B | A and B are both present | decreasesscope |
| A **OR** B | Either A or B, or both A and B, are present | increasesscope |
| A **XOR** B | Either A or B, but not both, is present |  |
| A **NOR** B | Neither A nor B are present |  |
| A **NAND** B | One of A or B is present or neither are present |  |
| **NOT** A | A isnotpresent |  |

Sometimes proximity is also considered during a search. For example, some database search algorithms include a "NEAR" operator. "A NEAR B" in such systems means "both A and B occur, and A is near B". Ideally a user should be able to define "NEAR" for the purpose of a search.

In the above table "scope" refers to the potential for matches to the search criteria. In the latter three cases the number of matches can either increase or decrease relative to the number of matches obtained for a search on either A or B alone.

Web search engines use a limited sub-set of the above operators (most often just AND and OR. Standard database query languages, such as Structured Query Language (SQL), are used by commercial (and some open source) Database Management Systems (DBMS). These include and greatly extend the functionality of the Boolean operators. Such languages permit complex end-user queries, however a great deal of automatic database functionality is still provided by special-purpose programs.

Various scripting languages, such as Perl, Tcl/Tk, or Python also facilitate certain types of database manipulation, especially to text databases and documents. The specialised requirements of speech and language databases have often resulted in the development of special-purpose query languages.

**UNIT 12**

**COMPUTER VIRUS**

* + - 1. ***Learn the basic vocabulary terms:***

|  |  |
| --- | --- |
| bypass –обходитиbotcontagious– інфекційний, заразнийdestructive–руйнівний, згубнийdormant–бездіяльний, неактивнийfileinfector–файловий вірусillicit– заборонений, нелегітимнийmalware– шкідливі програми macrosequences–послідовність команд | keystroke – натискання клавішіoccurrence– випадок, подія, пригодаparlance– манераpayload– корисна інформація пакетуrootkit – інструментарій приховування слідів злому системиtoreplicate–тиражувати, імітувати totrigger– приводити у дію, запускати |

***2. Read and translate the text:***

A computer virus, much like a flu virus, is designed to spread from host to host and has the ability to replicate itself. Similarly, in the same way that flu viruses cannot reproduce without a host cell, computer viruses cannot reproduce and spread without programming such as a file or document.In more technical terms, a computer virus is a type of malicious code or program written to alter the way a computer operates and is designed to spread from one computer to another. A virus operates by inserting or attaching itself to a legitimate program or document that supports macros in order to execute its code. In the process, a virus has the potential to cause unexpected or damaging effects, such as harming the system software by corrupting or destroying data.

Once a virus has successfully attached to a program, file, or document, the virus will lie dormant until circumstances cause the computer or device to execute its code. For a virus to infect your computer, you have to run the infected program, which in turn causes the virus code to be executed.This means that a virus can remain dormant on your computer, without showing major signs or symptoms. However, once the virus infects your computer, the virus can infect other computers on the same network. Stealing passwords or data, logging keystrokes, corrupting files, spamming your email contacts, and even taking over your machine are just some of the devastating and irritating things a virus can do.

While some viruses can be playful in intent and effect, others can have profound and damaging effects. This includes erasing data or causing permanent damage to your hard disk. Worse yet, some viruses are designed with financial gains in mind.

**How do computer viruses spread?**

In a constantly connected world, you can contract a computer virus in many ways, some more obvious than others. Viruses can be spread through email and text message attachments, Internet file downloads, and social media scam links. Your mobile devices and smartphones can become infected with mobile viruses through shady app downloads. Viruses can hide disguised as attachments of socially shareable content such as funny images, greeting cards, or audio and video files.To avoid contact with a virus, it’s important to exercise caution when surfing the web, downloading files, and opening links or attachments.

**What are the signs of a computer virus?**

It is vital for any computer user to be aware of these warning signs –

• Slower system performance
• Pop-ups bombarding the screen
• Programs running on their own
• Files multiplying/duplicating on their own
• New files or programs in the computer
• Files, folders or programs getting deleted or corrupted
• The sound of a hard drive

 **What are the different types of computer viruses?**

**#Macroviruses:**
As the name suggests, the macro viruses particularly target macro language commands in applications like Microsoft Word. The same is implied on other programs too.In MS Word, the macros are keystrokes that are embedded in the documents or saved sequences for commands. The macro viruses are designed to add their malicious code to the genuine macro sequences in a Word file. However, as the years went by, Microsoft Word witnessed disabling of macros by default in more recent versions. Thus, the cybercriminals started to use social engineering schemes to target users. In the process, they trick the user and enable macros to launch the virus.Since macro viruses are making a comeback in the recent years, Microsoft quickly retaliated by adding a new feature in Office 2016. The feature enables security managers to selectively enable macro use. As a matter of fact, it can be enabled for trusted workflows and blocked if required across the organization.

**#Overwrite Viruses:**

The virus design purpose tends to vary and Overwrite Viruses are predominantly designed to destroy a file or application’s data. As the name says it all, the virus after attacking the computer starts overwriting files with its own code. Not to be taken lightly, these viruses are more capable of targeting specific files or applications or systematically overwrite all files on an infected device.On the flipside, the overwrite virus is capable of installing a new code in the files or applications which programs them to spread the virus to additional files, applications, and systems.

**#Polymorphic Viruses:**
More and more cybercriminals are depending on the polymorphic virus. It is a malware type which has the ability to change or mutate its underlying code without changing its basic functions or features. This helps the virus on a computer or network to evade detection from many antimalware and threat detection products.

Since virus removal programs depend on identifying signatures of malware, these viruses are carefully designed to escape detection and identification. When a security software detects a polymorphic virus, the virus modifies itself thereby, it is no longer detectable using the previous signature.

**#Resident Viruses:**
The Resident virus implants itself in the memory of a computer. Basically, the original virus program is not required to infect new files or applications. Even when the original virus is deleted, the version stored in memory can be activated. This happens when the computer OS loads certain applications or functions. The resident viruses are troublesome due to the reason they can run unnoticed by antivirus and antimalware software by hiding in the system’s RAM.

**#Rootkit Viruses:**
The rootkit virus is a malware type which secretly installs an illegal rootkit on an infected system. This opens the door for attackers and gives them full control of the system. The attacker will be able to fundamentally modify or disable functions and programs. Like other sophisticated viruses, the rootkit virus is also created to bypass antivirus software. The latest versions of major antivirus and antimalware programs include rootkit scanning.

**#System or Boot-record Infectors:**

The Boot-record Infectors infect executable code found in specific system areas on a disk. As the name implies, they attach to the USB thumb drives and DOS boot sector on diskettes or the Master Boot Record on hard disks. Boot viruses are no more common these days as the latest devices rely less on physical storage media.

1. ***Answer the following questions:***
	* + 1. What is virus?
			2. How does a computer get infected with a virus or spyware?
			3. Why do people create **viruses** and malware?
			4. What are the currently available antivirus programs?
			5. Does Windows come with a **virus** protection program?
			6. Is it a crime to make a computer virus?
2. ***Decide whether the following statements are true (Т) or false (F)***
3. Viruses cannot be spread through а computer network, only via floppies, transported from computer to computer.
4. The virus will spread as soon as you put the infected floppy in your PC.
5. The infector works by interfering in some way with the normal use of your computer.
6. The detonator in Lehigh works by altering what you see on your screen.
7. Most viruses spread through pirated games.
8. You should run an antivirus program every time you use your computer.
9. There are not very many viruses in circulation.
10. Virus shields are moreeffective than virus scanners.
11. ***Read the following words correctly and guess their meaning:***

to design, to implant, to generate, specific, function, technically, symptom, to identify, percentage, specifically, to compress, destructive

1. ***Read and translate the following word combination:***

technical terms, program code, specific purpose, executable file, to spread systematically, virus payload, incorrect information, directory information, system area, to launch a program specifically, write-protected disks, to infect software, to locate the documents, uninfected computer, network file system, to damage a program, to delete files, to reformat hard disk, legitimate program, data loss, system crush, specified conditions, host system, civilized programmed threat, anti-virus software, anti-spyware

1. ***Match the words and definitions listed below.***
2. а detonator a. а protective device
3. an infector b. to remove all traces of something
4. to boot c. а device used to set off an explosion or other destructive
5. to trigger d. to discover or recognize that something is present
6. to erase е. to set а process in motion
7. pirated f. something which transmits а disease or virus
8. а shield g. stolen, obtained without the owner's consent
9. to detect h. to load the operating system into memory

***8. Which word does not belong to the group?***

a) virus, worm, Trojan horse, bot, file, botnet;

b) distribute, download, automate, infect, view, execute;

c) duplicates, instructions, infects, invades, behaves, spreads;

d) spider, programmer, hacker, user, server, developer;

e) individual, general, normal, personal, analytical, digital.

***9. Fill in the blanks choosing from the variants given.***

1. Does the term computer virus refer to any malicious code that … (makes up/invades) a computer system? 2. When your computer executes an infected program it … (executes/deletes) the attached virus instructions. 3. A trigger event, such as a specific date, can … (kill/destroy/unleash) some viruses. 4. Love letter is one of the … (slowest/fastest) spreading mass-mailing worms of all time. 5. Hackers created viruses that insert themselves into … (used/unused) portions of a program file without changing its length.

***10. Transform the given sentences using the word(s) in brackets without any change in meaning.***

1. A computer virus is a set of programs that attaches itself to a file (connecting).

2. If a document contains an infected macro, the macro virus duplicates itself into the general macro pool, where it is picked up by other documents (doubles, selected).

3. A virus might deliver a payload which could be both harmless and devastating (do no harm, corrupt).

4. Software that can automate a task when commanded to do so is called an intelligent agent (is able, is instructed).

5. A trigger event, such as a specific date, can unleash some viruses (particular, release).

6. Trojan horses are notorious for stealing passwords using a keylogger – a type of program that records your keystrokes (known, a sort).

***11. Join parts of these sentences***

|  |  |
| --- | --- |
| 1. A virus as its name suggests….
2. The worm is ….
3. The Trojan horse is ….
4. The bomb is…..
5. A virus may be dealt with by means of….
6. A programmer secretly inserts a few….
7. Thus, the virus has spread to another disk….
8. Although viruses can be destructive…
9. The Ping-Pong virus ….
10. It is not easy to protect hard disks, so….
 | 1. many people use antivirus programs
2. some are quite benign
3. bounced a” ball” around your screen
4. is contagious
5. unauthorized instructions in a PC OS program.
6. a program intended to sabotage a computer
7. and the process can be repeated again
8. a program that covertly places illegal instructions in the middle of legitimate program
9. a vaccine, or antivirus, program that stops the spread of virus
10. a program that spreads by replicating itself
 |

* **WORD-STUDY**

***1W. Write the letter of the choice that is most nearly the opposite in meaning to the wordon the left.***

1. thorough

(A)blocked (B) gentle (C) famous (D) careless

1. to bewilder

(A)confuse (B) make clear to (C) curse (D) bless

1. legible

(A)not logical (B) slow (C) unclear (D) brief

1. to comprehend

(A)misunderstand (B) go alone (C) be alike (D) fail

1. frank

(A)dishonest (B) unknown (C) not reliable (D) unfriendly

1. earnest

(A)likable (B) insincere (C) unable to earn (D) messy

1. to dispose of

(A)keep (B) throw away (C) lose (D) find

1. to restore

(A)remember (B) destroy (C) shop (D) awaken

1. evident

(A)rare (B) hidden (C) wrong (D) everywhere

1. extravagant

(A)indoors (B) spending too much (C) thrifty (D) friendly

1. inferior

(A)outer (B) courageous (C) possible (D) better

1. to deceive

(A)build (B) tell the truth to (C) cheat (D) go up

***W2. Translate the sentences. Point out the Objective InfinitiveConstructions.***

1. Lady Byron considered computers to be basically stupid although they could seem clever. 2. We know the first computers to have represented a mass of vacuum tubes, transistors and integrated circuits. 3. Teachers expect the Centre of Education to provide them with information on programs for keeping students competitive in science and technology. 4. Businesspeople would like selling to be done anywhere via Web and other Internet resources. 5. We believe Hollerith to be the second giant after Babbage due to his "tabulating machine" to have completed the results of the 1890 US Census. 6. People involved in business know several cases of on-line fraud and computerbased espionage to have been committed. 7. Engineers know the speed of light to be the limiting speed on computers. 8. Do you know the Queen of Great Britain to become the first Head of State to use the global computer network.

***W3. Translate the sentences. Point out the Subjective Infinitive Constructions.***

1. The first thousand of the Net enthusiasts proved to be mainly academic and computer professionals. 2. Even the more sophisticated computational systems are unlikely to substitute the human brain. 3. CERN and MIT are known to be the first to turn towards Web development. 4. The Microsoft Corporation is considered to have become the world's biggest PC software provider. 5. The invention of microchips and new operating systems was expected to enable smaller and cheaper computers to perform difficult tasks faster. 6. The Web is stated to have created a standard that everybody could - and did - follow. 7. The boys enjoy, while looking NASA space flight transmission, to be informed what the astronauts are doing.

***W4. Choose a better synonym.***

Buffer overflow

A buffer overflow occurs/happens when a program or process tries to keep/store more data in a buffer (temporary data storage area) than it was intended to hold. Since buffers are created to contain a restricted/finite amount of data, the extra information - which has to go somewhere - can overflow into adjacent/bordering buffers, corrupting or overwriting the applicable/valid data held in them. Although it may occur accidentally/by mistake through programming error, buffer overflow is an increasingly common type of security attack on data reliability/integrity. In buffer overflow attacks, the extra data may contain codes designed to elicit/trigger specific actions, in effect sending new instructions to the attacked computer that could, for example, damage the user's files, change data, or disclose/release confidential information. Buffer overflow attacks are said to have arisen because the C programming language supplied the framework, and poor programming practices supplied the vulnerability/weakness. In July 2000, a vulnerability to buffer overflow attack was discovered in Microsoft Outlook and Outlook Express. A programming flaw made it possible for an attacker to compromise the integrity of the target computer by simply sending an e-mail message. Unlike the typical e-mail virus, users could not protect themselves by not opening stuck/attached files; in fact, the user did not even have to open the message to enable the attack. The programs' message header mechanisms had a shortcoming/defect that made it possible for senders to overflow the area with extraneous data, which allowed them to execute whatever type of code they desired on the recipient's computers. Because the process was activated as soon as the recipient downloaded the message from the server, this type of buffer overflow attack was very difficult to protect/defend. Microsoft has since created a patch to get rid of/eliminate the vulnerability.

* ***Additional texts***

*(Text 1)* **Types of viruses**

**1. Boot sector virus**

This type of virus can take control when you start — or boot — your computer. One way it can spread is by plugging an infected USB drive into your computer.

**2. Web scripting virus**

This type of virus exploits the code of web browsers and web pages. If you access such a web page, the virus can infect your computer.

**3. Browser hijacker**

This type of virus “hijacks” certain web browser functions, and you may be automatically directed to an unintended website.

**4. Resident virus**

This is a general term for any virus that inserts itself in a computer system’s memory. A resident virus can execute anytime when an operating system loads.

**5. Direct action virus**

This type of virus comes into action when you execute a file containing a virus. Otherwise, it remains dormant.

**6. Polymorphic virus**

A polymorphic virus changes its code each time an infected file is executed. It does this to evade antivirus programs.

**7. File infector virus**

This common virus inserts malicious code into executable files — files used to perform certain functions or operations on a system.

**8. Multipartite virus**

This kind of virus infects and spreads in multiple ways. It can infect both program files and system sectors.

**9. Macro virus**

Macro viruses are written in the same macro language used for software applications. Such viruses spread when you open an infected document, often through email attachments.

*(Text 2)* **Malicious Code Trends**

|  |  |  |
| --- | --- | --- |
| **Date** | **Threats** | **Trends** |
| 1981 | Cloner | The first known virus begins to spread. Cloner infects files on disks formatted for Apple II computers. The prevalence of disk-borne viruses continues well into the1990s with Jerusalem (1987), Michelangelo (1992), and others. |
| 1988 | Internet Worm  | The first major worm attack over the Internet sets the stage for today's prolific crop of mass-mailing worms. |
| 1998 | Back Orifice  | First Trojan horse designed to allow a remote hacker to gain unauthorized access to a computer. |
| 1999 | Melissa  | Macro viruses, such as Melissa and l.aroux, are ***prevalent*** for several years and cause trouble by infecting Microsoft Word and Excel files. |
| 2000 | Love Letter  | One of the fastest spreading mass-mailing worms. Followed by Sobig, Blaster, and MyDoom (2004). |
| 2001 | Code Red  | Worms designed for Denial of Service attacks gather steam. Code Red, which ***targeted*** the White House, is followed by Blaster (2001) and Slammer (2003). |
| 2002 | Klez | Klez is a mass-mailing worm that is particularly difficult to eradicate. Because the “From” address is spoofed, it is almost impossible to locate infectedcomputers. |
| 20Most notebook computers are equipped with several USB ports. 03  | Mimail | Social engineering takes center stage and users are confused by fake e-mails from seemingly legitimate companies, such as PayPal, Microsoft, and Wells Fargo. |
| 2004 | SasserNetskyXombeMyDoom, ZafiBagle | Worms, such as Sasser, begin to emerge that infect computers without user interaction, such as opening an infectede-mail attachment. Mass-mailing worms are still most prevalent. Worms that spread over instant messaging and handheld devices begin to emerge. |
| 2005 | MytobZotobRbot | Bots become one of the biggest security problems. Arriving as e-mail attachments, links embedded in e-mail messages, or from infected banner ads, bots install themselves on unprotected computers, which can then be controlled by unauthorized hackers and commandeered into botnets that launch spam and Denial of Service attacks. |

*(Text 3)* **Malware**

 Malware (for "malicious software") is any program or file that is harmful to a computer user. Thus, malware includes computer viruses, worms, Trojan horses, and also spyware, programming that gathers information about a computer user without permission.

**Adware**

Generically, adware (spelled all lower case) is any software application in which advertising banners are displayed while the program is running. The authors of these applications include additional code that delivers the ads, which can be viewed through pop-up windows or through a bar that appears on a computer screen. The justification for adware is that it helps recover programming development cost and helps to hold down the cost for the user. Adware has been criticized because it usually includes code that tracks a user's personal information and passes it on to third parties, without the user's authorization or knowledge. This practice has been dubbed spyware and has prompted an outcry from computer security and privacy advocates, including the Electronic Privacy Information Center. Noted privacy software expert Steve Gibson of Gibson Research explains: "Spyware is any software (that) employs a user's Internet connection in the background (the socalled 'backchannel') without their knowledge or explicit permission. Silent background use of an Internet 'backchannel' connection must be preceded by a complete and truthful disclosure of proposed backchannel usage, followed by the receipt of explicit, informed consent for such use. Any software communicating across the Internet absent of these elements is guilty of information theft and is properly and rightfully termed: Spyware." A number of software applications, including Ad-Aware and OptOut (by Gibson's company), are available as freeware to help computer users search for and remove suspected spyware programs.

AdWare is also a registered trademark that belongs to AdWare Systems, Inc. AdWare Systems builds accounting and media buying systems for the advertising industry and has no connection to pop-up advertising, spyware, or other invasive forms of online advertising.

**PUP**

A PUP (potentially unwanted program) is a program that may be unwanted, despite the possibility that users consented to download it. PUPs include spyware, adware, and dialers, and are often downloaded in conjunction with a program that the user wants. The term was created by McAfee, the Internet Security company, because marketing firms objected to having their products called "spyware": in the view of such firms, all the information necessary for informed consent is included in the download agreement. It is widely recognized, however, that many if not most users fail to read a download agreement in sufficient detail to understand exactly what they are downloading. McAfee differentiates PUPs from other types of malware, such as viruses, Trojans, and worms, which can be safely assumed to be unwanted by the user.

**Drive-by download**

A drive-by download is a program that is automatically downloaded to your computer, often without your consent or even your knowledge. Unlike a pop-up download, which asks for assent (albeit in a calculated manner likely to lead to a "yes"), a drive-by download is carried out invisibly to the user: it can be initiated by simply visiting a Web site or viewing an HTML e-mail message. Frequently, a drive-by download is installed along with another application. For example, a file sharing program might include downloads for a spyware program that tracks and reports user information for targeted marketing purposes, and an adware program that generates pop-up advertisements using that information. If your computer's security settings are lax, it may be possible for drive-by downloads to occur without any action on your part. Xupiter, an Internet Explorer toolbar program, is frequently installed as a drive-by download. The program is said to replace the user's home page, change browser settings, and use redirection to take all searches to the Xupiter Web site. In some versions, the program initiates drive-by downloads of other programs. Furthermore, although it comes with an uninstall utility, Xupiter is said to be next to impossible for the average computer user to remove. There are some arguments to be made in favor of drive-by downloads, particularly for downloads of patches or service packs that address security flaws. If these were automatically installed, instead of depending on the diligence of server administrators, computers and the Internet in general might be safer from malicious programming such as viruses and worms. In January 2003, a worm called the SQL Slammer exploited a known buffer overflow vulnerability in Microsoft SQL 2000 server systems to cause widespread Internet outages. The attack was launched precisely six months after Microsoft released a patch for the flaw. If the patch had been installed to vulnerable systems, the attack would have had little impact. However, although drive-by downloads for patches might address specific security flaws, they might also conflict with existing system configurations, and thus create more problems than they solve.

**Pop-up download**

A pop-up download (sometimes called a download pop-up) is a pop-up window that asks the user to download a program to their computer's hard drive. The window may feature a security warning, or some other type of message that is likely to lead to compliance. Often, the pop-up window has no information about the program to be downloaded, and may feature buttons for "download," "yes," or "ok" -- but none for "no" or "cancel." Faced with a pop-up download window, the user may think that the download in question is just a browser plug-in application needed for aspects of a Web site they're visiting, or that the pop-up window was generated by their own computer. Pop-up downloads often install programs that track online behavior and report it back to a parent company (spyware) and programs that use that information to generate specific pop-up advertisements (adware). EarthLink, a popular Internet service provider (ISP) recently estimated that 40 to 50 percent of their subscribers have such applications running on their computers, usually without the owner's knowledge. Subscribers contacting the ISP to report a problem are often surprised to find that these downloads are the cause. A less scrupulous variation of automatic installation, called a drive-by download, installs a program on a computer's hard drive without even first generating a pop-up window.

**Barnacle**

In a computer, a barnacle is unwanted programming, such as adware or spyware, that is downloaded and installed along with a user-requested program. Barnacles usually fall under the category of potentially unwanted programs (PUPs), a euphemistic term coined by McAfee to refer to programs that a user installs unintentionally, perhaps having unknowingly consented to their download. The term derives from the name of a crustacean that attaches itself to whales and boats, among other things. Like its marine counterpart, the computer barnacle can be difficult to eradicate. According to PC Mechanic, barnacles often use confusing uninstall wizards. Another tactic that a barnacle may use is to require the user to fill out an online form to uninstall. Because the host system is quite likely to be clogged with spyware, there may not be sufficient resources available to allow them to do so. Computer barnacles, like other spyware, can seriously affect computer performance. Unlike most spyware, however, they may also cause damage. Some barnacles interfere with the Winsock code that handles input/output requests for Internet applications in Windows operating systems. Winsock runs between a program (such as a browser) and the program that uses TCP/IP. Removal of this type of barnacle may corrupt Internet protocols and degrade network performance, in which case the user must reinstall the TCP/IP stack. The term barnacle is closely related to drive-by download, which is programming downloaded without user consent and often without the user's knowledge that any download has occurred.

**Cookie**

A cookie is information that a Web site puts on your hard disk so that it can remember something about you at a later time. (More technically, it is information for future use that is stored by the server on the client side of a client/server communication.) Typically, a cookie records your preferences when using a particular site. Using the Web's Hypertext Transfer Protocol (HTTP), each request for a Web page is independent of all other requests. For this reason, the Web page server has no memory of what pages it has sent to a user previously or anything about your previous visits. A cookie is a mechanism that allows the server to store its own information about a user on the user's own computer. You can view the cookies that have been stored on your hard disk (although the content stored in each cookie may not make much sense to you). The location of the cookies depends on the browser. Internet Explorer stores each cookie as a separate file under a Windows subdirectory. Netscape stores all cookies in a single cookies.txt fle. Opera stores them in a single cookies.dat file. Cookies are commonly used to rotate the banner ads that a site sends so that it doesn't keep sending the same ad as it sends you a succession of requested pages. They can also be used to customize pages for you based on your browser type or other information you may have provided the Web site. Web users must agree to let cookies be saved for them, but, in general, it helps Web sites to serve users better.

**Spyware**

Spyware is any technology that aids in gathering information about a person or organization without their knowledge. On the Internet (where it is sometimes called a spybot or tracking software), spyware is programming that is put in someone's computer to secretly gather information about the user and relay it to advertisers or other interested parties. Spyware can get in a computer as a software virus or as the result of installing a new program. Data collecting programs that are installed with the user's knowledge are not, properly speaking, spyware, if the user fully understands what data is being collected and with whom it is being shared. However, spyware is often installed without the user's consent, as a drive-by download, or as the result of clicking some option in a deceptive popup window. Software designed to serve advertising, known as adware, can usually be thought of as spyware as well because it almost invariably includes components for tracking and reporting user information. However, marketing firms object to having their products called "spyware." As a result, McAfee (the Internet security company) and others now refer to such applications as "potentially unwanted programs" (PUP). The cookie is a well-known mechanism for storing information about an Internet user on their own computer. If a Web site stores information about you in a cookie that you don't know about, the cookie can be considered a form of spyware. Spyware is part of an overall public concern about privacy on the Internet.

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