Ю. А. Лазуткіна

COMPUTERS AND PROGRAMMING

Ministry of Education and Science of Ukraine
Donbass state engineering academy (DSEA)

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COMPUTERS AND PROGRAMMING

(English)

TUTORIAL

for masters in computer specialties

Recommended by
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Ю. А. Лазуткіна

COMPUTERS AND PROGRAMMING

(Англійська мова)

Методичний посібник

для магістрантів комп'ютерних спеціальностей

Затверджено
на засіданні вченої ради
Протокол № 8_ від 18.11.2018

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В посібнику представлені фахові тексти та завдання для практичних занять із магістрантами комп'ютерних спеціальностей, які мають базовий рівень володіння англійською мовою. Посібник спрямований на удосконалення навичок читання, перекладу та обговорення іноземної професійної та науково-популярної літератури, придбання додаткових фахових знань, розширення професійного вокабуляру та формування професійної комунікативної компетенції магістрантів.

Посібник складається з 12 тематичних розділів, тематика і зміст яких відповідають навчальній програмі та задовольняють вимогам професійної підготовки сучасних ІТ-фахівців. Кожен розділ супроводжується вправами і завданнями на розуміння і засвоєння загального змісту прочитаного матеріалу, вивчення нової фахової лексіки, формування навичок ведення професійної дискусії та анотування іншомовної фахової літератури.

Робота з посібником сприятиме ознайомленню з різними аспектами мовленнєвої поведінки у професійному середовищі, формуванню у магістрантів лінгвістичної та фахової компетенції, допоможе сформувати навички використання англійської мови у професійній діяльності та підвищить їх інтерес до читання оригінальної літератури за професійним спрямуванням.

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CONTENT

Living with computers

I. Read and memorize the following words and word combinations:

remarkable	-	чудовий, видатний
to occur	-	відбуватися, траплятися, виникати
application	-	додаток, вживання
to define	-	визначати
to respond	-	відповідати
to execute	-	виконувати, здійснювати
to refer	-	відносити(ся), посилатися
to distinguish	-	розрізняти, характеризувати
with regard to	-	відносно
requirements	-	вимоги
mainstay	-	основа, кістяк
to hire	-	наймати
employee	-	співробітник, персонал
to benefit	-	отримувати вигоду, приносити користь
self-sufficiency	-	самостійність, самодостатність, самозабезпечення
to reduce	-	зменшувати, скорочувати, знижувати
to rely on	-	покладатися на …
to process	-	обробляти, переробляти
to access	-	отримати доступ
to carry out	-	виконувати
cashpoint	-	банкомат
to dispense	-	розподіляти
drafting machine	-	креслярський пристрій
complementary	-	додатковий
nuclei/ nucleus	-	ядра/ ядро
to shift	-	змінювати, змінюватися
exhausting	-	утомливий
assignment	-	завдання, призначення
via	-	за допомогою
capability	-	здатність, продуктивність
to possess	-	володіти
to develop	-	розробляти, розвивати
subsequent	-	подальший
to enhance	-	покращувати, підсилювати, збільшувати
to enable	-	дозволяти, уповноважувати
telecommuting	-	дистанційна робота
e-homework	-	електронна домашня робота

II. NOTES:

Computer-aided design (CAD)	-	автоматизоване проектування
Computer-aided manufacturing (CAM)	-	автоматизоване виробництво
Computerized axial tomography (CAT)	-	комп'ютерна томографія
Magnetic resonance imaging (MRI)	-	магнітно-резонансна томографія
Personal digital assistant (PDA)	-	персональний цифровий секретар
Interactive whiteboard	-	інтерактивна дошка

III. Read and translate the text.

Living with computers

The invention of the computer is one of the most remarkable innovations that have occurred over the last ten decades. Rarely does a day go by without a report in newspapers or on television of some new application of the computer. ***Computers*** are defined as programmable machines that have two key features: they respond to a specific set of instructions (given by the human) that have been well defined and they can execute a pre-recorded list of instructions usually referred to as a program. Now computers come in all types, sizes and shapes. They are also distinguished with regard to their manufacturer, features, memory size and a number of other feature. Nowadays, "Knowledge of computers" has become a basic requirement in job description. No matter what the professions, a mainstay of the companies prefers to hire employees who basically need to know how to operate computers.

Different sectors of our life have benefited from the use of computers. The business world uses computers for organization, self-sufficiency, reducing costs, increasing the speed of transactions and managing sales. Many companies rely exclusively on the computer for monitoring inventory and ordering, receiving, and paying for goods.

Financial institutions also make heavy use of computers to process and store many transactions each day. In banks computers store information about the money held by each customer and enable staff to access large databases and to carry out financial transactions at high speed. They also control the cashpoints, or ATMs (automatic teller machines), which dispense money to customers by the use of a PIN-protected card. People use a Chip and PIN card to pay for goods and services. With online banking, clients can easily pay bills and transfer money from the comfort of their homes.

Industries of all sizes and types are relying heavily on computers to help in product design and manufacturing processes and to control machines that build the products. Two areas in which the computer has improved productivity are computer-

aided design (CAD) and computer-aided manufacturing (CAM). In CAD, computers replace drafting machines, thereby speeding the design process; in CAM, microprocessors control various manufacturing processes.

Automated machines called robots are commonly used to reduce costs and defects while increasing safety in manufacturing tasks that are unsafe or boring. These robots are primarily microprocessor-controlled "arms" that can perform the same hot, dirty, or dangerous task—such as welding or painting automobile bodies—time after time without loss of concentration or reduction in efficiency.

Computers have created a revolution in the field of healthcare. Probably the best known computerized diagnostic tool is the computerized axial tomography (CAT) scan, which allows the doctor to visualize a cross section of the body part through a series of X- rays that are combined by the computer. Magnetic resonance imaging (MRI), a relatively new technique that is complementary to computerized axial tomography, relies on computer-visualized images of organs produced through the behavior of the nuclei of atoms in our bodies in a magnetic field.

In the academic world, teaching and learning has shifted from the manual and exhausting models of learning to the computerized versions. Today's education is about PowerPoint and e-homework assignments. The Internet on a computer is a storehouse of information. The computer is a boon to it. Young people who have grown up with PCs and mobile phones are often called the digital generation. Computers help students to perform mathematical operations and improve their maths skills. They are used to access the Internet, to do basic research and to communicate with other students around the world. Teachers use projectors and interactive whiteboards to give presentations and teach sciences, history or language courses. Students can also enroll for courses via the website and parents can download official report.

The multimedia capabilities possessed by computers make them ideal audio-visual media. They offer support to a variety of storage media like CDs, DVDs, laser disks, USB drivers. Computers today have digital senses as speech that enables them to communicate with human beings and other computers. Multimedia applications are being developed for various markets today, including, and perhaps most especially, the home.

Internet connection gives extra life to computers and people can do wonders with the help of it. We can do many activities just sitting at home with mere click of a button: E-banking, E-shopping, E-ticketing, E-mail, telecommuting, etc. Mobiles let you make voice calls, send texts, email people and download logos, ringtones or games. With a built-in camera you can send pictures and make video calls in face-to-face mode. New smartphones combine a telephone with web access, video, a games console, an MP3 player, a personal digital assistant (PDA) and a GPS navigation system, all in one. Internet users can find friends and partners, share their ideas through blogs, speak, see each other with the help of video chats and create business platforms to make money.

The invention of the computer and the subsequent technological developments that have been made to enhance their capabilities have been very significant to human beings. Ranging from entertainment to food production and life-saving issues it is hard to find activities that do not need the use of computers. However, some people have a strong belief that computers and IT technologies bring much stress in routine and make life more complicated. Nevertheless, it's hard to imagine our life without computers.

TEXT-BASED ASSIGNMENTS

IV. Find English equivalents to the following word expressions using the active vocabulary of the text.

Програмовані машини; набір інструкцій; виконувати інструкції; відризнятися за певним параметром; об'єм пам'яті; наймати співробітників; отримувати вигоду від використання комп'ютерів; покладатися на комп'ютери; активно застосовувати комп'ютери; керувати продажем; здійснювати фінансові операції; переводити гроші; дизайн продукту; покращувати продуктивність; автоматизовані машини; комп'ютерний дизайн; автоматизоване виробництво; комп'ютеризований діагностичний пристрій; інтерактивна дошка; надати презентацію; вдосконалювати навички; робити фундаментальні дослідження; завантажувати; робити голосові дзвінки; надіслати повідомлення електронною поштою; мультимедійні додатки; веб-доступ; персональний цифровий помічник; привносити багато стресу в життєвий розпорядок; ускладнювати життя.

V. Answer the questions to the text.

1. How has a computer changed our life?
2. What two main functions are performed by the computer?
3. In what criteria do modern computers differ from each other?
4. What is one of the main requirements of employment nowadays?
5. How does the usage of computers promote effective conducting of business?
6. How are computers used in banks?
7. Where are computers most actively used in industry?
8. What is the efficiency of the use of robots in production?
9. How can computers help in teaching and learning?
10. What computerized devices have made a revolution in the field of medicine?
11. What tendency dominates in the academic world now?
12. What features make computers ideal audio-visual media?
13. What kinds of activity have become possible online since the invention of the Internet?
14. Why do some people disapprove the prevalence of computers in our life?

15. What is your opinion about wide spreading of computers in our life? What positive or negative consequences of computerization do you consider?

VI. Give synonyms to the following words and word combinations and use them in the sentences of your own:

to come about; creation; to accomplish; to run (a computer); to appoint: a worker; to get profit; to count on; to diminish; to raise; to check; demands; to calculate; to alter; to facilitate; tiring; to connect; to intensify; capacity; recreation; to earn (money); to be associated; quickly.

VII. Match a word from the first part with two its synonyms from the second one.

1) innovations; remarkable; to define; unsafe; to develop; significant; to carry out; to offer; to enhance; to occur; to respond; to reduce; to increase; to store; to enable; to dispense;

2) to facilitate; to determine; modernization; dangerous; meaningful; to accomplish; to reinforce; to suggest; to appear; to lessen; to intensify; progress; outstanding; hazardous; to permit; to accumulate; to reply; to enlarge; to distribute; to happen; to diminish; to reserve; to invent; to propose; to fulfil; amazing; to interpret; to create; noteworthy; to allocate; to answer; to expand.

VIII. Give antonyms to the following words and word expressions and use them in the sentences of your own.

to dismiss;	to lose;	to increase;
to shrink;	to supply;	to inhibit;
with halt;	exposed;	to detain;
danger;	jolly;	to spend (money).

IX. Match the terms with their definitions.

TERMS	DEFINITIONS
Computer application	**1)**the usage of computer systems to aid in the creation, modification, analysis or optimization of a design.
Computer memory	**2)** a system that allows to communicate with your bank on the Internet.
Cashpoint (AIM)	**3)** an optical device that projects an image onto a surface, commonly a projection screen.

Online banking	**4)** a "constellation" of about 30 well-spaced satellites that orbit the Earth and make it possible for people with ground receivers to pinpoint their geographical location.
PDA (Persinal digital assistant)	**5)** a computer program, designed to perform a group of coordinated functions, tasks or activities for the benefit of the user, for example, a word processor, a media player, a photo editor.
Multimedia	**6)** a tool used in technical drawing, consisting of a pair of scales mounted to form a right angle on an articulated protractor head that allows an angular rotation.
Microprocessor	**7)** visualization of a cross section of the body part through a series of X- rays that are combined by the computer.
Interactive whiteboard	**8)** a device that is used to store data or programs on a temporary or permanent basis for use in an electronic digital computer.
Projector	**9)** a computer processor which incorporates the functions of a computer's CPU on a single integrated circuit or at most a few integrated circuits.
CAT	**10)** a machine that gives you money when you put a bank card into it.
Drafting machine	**11)** a radiology technique that uses magnetism, radio waves and a computer to produce images of body structure.
MRI	**12)** an interactive display in the format of a whiteboard that reacts to user input either directly or through other devices.
GPS (Global Positioning System)	**13)** content that uses a combination of different forms such as text, video, images, animation, interactive content.
CAD Software	**14)** a small, handheld mobile device that provides computing and information storage and retrieval capabilities for personal or business use, often for keeping schedules, calendars and address book.

X. Fill in the blanks choosing the appropriate words.

1. Computers accept information, … mathematical and/ or logical operations then supply new information.

a) calculate ***b) represent*** ***c) advance*** ***d) perform***

2. A computer is known for its surprising speed and … .

a) structure ***b) accuracy*** ***c) power*** ***d) simplicity***

3. If you want to change the photograph by means of a computer you should first … it.

a) digitize b) alter c) output d) transmit

4. Computers that process information in the form of numbers are called … computers.

a) analog b) digital c) multi-purpose d) special-purpose

5. A single microprocessor can do … work as a pioneer computer.

a) the same b) some c) more d) less

6. Information is given into the computer in the form of_____ .

a) ideas b) characters c) rules d) circuits

7. The basic function of a computer is_____ information.

a) to switch; b) to keep; c) to process d) to buy

8. The data needed for solving problems are kept in the _____ .

a) memory; b) input device; c) output device d) wire unit

9. A computer can carry out arithmetic-logical operations_____ .

a) leisurely; b) instantaneously; c) during some hours

10. Computers have become_____ in homes, offices, research institutes.

a) commonwealth; b) commonplace; c) common room

XI. Fill in each blank with the appropriate form of the words.

1. Operation, operate, operator, operational, operating.

A. A computer can perform mathematical … very quickly.

B. One of the first persons to note that the computer is malfunctioning is the computer … .

C. The job of a computer operator is to … the various machines in a computer installation.

D. The new machines in the computer installation are not yet … .

E. If a system is … , it is working.

2. Acceptance, accept, accepted, acceptable, acceptably.

A. A computer is a device which … instructions and gives out information.

B. The students are still waiting for their … into the Computer Science program.

C. It is … to work without a template if the flowcharts are not kept on file.

D. Mainframe host computers are not widely … in schools that are still using the single classroom, teacher/manager method of delivering information to students.

E. … logic programs have been studied extensively in the context of proving termination of Prolog programs.

3. Solution, solve, solvable, solver.

A. I may take a lot of time to find a … to a complex problem in programming.

B. A computer can … a problem faster than any human being.

C. A computer has often been referred to as a problem … .

D. Only the simplest differential equations are … by explicit formulas.

4. Remark, remarkable, remarkably, remarked.

A. Today's computers are … to be faster than their predecessors.
B. Systems analysts will often make …about existing programs so as to help make the operations more efficient.
C. There have been … developments in the field of computer science in the previous decade.
D. This is a unique device which Froebel most … invented.

5. Communication, communicate, communicable, communicative.

A. A computer must be able to … with the user.
B. Fiber optics is one of the developments in the field of … .
C. Some people working in computer installations aren't very … because they are shy.
D. Maynard (1997) claims that silence in Japanese is "a … device that can express many intentions and feelings".

XII. Fill in the gaps with prepositions if necessary.

1. Today computers can translate ___ and ___ foreign languages.
2. They operate ___ a great speed.
3. Computers process a large volume ___ data ___ a short period ___ time.
4. Thanks to the Internet, people can work, shop and bank ___ home.
5. A modern computer can do 500,000 sums ___ second.
6. In schools, pupils learn how to operate ___ a computer.
7. Data can be input into the computer ___ floppy disks or compact disks.
8. Computer keyboards are similar ___ typewriter keyboards.
9. The speed ___ this computer translation is one page ___ 40 seconds.
10. Every time I tried to feed the data ___ the computer, it gave me an error message.

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

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

XIV. Use words and collocations in the box to complete the sentences.

a) access the Internet b) do research c) make calls d) display data
e) store information f) carry out transactions g) financial

h) PDAs i) download j) digital generation k) PIN card
l) an interactive whiteboard m) built-in camera n) GPS

1. Thanks to Wi-Fi, it's now easy to _____ from cafes, hotels, parks and many other public places.
2. Online banking lets you _____ between your accounts easily and securely.
3. Skype is 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. We use _____ to give presentations at our conferences.
8. I have a _____ fitted in my car.
9. Bank managers use _____ software to make calculations and then generate graphs or charts.
10. I surf the Web every day and I often _____ files from the Net to my PC.
11. The wireless network at my university is great: we can connect our laptops, _____ and Wi-Fi cell phones to the network anywhere in the campus.
12. Nowadays _____ is used to pay for goods and services.
13. With a _____ you can make video calls in face-to-face mode.
14. People who have grown up with PCs and microchips are often called the _____.

XV. Fill in the blanks in the following text. Use one of the given words.

a) microcomputer b) accurately c) thinking d) data e) communicating
f) arithmetic j) output h) kinds i) coordinate j) software
k) technology l) refers m) process

Computers are electronic machines that (1) _____ information. They are capable of (2) _____ with the user, of doing different kinds of (3) _____ operations and of making three kinds of decisions. However, they are incapable of (4) _____. They accept (5) _____ and instructions as input, and after processing it they (6) _____ the results. When talking about computers, both hardware and (7) _____ need to be considered. The former refers to the actual machinery; where the latter (8) _____ to the programs which control and (9) _____ the activities of the hardware while processing data. The first computer was built in 1930 but since then computer (10) _____ has evolved a great deal. There are three different (11) _____ of computers in use today: the mainframe, the minicomputer and the (12) _____. These all have one thing in common: they operate quickly and (13) _____ in solving problems.

XVI. Choose the best adjective.

1.My laptop is only 3 centimeters ***(thick/ tall/ wide).*** 2. I can't use my mobile phone. The battery is ***(over/ flat/ exhausted).*** 3. The screen on my laptop isn't very ***(light/ white/ bright).*** 4. My video camera is very ***(easy to use/ uncomplicated/ obvious)***. 5. My new computer has a very ***(quick/ high speed/ fast)*** processor. 6. In three or four years, my new computer will probably be ***(old fashioned/ behind the times/ obsolete).*** 7. In our office we have a ***(wire-independent/ no wires/ wireless)*** network. 8. My new PDA is the ***(latest/ last/ most modern***) model. 9. I don't think this printer is ***(compatible/ connectable/ suitable)*** with my computer.

XVII. Form the necessary parts of speech from the words given in brackets to fill in the gaps.

Computers make the world smaller and smarter

The ability of tiny _____ ***(to compute)*** devices to control complex _____ ***(to operate)*** has _____ ***(transformation)*** the way many tasks are _____ ***(to perform),*** ranging from _____ ***(science)*** research to producing _____ ***(to consume)*** products. "Tiny computers on a chip" are used in medical equipment, home _____ ***(to apply),*** cars and toys. Workers use handheld _____ ***(to compute)*** devices to collect data at a customer site, to generate forms, to control inventory, and to serve as desktop _____ ***(to organize).*** Computers are part of many machines and devices that once required _____ ***(to continue)*** human _____ ***(to supervise)*** and control. Today, computers in _____ ***(to secure)*** systems result in safer environments, computers in cars improve energy _____ ***(efficient),*** and computers in phones provide features such as forwarding, call monitoring, and call answering.

Multimedia systems are known for their _____ ***(to educate)*** and _____ ***(to entertain)*** value, which we call 'edutainment'. Multimedia combines text with sound, video, animation, and graphics, which greatly enhances the _____ ***(to interact)*** between a user and a machine and can make _____ ***(to inform)*** more interesting and _____ ***(to appeal)*** to people. _____ ***(to connect)*** enables computers and software that might otherwise be incompatible to _____ ***(communication)*** and to _____ ***(to share)*** resources. Many people today telecommute – that is, use their computers to stay in touch with the office while they are working at home.

Distance learning and videoconferencing are concepts made possible with the use of an electronic classroom or boardroom _____ ***(to access)*** to people in remote _____ ***(to locate).*** The information superhighway is designed to significantly _____ ***(expansion)*** this interactive _____ ***(to connect)*** so that people all over the world will have free access to all these resources.

XVIII. Render the text into English.

В теперішній час люди не можуть навіть уявити свого життя без комп'ютерів. Комп'ютери стали настільки важливими, що ніщо не може замінити їх. З 1948 року, коли був створений перший комп'ютер, наше життя змінилось настільки, що це можна назвати «цифровою революцією». Комп'ютери можуть виконувати багато складних операцій одночасно. Збір даних ніколи не був таким легким, як зараз. Вчені фактично не можуть обійтись без них. Комп'ютери активно застосовуються на заводах для керування виробництвом. Завдяки їм сучасна медицина може діагностувати хвороби швидше і точніше. В фінансових закладах комп'ютери керують банкоматами, всі дані зберігаються на спеціальних жорстких дисках, а папір більше не застосовується в бухгалтерії. Крім того, архітектори, проектувальники та інженери також не можуть уявити своєї роботи без комп'ютерів. Вони також розповсюджені у освіті, адже можуть зберігати великий об'єм інформації, що допомагає студентам отримувати потрібну інформацію. Популярність комп'ютерів досягла такого розміру, що невміння користуватися ними наш час робить людину «безграмотною».

XIX. Make a list of the benefits computers have brought into your life. Compare it with those of your groupmates.

XX. Speaking. How do you think these professions might use computers? Share your opinion with other students.

A secretary, a bank manager, an architect, a doctor, a saleperson, a teacher, a businessman.

XXI. Make a short summary of the text "Living with computers".

How to write a summary

A summary is a brief statement of the main points of a piece of writing. A summary is not a rewrite of the original text and does not have to be long. The purpose of writing a summary is to give the basic ideas of the original reading. Here are the main hints of writing a good summary:

1. Identify the type of a work (an article, a text), its title, author and main points. Use the following phrases to render your mind: *the author presents his opinion…, the article deals with the problem…, the text discussing some problems related to…, the work provides information on …, etc.*

2. Write in the present tense: *at the beginning of the article the author characterizes…, explains …, comments on…, analyses; attention is drawn to the fact that …; it should be noted that… .*

3. Don't forget to use linking words so your reader can easily follow your thoughts: *next, further, then it was reported, in conclusion, at the end of the text and so on.*

4.Don't copy the article, paraphrase.

5. Don't put your own opinions or ideas into the summary.

6.The summary should have between 100 or 200 words.

TEXTS FOR ADDITIONAL READING

I. The importance of computers in medicine we all underestimate

Computers play a key role in almost every sphere of life. Owing to their intelligence and speed, computers function on a level close to that of the human brain. Right from efficient data storage and easy access and sharing of information, to conducting medical tests and simulating complex surgical procedures, computers have an important role to play in the medical field.

Data Storage. Computers are an excellent means for storage of patient-related data. Doctors often require information about a patient's family history, physical ailments in the family (if any), already diagnosed diseases and prescribed medicines. This information can be stored in a computer database. They can be used to store information about the medicines prescribed to a patient as well as those, which cannot be prescribed to him/her (ones which the patient is allergic to).

Surgical Procedures. Computer-assisted Surgery (CAS) is a fast-advancing field in medicine, which combines medical expertise with computer intelligence to give faster and more accurate results in surgical procedures. In CAS, a model of the patient is created, then analyzed prior to surgery. The surgical procedure is simulated on the virtual image of the patient. The surgery can also be performed by a surgical robot, as programmed by a medical professional, or the robot may only assist doctors while they do the actual surgery. In both cases, computer intelligence is at work.

Diagnostic Tests. Many of the modern methods of scanning and imaging are largely based on computer technology. Magnetic resonance imaging employs computer software. Computed tomography makes use of digital geometry processing techniques to obtain 3-D images. Sophisticated computers and infrared cameras are used for obtaining high-resolution images. Computers are widely used for the generation of 3-D images. Many of the modern-day medical equipment have small, programmed computers.

Knowledge Sharing. Computer technology eases the communication between medical practitioners and patients. Today, it is possible to obtain experts' opinions within seconds by means of the Internet. Medical practitioners can discuss medical issues in medical forums, they can blog, write articles, and contribute to medical journals available online. Besides, updates in the medical field, advancements in medicine, information about new methods of treatment, etc. can reach the common man within minutes, thanks to the Internet and easy access to computers.

The importance of computers cannot be stressed enough. Computers have given a new dimension to every field, and medicine is no exception.

II. Computer-aided manufacturing

Computer aided manufacturing (CAM) is a system of using computer technology to assist in the manufacturing process. This technology began to be developed in the 1950s, and by the 1970s, it was being used by some large manufacturers. By the early 21st century, computer aided manufacturing had become an integral part of the manufacturing process in many industries. Through the use of CAM, a factory can become highly automated, using systems such as real-time control and robotics. A CAM system usually seeks to control the production process through varying degrees of automation. These processes are carried out by various robotic tools, such as lathes, milling machines and welding machines. Each manufacturing process in a CAM system is controlled by computers, so a high degree of precision and consistency can be achieved that is not possible with machinery that must be controlled by people.

In computer aided manufacturing, computer software is used to create detailed, precise instructions. The software and machinery use numerical control (NC) applications that include precise measurements. As a result, the manufacturing process can be repeated over and over to the exact same specifications. Such precision is impossible with handheld or hand-controlled tools. This precision results in a higher quality and uniformity of parts and goods.

Some CAM systems provide additional automation by also keeping track of materials used and automating the ordering process from suppliers or the delivery process from the manufacturer's inventory. This helps ensure that enough materials are always available to keep the manufacturing process on schedule. CAM systems also can automate the process for requesting tool maintenance, repair or replacement.

Computer aided manufacturing is commonly linked to computer aided design (CAD) systems. The resulting integrated CAD/CAM system then takes the computer-generated design and feeds it directly into the manufacturing system. The design is then converted into multiple computer-controlled processes, such as drilling or turning.

One of the advantages of computer aided manufacturing is that it can be used to facilitate customization — the process of creating small batches of products that are

custom-designed to suit particular customers or clients. Without CAM and the CAD process that precedes it, customization would be a time-consuming, labor-intensive and costly process. Computer software, however, allows for easy customization and rapid design changes.

UNIT 2
From the history of computers

I.Read and memorize the following words and phrases.

bead frame	-	рамка з намистинками
slide rule	-	логарифмічна лінійка
logarithm tables	-	логарифмічні таблиці
mathematician	-	математик
calculus device	-	пристрій обчислення
to split	-	розділяти
arithmetic operations sequence	-	послідовність арифметичних операцій
The analytical engine	-	аналітична машина
increasingly	-	все частіше
vacuum tubes	-	вакуумні лампи
to aim	-	цілитися
responsible for	-	відповідальний за
circuitry	-	схеми
magnetic drums	-	магнітні барабани
iron-oxide	-	оксід заліза
to assign	-	призначити
circumference	-	окружність
adjacent	-	сусідні
tiny integrated circuits	-	мініатюрні інтегральні схеми
malfunction	-	несправність
predecessor	-	попередник
semiconductor	-	напівпроводник
to amplify	-	посилювати
microminiaturization	-	мікромініатюризація
rectangular	-	прямокутник
to etch	-	травувати, залишати слід, гравірувати
printouts	-	роздруківки
accessible	-	доступний

artificial intelligence	-	штучний інтелект
to fit onto a single chip	-	розміщуватися на одному чіпі
petroleum refinery	-	процес очищення нафти
threshold	-	поріг

NOTE:

acronym - an abbreviation formed from the initial letters of other words and pronounced as a word (e.g. ASCII, NASA).

II. Read and translate the text.

FROM THE HISTORY OF COMPUTERS

The very first calculating device used was the ten fingers of a man's hands. This, in fact, is why today we still count in tens. Then the abacus was invented, a bead frame in which the beads are moved from left to right. During the 17th and 18th centuries many people tried to find easy ways of calculating. J. Napier, a Scotsman, devised a mechanical way of multiplying and dividing, which is how the modern slide rule works. Henry Briggs used Napier's ideas to produce logarithm tables which all mathematicians use today.

The first real existing mechanical calculus device was "Pascaline", designed by prominent scientist Blez Pascal. It was 6- or 8-digital device for adding and subtracting numbers. In 1673 another 12-digital device was designed by Gotfrid Vilgelm Leibnits. It could instantly multiply and divide big numbers.

At the end of the 18th century Joseph Jakkard split calculation process into three stages: 1) to design the way of calculations, 2) to write a program as arithmetic operations sequence, 3) to make calculations according to the program. Englishman Charles Babbage used this innovation in his invention called "The Analytical Engine". The device consisted of 5 units, namely, arithmetic, storage, control, input and output, similar to first computers that appeared 100 years later.

A rapid computer science development and its scientific principles formation began in the 40-s of the 20th century. Each generation of computers is characterized by major technological development that fundamentally changed the way computers operate, resulting in increasingly smaller, cheaper, more powerful and more efficient and reliable devices.

The first generation (1930 – 1956): vacuum tubes.

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

the first electronic digital computer MACM was constructed by the Ukrainian Academician S. A. Lebedev in 1950. Such computers as BESM, Minsk, Ural, Razdan-3, M-20, M-220, Nairi-3, Strela, Dniepr were also created in our country.

The first computers used vacuum tubes for circuitry and magnetic drums. Drums are metal cylinders coated with magnetic iron-oxide material on which data and programs can be stored. The tracks on a magnetic drum are assigned to channels located around the circumference of the drum, forming adjacent circular bands that wind around the drum. A single drum can have up to 200 tracks. As the drum rotates at a speed of up to 3 000 rpm, the device's read/ write heads deposit magnetized spots on the drum during the write operation and sense these spots during the read operation. They were very expensive to operate and in addition to using a great deal of electricity, generated a lot of heat, which was often the cause of malfunctions.

The UNIVAC and ENIAC computers are examples of the first–generation computing devices. The UNIVAC is an example of these computers which could perform thousands of calculations per second. It was the first commercial computer delivered to a business client, the U.S. Census Bureau, in 1951. The ENIAC (acronym for Electronic Numerical Integrator and Computer), the world's first operational electronic digital computer, developed by Army Ordnance to compute World War II ballistic firing tables.

The second – generation (1956 – 1963): transistors.

In 1960s, the second generation of computers was developed and these could perform work ten times faster than their predecessors. The reason for this extra speed was the use of transistors instead of vacuum tubes. The transistor is a device composed of semiconductor material that amplifies a signal or opens or closes a circuit. Invented in 1947 at Bell Labs, transistors have become the key ingredient of all digital circuits, including computers. 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.

The third generation (1964 – 1971): integrated circuits.

The third-generation computers appeared on the market in 1965. These computers could do a million calculations a second, which is 1000 times as many as first generation computers. Unlike the second-generation computers, these are controlled by tiny integrated circuits and are consequently smaller. Transistors were miniaturized and placed on silicon chips, called semiconductors, which drastically increased the speed and efficiency of computers. A chip is a square or rectangular piece of silicon, usually from 1/10 to 1/4 inch, upon which several layers of an integrated circuit are etched or imprinted, after which the circuit is encapsulated in plastic or metal.

Instead of punched cards and printouts, users interacted with the third generation computers through keyboards and monitors and interfaced with an operating system, which allowed the device to run many different applications at one time with a central

program that monitored the memory. Computers for the first time became accessible to a mass audience because they were smaller and cheaper.

The fourth generation (1971 – present): microprocessors.

The fourth-generation computers have now arrived, and the integrated circuits have been greatly reduced in size. This is due to microminiaturization, which means that the circuits are much smaller than before. The fourth-generation computers are 50 times faster than the third-generation computers and can complete approximately 1,000,000 instructions per second.

The fifth generation – Present and beyond. Artificial Intelligence.

The fifth-generation computers are much faster. They are able to use artificial intelligence software. That is, the computer systems are able to "reason" and "learn" using data from their past actions. Such systems are still in development, though there are some applications used in financial management, petroleum refinery monitoring, diagnosing medical problems, providing vision systems for robots, and allowing people to use English to communicate with computers.

So, we are at the threshold of a new computer era, when artificial intelligence could be invented. There are no questions with "if", the only question is "when".

TEXT-BASED ASSIGNMENTS

III. Answer the following questions to the text:

1. What were the very first calculating devices in the history of mankind?
2. When did the first real calculating machine appear?
3. Who invented the so called "Analytical Engine"?
4. What was the first analog computer used for?
5. Who was responsible for the invention of the first digital computer?
6. What were the UNIAC and ENIAC created for?
7. What came out in 1950?
8. When was the second generation of computers developed?
9. What is the difference between computers of the first generation and the second one?
10. When did the third-generation computers appear?
11. What are the advantages of the third generation computers?
12. What are the advantages of the fourth-generation computers?
13. What process helped to reduce integrated circuits in size in the fourth-generation computers?
14. What do you know about the fifth generation of computers?
15. Where are the fifth-generation systems used at present?

IV. Give English equivalents to the words and collocations given below.

Самий перший обчислювальний пристрій; рахувати десятками; спосіб обчислення; логарифмічна лінійка; процес обчислення; розділити на етапи; послідовність арифметичних операцій; швидкий розвиток комп'ютерної науки; формування наукових принципів; покоління комп'ютерів; ефективні та надійні прилади; націлювати зброю; відповідальний за щось; дуже швидко; із швидкістю 3000 обертів за хвилину; виділяти багато тепла; причина несправності; виконувати тисячу операцій за хвилину; перевершити когось; енергоефективні; інтегровані схеми; з'явитися на ринку; запускати комп'ютерні додатки; напівпроводник; взаємодіяти з комп'юьером; стати доступним; зменшити у розмірі; штучний інтелект; бути в розробці; виконувати інструкції; фінансовий менеджмент; енергоефективний; перфоровані картки; взаємодіяти з операційною системою.

V. Give synonyms to the following words and use them in the sentences of your own.

apparatus	to compute	to employ
to part	model	to comprise
to direct	prompt	epoch
primarily	to generate	to set
substantial	to produce	failure
profitable	to convey	to strengthen
surely	achievable	outstanding
occure	effective	to accomplish
to store	round	ancestor

VI. Give antonyms to the following words and use them in the sentences of your own.

to disappear,	unknown,	with a delay,
to combine,	to discharge,	divergent,
to disappear,	slack,	to disconnect,
offspring,	cut-price,	retardation,
to weaken,	to forbid,	to intensify,
unavailable,	natural,	untrustworthy

VII. Match a word from the first part with its synonym from the second one.

1) to count	2) to try	3) to invent	4) branch
5) a great deal	6) to cut out	7) to provide	8) extra
9) tiny	10) to complete	11) single	12) dependable

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a) to devise	b) much	c) to supply	d) to finish
e) to attempt	f) to calculate	g) field	h) to exclude
i) reliable	j) additional	k) small	l) alone

VIII. Fill in the blanks in the following sentences.

1. During the same period in history, logarithm tables and calculus were …

a) invented b) developed c) made d) produced

2. While … machines are no longer commonly used, they remain curious as evidence of the growing role of numbers in modern life.

a) electric b) washing c) electronic d) calculating

3. Linear … circuits are used as audio-frequency (AF) and radio-frequency (RF) amplifiers.

a) wire b) opto-fiber c) integrated d) twisted

4. Vacuum tubes were replaced by … .

a) integrated circuits b) transistors c) chips d) computers

5. An instrument with … was invented for counting before a mechanical way for multiplying and dividing was devised.

a) circuits b) transistors c) vacuum tubes d) beads

6. Today's computer …can be put on a chip.

a) circuits b) components c) monitor d) software

7. Despite his failures to produce a fully functional … machine, Babbage remained steadfastly undeterred in pursuing his ideas.

a) washing b) distributing c) computing d) reading

8. Charles Babbage designed the Analytical Engine and it was this design that the basic … of the computers of today are based on.

a) framework b) motherboard c) chip d) gearbox

9. The invention of integrated circuit brought us the third generation of computers. With this invention computers became smaller, more powerful and more … .

a) interesting b) reliable c) intricate d) decorated

10. ENIAC was also the first machine to use more than 2,000 … , using nearly 18,000.

a) transistors b) drivers c) vacuum tubes d) chips

IX. Which term does a definition correspond to?

1. An ancient instrument for calculations.

a) a chip; b) an abacus; c) The Analytical Engine

2. A closed glass electron tube with no air in it, used for controlling a flow of electricity as in radio or TV.

a) a transistor; b) a vacuum tube; c) a cathode ray tube

3. A computing device operating by means of manipulating discrete binary digits (1s and 0s).

a) a digital computer b) an analogue computer c) a calculator

4. A small semiconductor which operates as an amplifier.

a) a chip; b) a transistor; c) a vacuum tube

5. Making things on a very small scale.

a) microminiaturization b) multiprogramming c) representation

6. A set of electronic circuits on one small flat piece (or "chip") of semiconductor material, normally silicon.

a) discrete circuits b) integrated circuits c) a transistor

7. A piece of stiff paper that can be used to contain digital information represented by the presence or absence of holes in predefined positions.

a) punched cards b) tabulating machines c) paper

8. A long, narrow device for calculating numbers with a middle part that slides backwards and forwards.

a) a slide rule b) a vacuum tube c) a chip

9. An early high-speed, direct access storage device that used a magnetic-coated cylinder with tracks around its circumference.

a) magnetic drums b) a microfloppy disk c) UNIVAC

10. Simulation of human intelligence processes by machines, especially computer systems.

a) cloud computing b) software engineering c) artificial intelligence

X. Fill in each blank with the appropriate form of the words.

1)Calculations, calculate, calculating, calculated, calculator, calculable.

A. A computer can do many kinds of … quickly and accurately.

B. According to experts' …, that star will explode within two billion years.

C. A computer can … numbers much faster than a manual …

D. Some problems aren't … without logarithm tables.

E. The key to being successful in the long run is taking … risks that minimize negatives and maximize positive outcomes.

2)Mechanic, mechanism, mechanical, mechanically, mechanistic, mechanics, mechanization, mechanized.

A. Today’s computers are less … than they used to be.

B. The … devices in a computer system operate more slowly than the electromagnetic devices.

C. The … of the brain is very … complicated but unlike a computer it isn't ….

D. A … approach provides students with a concise review of the essential concepts underpinning the subject.

E. … and automation is the use of machines wholly or partly to replace human labor.
F. … begins by quantifying motion, and then explaining it in terms of forces, energy and momentum.

3) Necessary, necessitate, necessarily, necessities, need.

A. Because it is expensive to set up a computer department it is … to budget well for the basic … of the installations.
B. A good programmer isn't … going to be a good systems analyst.
C. Students' lack of understanding of the basic concepts in computer science may …the instructor to restructure the course.
D. The size of the problem as well as the simulation time requirements … the use of large parallel computers.

4) Dependence, depend on, dependable, dependably, dependent, depending.

A. The length of time a programmer takes to make a program will vary … on the complexity of the program and his ability and experience.
B. One can always … a computer to obtain accurate answers because it's probably the most … machine in the world today.
C. … on computer is a good thing but in a limit.
D. But the addiction of computer use has made us too … to it.
E. Most customers don't care about being at the bleeding edge of technology and are happy if something simply works … .

5) Technology, technological, technologically, technologist.

A. Computer … is a fast growing discipline.
B. The …improvements of computers are reducing man's workload.
C. An engineering … is a professional trained in certain aspects of development and implementation of a respective area of technology.
D. … Advanced Aircraft (TAA) are light aircraft equipped with advanced equipment, including moving map displays, GPS, and autopilot systems.

XI. Match the terms with their definitions.

TERMS	DEFINITIONS
Abacus	1) a device that regulates current or voltage flow, acts as a switch or gate for electronic signals and consists of three layers of a semiconductor material.
Vacuum tube	2) making things on a very small scale.
Transistor	3) a circuit of transistors, resistors, and capacitors constructed on a single chip, in which the components are interconnected to perform a given function.

Calculator	4) an ancient instrument for calculations.
Chip	5) an electron tube that controls electric current between electrodes in an evacuated container.
Microminiaturization	6) device that performs arithmetic operations on numbers.
Multiprogramming	7) paper cards containing several punched holes that were punched by hand or machine to represent data.
Slide rule	8) was designed and built for the United States Army to calculate artillery firing tables.
UNIVAC	9) parallel processing in which several programs are run at the same time on a uniprocessor.
ENIAC	10) the capacity of a computer to perform operations analogous to learning and decision making in humans.
Punched cards	11) a ruler with a sliding central strip, marked with logarithmic scales and used for making rapid calculations, especially multiplication and division.
Integrated circuits	12) complex yet tiny modules that store computer memory or provide logic circuitry for microprocessors.
Artificial intelligence	13) a huge mainframe computer developed for the U.S. Census Bureau in 1950s.

XII. Match the words from two columns to create a phrase and use the phrase in the sentence of your own to speak about the history of computers.

computational	space
poor	data
perform	value
enter	flows of electricity
crucial	elimination of components
major	reliability
require	development
permit	command
switch	device
determine	advance

XIII. Complete the sentences using one of the given words. Put them into the necessary forms.

a) chip b) operate c) eliminate d) calculations e) advance
f) store g) determine h) enter i) subtract j) huge
k) artificial intelligence l) require m) reliability
n) vacuum tubes o) integrated circuit

1. The value of a digit in abacus … by the position of the pebbles on the wire.
2. Relays … by means of electromagnets.
3. Punched cards were used … data into the computer.
4. The first computers were very … , expensive and not available.
5. Machine language information … on magnetic drums.
6. With the help of abacus people can …, multiply and divide.
7. Integrated circuit technology … some discrete components and integrated the others on a single chip.
8. In the vacuum tubes resistors, inductors and capacitors … in order to make the whole system work.
9. The first generation computers were extremely large and had poor … .
10. They used … to control internal operations and required a lot of floor space.
11. The … constituted another major step in the growth of computer technology.
12. The third generation computers could do a million … a second.
13. The … was a crucial development in the accelerating pace of computer technology.
14. A major … in the development of computer technology was the creation of microprocessor and microcomputers.
15. The fifth-generation computers are based on VLSI (Very Large Scale Integration). Optical fibers, and … techniques are incorporated into them.

XIV. Fill in the blanks in the following text.

a) integrated circuits b) personal c) executed d) device e) software f) bulky g) core h) appliances i) fit in j) capacity k) versatile l) powered m) architecture n) semiconductor o) used p) calculator q) information r) implement

The Earlier versions of computers were huge and _____ and _____ up a whole room. The _____ EDSAC (Electronic Delay Storage Automatic Calculator) was one of the very first computers that could _____ the stored program _____ . In comparison to them, modern computers have tiny _____ and are much better in terms of _____ and speed as well as accuracy. The earlier versions of computers used _____ memory but today it has been replaced by the _____ memory. Today`s tinier version can even _____ your wrist watch and are _____ from the watch battery. _____ computers can be found in almost every house today and in various forms. They are in fact the icons of the _____ age.

What makes computers highly _____ and distinguishable from other _____ is that they can be programmed. A _____ can only calculate, just like a washing machine can only wash, but a computer can be programmed to do any kind of job. _____ programs are a list of instructions that can be stored and _____ by the computer.

XV. Form the necessary parts of speech from the words given in brackets to fill in the gaps.

A snapshot of computer development in the early 1950s would have to show a number of companies and laboratories in _____ ***(to compete)*** to ***(production)*** the few computers then _____ ***(to demand)*** for scientific research. Several computer- _____ ***(to build)*** projects had been launched immediately after the end of World War II in 1945, primarily in the United States and Britain. These projects were inspired chiefly by a 1946 document, "Preliminary _____ ***(to discuss)*** of the Logical Design of an Electronic Digital _____ ***(to compute)*** Instrument," produced by a group working under the _____ ***(to direct)*** of mathematician John von Neumann of the Institute for Advanced Study at Princeton University. The IAS paper, as von Neumann's document became _____ ***(to know),*** articulated the concept of the _____ ***(to store)*** program—a concept that has been called the single largest _____ ***(to innovate)*** in the history of the computer. Most computers _____ ***(to build)*** in the years following the paper's distribution were designed according to its plan, yet by 1950 there were still only a handful of _____ ***(to work)*** stored-program computers.

The actual use of computers was _____ ***(to restrict)*** to a small group of _____ ***(to train)*** experts, and there was _____ ***(to resist)*** to the idea that this group should be expanded by making the machines easier to use. Machine time was _____ ***(expense***), more expensive than the time of the mathematicians and scientists who needed to use the machines, and computers could _____ ***(processor)*** only one problem at a time. As a result, the machines were in a sense held in higher regard than the scientists. If a task could be done by a person, it was thought that the machine's time should not be wasted with it. The public's _____ ***(to percept)*** of computers was not positive either. If motion pictures of the time can be used as a guide, the _____ ***(popularity)*** image was of a room-filling brain attended by white-coated technicians, mysterious and somewhat _____ ***(to fright)*** about to eliminate jobs through _____ ***(automate).***

XVI. Choose the appropriate word among the words proposed in brackets.

People have very different goals _____ ***(with regard/ with overweight/ with discontent)*** to building AI (Artificial Intelligence) systems. For some, the goal is to build systems that think _____ ***(smoothly/ exactly/ continuously)*** the same way that people do. Others just want to get the job done and don't care if the _____ ***(transistor/ machinery/ computation)*** has anything to do with human _____ ***(thought/ entertainment/ health).*** And some are in-between, using human _____ ***(resting/ constructing/ reasoning)*** as a model that can inform and inspire but not as the final target for imitation.

The work aimed at genuinely _____ ***(simulating/ providing/ extending)*** human reasoning tends to be called "strong AI," in that any result can be used to not only build systems that think but also to _____ ***(explain/ hide/ intrude)*** how humans think as well. The work in the second camp, _____ ***(disposed/ aimed/ executed)*** at just getting systems to work, is usually called "weak AI" in that while we might be able to build systems that can_____ ***(behave/ swear/ plaster)*** like humans, the results will tell us nothing about how humans think. Somewhere in the middle of strong and weak AI is a third camp (the "in-between"): systems that are informed or _____ ***(discussed/ inspired/ received)*** by human reasoning. This tends to be where most of the more powerful work is happening today.

XVII. Translate into English:

1. Найпершим обчислювальним пристроєм були десять пальців рук людини. Тому ми сьогодні рахуємо десятками.
2. Потім винайшли рахівницю, рамку з кісточками, в якій кісточки рухались зліва направо.
3. Деякий тип рахівниці все ще використовується тому, що її можуть зрозуміти навіть ті, хто не вміє читати.
4. Це була спроба повністю замінити розумову діяльність людини.
5. В університеті Пенсільванії побудували перший цифровий комп'ютер на вакуумних лампах.
6. Учений висунув ідею збереження інструкцій для комп'ютера в його пам'яті.
7. Друге покоління комп'ютерів мало в десять разів більшу продуктивність ніж їх попередники.
8. Комп'ютери третього покоління управляються мініатюрними інтегральними схемами і, відповідно, вони менші за розмірами і більш надійні.
9. У комп'ютерів четвертого покоління на одному чипі розміщується 1000 схем.
10. На чипі напилюється чи вдруковується декілька слоїв інтегральної схеми, після чого схему герметично запаковують у пластикову чи металеву оболонку.

XVIII. Render in English.

Комп'ютерна техніка використовується для обчислень й опрацювання інформаційних об'єктів різного типу. Першим приладдям для лічби були, ймовірно, вузлики, лічильні палички. Розвиваючись, це приладдя ставало складнішим, і з часом з'явилися нові пристрої: абак (рахівниця), логарифмічна лінійка, електронний комп'ютер. Засоби для обчислень постійно змінювались і пройшли кілька етапів розвитку.

Обчислювальна техніка поступово стала використовуватися не лише для обчислень, а й для вирішення інших завдань, наприклад, для автоматизації

різних процесів, використання електронних засобів зв'язку, контролю обладнання, виконання офісних завдань, комп'ютерних ігор, навчання тощо. Кожна галузь, у свою чергу, запровадила додаткові вимоги до комп'ютерного обладнання, яке постійно розвивається відповідно до цих вимог.

Удосконалення комп'ютерів постійно відбувається в кількох напрямах. По-перше, змінюють або ж використовують нові основні елементи, з яких виготовляють комп'ютер, — змінюється елементна база комп'ютерів. По друге, змінюється програмне забезпечення. Крім того, вдосконалюються пристрої введення та виведення даних та організація і взаємозв'язок його окремих складових.

XIX. Render the text "HISTORY OF THE COMPUTER". Use some of the following phrases:

The title of the text is…;
The text is devoted to the problem of…;
The text deals with…;
This text is about…;
The extract centers round the problem of…;
It is clear from the text that…;
It further says that…;
One of the main problems to be singled out is…;
Great importance is also attached to;
It should be noted that …;
It must be mentioned that …;
In my opinion ...;
To my mind ...;
According to the text ...;
The problem described in the text is of great interest (importance) to…;
To sum it up …;
On the whole… .

XX. Find some additional information and facts about the computer development. You may use these sites:
http://www.pbs.org/nerds/timeline/
http://www.computerhistory.org/
http://www.computerhope.com/history/

TEXTS FOR ADDITIONAL READING

I. Charles Babbage (1791 – 1871)

Charles Babbage is a British mathematician and inventor, who designed and built mechanical computing machines on principles that anticipated the modern electronic computer. We honor him as "the father of the computer".

Charles was born in Teignmouth, Devonshire, and was educated at the University of Cambridge. Babbage was working on developing the Difference Engine and the Analytical Engine in the 1820s and 1830s respectively. These mechanical devices are considered the forerunners of the modern digital computer. Unfortunately, there was no way to build the machines with the 19th-century technology. Neither the Difference Engine nor the Analytical Engine was completed. Babbage's design was forgotten until his unpublished notebooks were discovered in 1937. In 1991, British scientists, following Babbage's detailed drawings and specifications, constructed the Difference Engine No.2. The machine works flawlessly, proving that Babbage's design was sound.

The inventor of that 19th-century computer was a very eccentric figure. Most mathematicians live personal lives not too much different from anyone else's. They just happen to do mathematics instead of driving trucks or running stores or filling teeth.

But Charles Babbage was the exception. For example, all his life, Babbage waged a campaign against London organ-grinders. He blamed them for the noise they made. Babbage was not satisfied with writing anti-organ-grinder letters to newspapers and members of Parliament. He personally hauled several organ-grinders before magistrates and became furious when the magistrates refused to throw them in jail.

Or consider this. Babbage took Tennyson's poem "Vision of Sin", which contained this couplet: “Every minute dies a man, Every minute one is born”. Babbage pointed out (correctly) that if this were true, the population of the earth would remain constant. In a letter to the poet, Babbage suggested another variant: “Every moment dies a man, And one and a sixteenth is born”. Babbage emphasized that one and a sixteenth was not exact, but he thought that it would be "good enough for poetry".

Yet, despite his eccentricities, Babbage was a genius. He was a prolific inventor. Babbage made notable contributions in different areas of science and technology. He reformed the postal system in England and compiled the first reliable actuarial tables. His inventions include the ophthalmoscope for examining the retina of the eye and the speedometer. Babbage's book “Economy of Machines and Manufactures” (1832) initiated the field of study known today as operational research – the science of how to carry out business and industrial operations as efficiently as possible. Babbage first suggested that the weather of past years could be read from tree rings. He also took a lifelong interest in skeleton keys, ciphers and mechanical dolls.

II. Augusta Ada King, Countess of Lovelace (1815-1852)

Even though the Analytical Engine was never constructed, a demonstration program for it was written. The author of that program has the honor of being the world's first computer programmer. Her name was Augusta Ada Byron, Countess of Lovelace.

She was the daughter of the 6th Lord Byron (the famous poet) and Annabella Byron, who legally separated two months after her birth. Her father then left Britain forever and his daughter never knew him personally.

Ada was a liberated woman at a time when this was not fashionable. In addition to her interest in foreign languages and music, she was also an excellent mathematician. The latter was very unusual for a young lady in the 19th century. (She was also fond of horseracing, which was even more unusual.) Ada's mathematical abilities became apparent when she was only 15. She studied mathematics with one of the most well known mathematicians of her time, Augustus de Morgan.

In 1833, she met the British mathematician and inventor Charles Babbage. At that time, he was working on the Difference Engine, a mechanical device designed to solve complicated mathematical problems. She became interested in Babbage's inventions.

In 1842, Lady Lovelace discovered a paper on the Analytical Engine that had been written in French by an Italian engineer. She translated the paper into English. At Babbage's suggestion, she added her own notes, which turned out to be twice as long as the paper itself. Much of what we know today about the Analytical Engine comes from Lady Lovelace's notes.

To demonstrate how the Analytical Engine would work, Lady Lovelace included in her notes a program for calculating a certain series of numbers that is of interest to mathematicians. This was the world's first computer program. "We may say more aptly", Lady Lovelace wrote, "that the Analytical Engine weaves algebraical patterns just as the Jacquard-loom weaves flowers and leaves." Most aptly said indeed!

The United States Department of Defense honored Ada Byron's achievements in the computer field in 1979, naming its high-level programming language, ADA, after her.

III. People who changed the computer world

The first computer-related company was founded in the Silicon Valley in northern California in 1955. That company attracted thousands of related businesses, and the area became known as the technological capital of the world. At the busiest times, five or more new companies were established in a single week. The Silicon Valley attracted many risk-takers and gave them an opportunity to work in an atmosphere of creativity.

Robert Noyce was a risk-taker who was successful both as an engineer and as a businessman. The son of an Iowa minister, he was informal and genuine. Even when he was running one of the most successful businesses in the Silicon Valley, he dressed informally and his office looked like everyone else's in the company. A graduate of the Massachusetts Institute of Technology, he started working for one of the first computer-related businesses in 1955. While working with these pioneers of computer engineering, he learned many things about computers and business management.

As an engineer, he co-invented the integrated circuit, which was the basis for later computer design. This integrated circuit was less than an eighth of an inch square but had the same power as a transistor unit that was over 15 inches square or a vacuum tube unit that was 6.5 feet square. As a businessman, Noyce co-founded Intel, one of the most successful companies in the Silicon Valley and the first company to introduce the microprocessor. The microprocessor chip became the heart of the computer, making it possible for a large computer system that once filled an entire room to be contained on a small chip that could be held in one's hand. The directors of Intel could not have anticipated the effects that the microprocessor would have on the world. It led to the invention of the personal computer and the birth of thousands of new businesses. Noyce's contributions to the development of the integrated circuit and the microprocessor earned him both wealth and fame before his death in 1990. In fact, many people consider his role to be one of the most significant in the Silicon Valley story.

The two men who first introduced the PC to the market – ***Steven Jobs*** and ***Stephen Wozniak*** – had neither prestigious university education nor experience in big business.

Jobs was raised by adoptive parents in Cupertino, California, located in what is now known as the Silicon Valley. Though he was interested in engineering, his passions of youth varied. He dropped out of Reed College, Portland, Oregon, took a job at Atari Corporation as a video game designer early in 1974, and saved enough money for a pilgrimage to India to experience Buddhism.

Back in the Silicon Valley in the autumn of 1974, Jobs reconnected with Stephen Wozniak, a former high school friend who was working for the Hewlett-Packard Company. When Wozniak told Jobs of his progress in designing his own computer circuit board, Jobs suggested that they go into business together, which they did after Hewlett-Packard formally turned down Wozniak's design in 1976. A prototype of the Apple I was built in the Jobs' family garage. The computer was actually a circuit board without monitor, keyboard, or casing.

Jobs and Wozniak brought different abilities to their business: To Wozniak the new machine was a gadget to share with other members of their computer club. To Jobs, however, it was a product with great marketing potential. Wozniak was the technological wizard, and Jobs was the entrepreneur.

From the very beginning, Apple Computer Co. founded by two friends had taken into consideration the needs and interests of the general public. Jobs insisted that the computers be light, trim, and made in muted colors. He also insisted that the language used with the computers be user-friendly and that the operation be simple enough for the average person to learn in a few minutes. These features helped convince the skeptical public that the computer was practical for the home and small business. The Apple I was offered at a price of $666.66 and sold 600 units, mainly to computer hobbyists. Their second model, the Apple II, contained a keyboard and a monitor. A cassette recorder as a means of storing programs was attached. The Apple II was the most used PC in home and small businesses from 1977 to 1982.

As the computer industry began to reach into homes and small busineses around the world, there arised the need for many new products for the PC. ***Martin Alpert***, the founder of Tecmar, Inc., was one of the first people to foresee this need. When IBM released its first PC in 1981, Alpert bought the first two models. He took them apart and worked 24 hours a day to find out how other products could be attached to them. After two weeks, he demonstrated the first peripheral devices for the IBM PC, and later became one of the most successful creators of personal computer peripherals.

His wife recognized the potential of his projects before he did, and enrolled in a graduate program in business management so she could run his electronics business successfully. Their annual sales reached $1 million, and they had 15 engineers working in their living room before they moved to a larger building in 1981. By 1984 Tecmar was valued at $150 million.

UNIT 3
Types of computers

I. Learn the following words and collocations.

capability	-	здатність, здібності
to penetrate	-	проникати, вторгатися
nuclear	-	ядерний
missile	-	ракета, ракетний, реактивний
to forecast	-	передбачати
curves	-	криві
continuous	-	безперервний, тривалий
discrete	-	дискретний, розрізнений
to depend on	-	залежати від …

intermediate	-	середній, допоміжний
to vary	-	змінюватися, відрізнятися
ability	-	здібності, здатність
to solve	-	вирішувати
complex	-	складний, комплексний, заплутаний
nano	-	нано
currently	-	в даний час, нині
expensive	-	дорогий, коштовний
installation	-	установка, встановлення, монтаж
to require	-	вимагати, потребувати
immense	-	величезний, невимірний
simulation	-	відтворення, симуляція, моделювання
fluid	-	рідина, рідкий, текучий
dynamic	-	динамічний, що розвивається
prospecting	-	розвідка, пошуки
defence	-	захист, оборона
to response	-	відповісти
request	-	запит, заявка, прохання
simultaneously	-	одночасно
concurrently	-	одночасно
moderate	-	помірний, невеликий, середній
resolution	-	резолюція, роздільна здатність
due to…	-	через
maintenance	-	технічне обслуговування
chassis	-	рама, корпус
wiring	-	проводка
constraint	-	обмеження
bulky	-	громіздкий
convenient	-	зручний, придатний
mainframe	–	«мейнфрейм», універсальная ЭОМ
to support	–	підтримувати, держати
lightweight	–	легкий, легковісний
memory capacity	–	об’єм пам’яті
hand-held device	–	ручний пристрій
palmtop	–	кишеньковий ПК

NOTE:

RAM - оперативна пам'ять, швидкодіюча пам'ять, призначена для запису, зберігання та читання інформації у процесі її обробки.

II.Read and translate the text.

Types of computers

Nowadays computers greatly increase man's thinking capabilities of planning, analyzing, computing and controlling. Hundreds of computers are already in daily use. They penetrate almost into all spheres of our modern society, from nuclear energy production and missile design to the processing of bank checks, weather forecasting, manufacturing, research and medical diagnoses.

There are three kinds of computers: digital, analogue and hybrid. ***An analogue computer*** computes by using physical analogue of numerical measurements, information is displayed in the form of curves. It is used to measure continuous physical quantity such as current flow, temperature, blood pressure, heart beats. Analogue computers are fast. ***A digital computer*** uses binary digits to display discrete information. It displays information in the form of text, graphics, and pictures. They are quite slow. ***A hybrid computer*** is able to understand binary as well as analog signal to display information. Information depends on the operating mode of computer. Hybrid computers are intermediate in speed.

Computers also vary widely in size, speed, and ability. Multi-user, multiprocessor large computer of very high efficiency and storing capacity is called supercomputer. It is able to solve very difficult and complex problem within a nano seconds. ***Supercomputer*** is a broad term for one of the fastest computers currently available. They are few in number because they are extremely expensive. Supercomputer users - mostly scientists and engineers at large scientific installations - sometimes run programs by means of long-distance telephone networks. This type of computers is employed for specialized applications that require immense amounts of mathematical calculations ("number crunching"), for example, weather forecasting, supercomputers scientific simulations, (animated) graphics, fluid dynamic calculations, nuclear energy research, electronic design, and analysis of geological data (e.g. in petrochemical prospecting). Perhaps the best known supercomputer manufacturer is Cray Research. Mr. Seymour Cray was a pioneer person in the field of supercomputer production. He had developed the first super computer Cray-1 in 1976.

Mainframe Computer is the most powerful multi-user computer used in large business organizations, departments of examination, industries and defense to process data of complex nature. It can response several hundred request very quickly. It uses several CPU for data processing. More than 100 users can use mainframe computer at a time because it works on time sharing mode. IBM built the first Mainframe Computer, System/ 360, in 1964. Nowadays a Mainframe is a very large and expensive computer capable of supporting hundreds, or even thousands, of users simultaneously. The chief difference between a supercomputer and a mainframe is that a supercomputer

channels all its power into executing a few programs as fast as possible, whereas a mainframe uses its power to execute many programs concurrently.

Minicomputer is a midsize computer. It is a multiprocessing system capable of supporting from up to 200 users simultaneously. It is often used in university, large business organizations, scientific research, engineering analysis, and industrial process monitoring and control to process complex data.

Workstation is a type of computer used for engineering applications (CAD/CAM), desktop publishing, software development, and other types of applications that require a moderate amount of computing power and relatively high quality graphics capabilities. Workstations generally come with a large, high-resolution graphics screen, at large amount of RAM, built-in network support, and a graphical user interface.

Nowadays mostly used computer is the ***microcomputer***. It is called Home PC or ***Personal computer (PC)*** because it is a single user computer. They are based on the microprocessor technology that enables manufacturers to put an entire CPU on one chip. A personal computer supports many high level languages, multimedia, graphics, 3D graphics and games. It is popular among students, professionals and home wives due to small size, low price, low maintenance cost and easy in operation. The Internet is popular due to PC and it is available for all income groups.

One of the first and most popular personal computers was the Apple II, introduced in 1977 by Apple Computer. Today, the world of personal computers is basically divided between Apple Macintoshes and PCs.

Actual personal computers can be generally classified by size and chassis/ case. The chassis or case is the metal frame that serves as the structural support for electronic components. Every computer system requires at least one chassis to house the circuit boards and wiring. There are two basic flavors of chassis designs–desktop models and tower models–but there are many variations on these two basic types. Desktop model is designed to fit comfortably on top of a desk, typically with the monitor sitting on top of the computer. Tower model is a computer in which the power supply, motherboard, and mass storage devices are stacked on top of each other in a cabinet. The main advantage of tower models is that there are fewer space constraints, which makes installation of additional storage devices easier.

Then come the ***portable computers*** that are computers small enough to carry. Notebook computers typically weigh less than 6 pounds and are small enough to fit easily in a briefcase. Notebook computers use a variety of techniques, known as flat-panel technologies, to produce a lightweight and non-bulky display screen. In terms of computing power, modern notebook computers are nearly equivalent to personal computers. They have the same CPUs, memory capacity, and disk drives. However, all this power in a small package is expensive. Notebook computers cost about twice as much as equivalent regular-sized computers. Hand-held computers are portable computers that are small enough to be held in one’s hand. Although extremely

convenient to carry, handheld computers have not replaced notebook computers because of their small keyboards and screens. Hand-held computers are also called PDAs, palmtops and pocket computers. Palmtops are small computers that literally fit in your palms. They are severely limited, but practical for certain functions such as phone books and calendars. PDA, short for personal digital assistant, a handheld device that combines computing, telephone/fax, and networking features.

TEXT-BASED ASSIGNMENTS

III. Answer the questions to the text.

1. What helps to enhance man's mental capacity nowadays?
2. What spheres of the usage of modern computers do you know?
3. What are the main types of computers?
4. What computing process is used in analogue computers?
5. What types of measurements is the analogue computer applied for?
6. What are the main features of the digital computer?
7. What types of signals is a hybrid computer able to process?
8. Why are so few supercomputers used at present?
9. Where are they mostly used?
10. What is the mainframe computer?
11. What mode does the mainframe computer work on?
12. What is the chief difference between a supercomputer and a mainframe?
13. What makes minicomputers different from other types of computers?
14. What type of computers is mostly used when high quality graphics capabilities are required?
15. What are the main characteristics of workstations?
16. What technology provides the placement of an entire CPU on one chip in personal computers?
17. Why are PCs so popular among students, professionals and house wives?
18. What personal computers are the leaders in the modern market?
19. What are the differences between a desktop model and a tower model of PCs?
20. What advantages and disadvantages of portable computers can you highlight?

IV. Decide whether the following statements are true or false by referring to the information in the text. Then make the necessary changes so that the false statements become true.

1. A minicomputer is a clone of a mainframe.
2. A hybrid computer can only accept analogue signals to output results.
3. Notebooks are as powerful as desktop computers.

4. Digital computers are the fastest ones.
5. Those who use PCs can be named time-sharing users.
6. Each PC is a part of some network.
7. A supercomputer is used for performing mathematical calculations.
8. Minicomputers are mostly used in high quality graphic applications.
9. A supercomputer is another name for the fastest mainframes.
10. Supercomputers are usually of the same price as personal computers.
11. Minicomputers can perform the same operations as mainframe.
12. Apple was one the first companies to produce a personal computer.
13. Tower models of personal computers are more suitable for the installation of additional storage devices.
14. Minicomputers are able to support up to 10 users simultaneously.
15. Personal computers support only low-level programming languages.

V.Give English equivalents to the word expressions given below.

Людські здібності в обчислюванні; в повсякденному використанні; проникати у всі сфери нашого життя; виробництво ядерної енергії; розробка ракет; прогноз погоди; фізичний аналог числових вимірювань; вимірювати постійну фізичну кількіст; кров'яний тиск; серцебиття; для відображення дискретної інформації; режим роботи комп'ютера; багатокористувацький комп'ютер; високі ефективність та ємність зберіганя; вирішувати складні завдання; доступний в даний час; віддалена телефонна мережа; вимагає величезної кількості розрахунків; “перемелювання чисел”; електронний дизайн; нафтохімічна розвідка; обробляти дані складного характеру; працювати в режимі спільного використання часу; виконувати багато програм одночасно; моніторинг промислових процесів; інженерні програми; екран високої роздільної здатності; вбудована підтримка мережі; комп'ютер для одного користувача; витрати на технічне обслуговування; легкість в експлуатації; баштові моделі комп'ютерів; настільні моделі комп'ютерів; просторові обмеження; джерело живлення; портативний комп'ютер; легко помістится в портфель; плоско-панельні технології; легкий і не громіздкий дисплей; коштувати вдвічі більше еквівалента; обчислювальна потужність; ручний комп'ютер; зручний щоб носити.

VI. Give synonyms to the following words using the active vocabulary of the text. Use them in your own sentences:

to enlarge, capacity, to calculate, to check, to infiltrate, dimension, creation, to exhibit, to foresee, exploration, rapid, to be competent, to count on, to alter, to react, appeal, accessible, complicated, high-priced, accessible, to engage, to necessitate, enormous, protection, to split, to assist, to accommodate**,** dissimilarity, keeping,

expenditure, constituent, conveniently, benefit, limits, fitting, compact, procedure, weightless, small, to substitute, to blend.

VII.Give antonyms to the given words. Use them in your own sentences:

incompetence, out-of-date, to reduce, consumption, to hide, rapid, incapable, inefficiency, manageable, unavailable, cheap, tiny, weak, assault, to oppose, to forbid, immovable, immense, impractical, to detach.

VIII.Match synonyms from two columns:

1. ability	a) memory
2. commonly	b) to control
3. group	c) quickly
4. storage	d) moment
5. to process	e) important
6. to connect	f) capability
7. essential	g) application
8. to refer (to)	h) generally
9. to obtain	i) field
10. usage	j) to arrange
11. instant	k) main
12. major	l) to consider
13. rapidly	m) to get
14. to range	n) to handle
15. to guide	o) to link

IX. Match the terms with their definitions.

TERMS	DEFINITIONS
Database	**1)**a group of computers connected by telephone lines or other communications cables.
Embedded computer	**2)** the central computer in a computer network.
Network	**3)** a body of information.
Minicomputer	**4)** a home computer which can be connected to the Internet.
Word processor	**5)** a dedicated computer used for typing and editing Documents.
Personal computer	**6)** a type of computer that possesses most of the features and capabilities of a large computer but is smaller in physical size.

Desktop computer	**7)** 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.
Server	**8)** 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.
Notebook	**9)** 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.
Tablet computer	**10)** a portable computing device featuring a touch-sensitive screen that can be used as a writing or drawing pad.
Handheld computer	**11)** one of the fastest computers in the world; can tackle complex tasks such as breaking codes, modeling worldwide weather systems and simulating nuclear explosions.
Workstation	**12)** 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.
Mainframe computer	**13)** a small lightweight personal computer that incorporates screen, keyboard, storage and processing components into a single portable unit, also referred to as a "laptop".
Supercomputer	**14)** a computer system that is part of a larger system and performs only peripheral functions (such as guidance or security) but no data processing function.

X. Look through the text again and say which type of computer do these descriptions refer to?

1) a hand-held computer which can be used as a telephone, a web explorer and a personal organizer;
2) a typical computer found in many businesses and popular for home use;
3) a large computer used for intensive data processing and often linked to many terminals;
4) a small computer that fits into items of clothing;
5) a portable computer that can be closed up like a briefcase, but it can be as powerful as a desktop PC;

6) a full-function PC, though it only weighs 1.2 kg – you can go to a meeting and write your notes on it, like a paper notepad;
7) its screen mode can be changed from portrait to landscape;
8) an ultra-portable computer that is even smaller than a traditional laptop. It is cheaper than almost any brand-new laptop you'll find at retail outlets, however, its internal components are less powerful than those in regular laptops.

XI. Choose the appropriate form of the words to complete the sentences.

1. Continuation, continue, continuing, continuously

A. If microcomputer sales … to increase, it won't be long before every household has one.
B. Computers can do repetitive operations … without getting bored.
C. There is a … interest in discovering new areas where computers can be used.
D. … is normally to the first character of the next non-comment line: A = 174.5 * Year & + Count / 100.

2. Measurement, measure, measured, measurable

A. The analog computer is essentially used for problems involving … .
B. Because computer equipment is often bulky, the area used for a computer installation must be … out carefully.
C. The number of employees a computer company has can be seen as a … of its success in the business world.
D. An outcome is a … and observable change in individuals, groups, organizations, systems, or communities.

3. Process, processing, processor, processed

A. All computers have an input, a …, an output and a storage device.
B. All information to be ... is prepared in such a way that the computer will understand it.
C. The basic concepts of data … are restricted to computers alone.
D. Computer expert reviews of … chips will guide you to the best new CPU for your needs and budget.

XII. Fill in the blanks in the following text. Use one of the given words:

a) digital b) memories c) calculations d) to perform e) mainframes f) analog g) process h) computer i) rapid j) general-purpose

Large computer systems, or _____ (1) are those computer systems which _____ (2) immense amounts of data. These powerful computers make use of very high-speed

_____ (3) into which data and programs are transferred for _____ (4) access. Whereas smaller computers may take several steps _____ (5) a particular operation, a larger _____ (6) may accomplish the same thing with one instruction. These components can be of two types: _____ (7) and analog. The digital computer or _____ (8) computer makes up about 90 per cent of the large computers now in use. The _____ (9) computer works something like a speedometer, in that it continuously works out _____ (10).

XIII. Choose the best word to complete the sentences.

1. A laptop computer with a screen you can write on is called ***(a tablet PC/ table PC/ flat screen PC).***
2. An image on TV or computer screen is made up of thousands of ***(points/ pixels/ bits).***
3. You can draw directly onto a computer screen with a ***(bright pen/ light pen/ pixel pen).***
4. A camera connected directly to the internet is called ***(an internet camera/ a webcam/ a web watcher).***
5. When you pay by credit card, your card is ***(swooped/ swiped/ swapped).***
6. A Palmtop or hand-held personal computer is small enough to hold in one hand and … ***(correspond/ operate/ enrich)*** with the other.
7. Palmtop or hand-held personal computer, lightweight, small, … (***battery-powered/ heated/ passing current),*** general-purpose programmable computer.
8. One of the most important features on my Palmtop is the … ***(built-in/ borrowed/ stolen)*** Database program.
9. Personal computers are based on the microprocessor … ***(removal/ technology/ maintenance)*** that enables manufacturers to put an entire CPU on one chip.
10. A digital computer uses … ***(binary/ ternary/ indivisible)*** digits to display discrete information.

XIV. Complete the following text with the words given below. Translate.

1. **a)** ***stylus*** ***b) wireless*** ***c) touch-screen***
d) hand-held ***e) handwriting recognition*** ***f) voice-recognition***

A typical PDA is a **…** device that runs on batteries and combines computing, phone and Net capabilities. For input you use a **…** or pen to write and make selections on a **…**; they also have buttons for launching programs. Some models have a small keyboard. They may have a **…** system that reacts to the user's voice. Most of them run on Windows Mobile. Palmtops supported by Palm Inc. use Palm OS. Pen-based system include **…**, so you write on the screen and the computer recognizes your handwriting

and inserts the appropriate letters. You can store personal information, take notes, draw diagrams and make calculations using PDAs. Many PDAs can access the Net via **…** technology.

2. a) display	***b) entertainment***	***c) replaceable***	***d) fit***
e) portable	***f) associated***	***g) lightweight***	***h) released***
i) emulate	***j) personal***	***k) compact***	***l) similarly***

A laptop computer, or simply laptop, is a **…** computer which usually weighs 4-8 pounds (2 to 4 kilograms), depending on **…** size, hardware, and other factors. A notebook is a personal computer that foregoes some functionality to remain **…** and small. Notebook computers typically weigh less than 5 pounds and are small enough - "notebook sized" - to **…** easily in a backpack or briefcase.

Initially, laptops were created to **…** the functionality of desktops, however, demand for laptops for **…** purposes has led to the development of more **…** devices, such as netbooks and tablets. Notebooks were also designed to function **…** to desktops, but were geared more toward **…** use than business use. The handy notebook size was what defined notebook computers. When they were first **…** they did not even have a **…** hard disk or other **…** peripherals.

XV. Replace the underlined words with their synonyms.

Palmtops are also called PDAs, hand-held computers and pocket computers. It typically has a ***miniaturized*** full-function, typewriter like keyboard for input and a small, full color, liquid-crystal display for output. In addition to an operating system that is ***compatible*** with that of a desktop computer, a palmtop will typically ***contain*** a word processor, a spreadsheet ***program***, and a calendar and phone book. A ***variety*** of other programs can be loaded and ***executed,*** and data can usually be ***transferred*** to and from a desktop computer. Although some palmtops are like personal digital ***assistants*** in that they ***accept*** handwritten or touch screen input, they generally ***differ*** in that the palmtop has more memory, a keyboard, and a greater variety of ***available*** programs.

Because of their small size, most palmtop computers do not ***include*** disk drives. However, many contain PCMCIA slots in which you can ***insert*** disk drives, modems, memory, and other ***devices***.

XVI. Form the necessary parts of speech from the words given in brackets to fill in the gaps.

PDA vs. Smartphones

A smartphone is a converged device that combines the … ***(to function)*** of a PDA and a cell phone. PDAs are often … ***(cheap)*** than a smartphone over the life of the

device. Many … ***(to carry)*** require you to purchase a wireless data plan for a smartphone along with a voice plan.

Smartphones …. ***(connection)*** to a cellular network, just like a cell phone. With a wireless data plan, smartphones can … ***(surfing)*** the Internet from anywhere a cellular signal is … ***(availability)*** (though speeds vary). PDAs do not connect to cellular networks and are thus unable to … ***(provision)*** the same range of connectivity to the Internet. PDAs and smartphones also use other forms of connectivity, … ***(to include)*** Wi-Fi and Bluetooth.

A PDA may offer a larger screen than some smartphones, which is very helpful for users who want to … ***(revision)*** spreadsheets or other documents without excess scrolling. Memory and processing power can also … ***(variation)*** among devices. PDAs and smartphones often use the same, or very … ***(similarity),*** operating systems. As a result, both types of devices can support third-party software programs that will increase the functionalities of your device.

XVII.Read the computer AD and then answer the following questions:

1.What is the memory size of this PC?
2. Which input devices are supplied?
3. What is the size of the monitor?
4. How fast is the processor?
5. What is the capacity of the hard drive?
6. Which operating system does it use?
7. What multimedia features does the computer have?

• Intel Pentium IV 1.7GHz Processor • Mini Tower Chassis
• 256Mb Rambus RDRAM • 60GB Hard drive
• Embedded Intel 3D Direct AGP video with 64MB SDRAM
• 64-voice wavetable sound • 48 X CD-ROM Drive
• 19″ (17.9″ VIS) Colour SVGA monitor • Microsoft Windows XP
• 1.44Mb 3.5″ Floppy Drive • Microsoft Intellimouse • 105-key keyboard

XVIII. Translate into the English language.

I. Стаціонарний комп'ютер — це звичайний комп’ютер, який має такі складові: системний блок, монітор, миша, клавіатура, звукові колонки. Стаціонарний — означає непереносний, який стоїть на одному місці. Зазвичай такі комп’ютери більші та потужніші за інші типи персональних комп’ютерів.

Портативні — означає переносні. Портативні комп’ютери — це легкі мобільні ПК з тонким екраном. На відміну від настільних ПК, портативні

комп’ютери поєднують ЦП, екран і клавіатуру в одному корпусі і можуть працювати від батареї.

Існує багато типів переносних комп’ютерів, і їх по-різному класифікують. ***Ноутбук*** — портативний персональний комп’ютер, у корпусі якого об’єднані типові компоненти ПК, включаючи дисплей, клавіатуру і вказівний пристрій (звичайно сенсорна панель або тачпад), а також акумуляторні батареї. Ноутбуки відрізняються невеликими розмірами і вагою, час автономної роботи ноутбуків варіюється в межах кількох годин. ***Нетбуки*** відрізняються малими габаритами і вагою. Однак маленький розмір екрана знижує зручність роботи з таким пристроєм. Нетбуки орієнтовані на перегляд веб-сторінок, роботу з електронною поштою та офісними програмами. ***Планшетні комп'ютери*** — клас комп’ютерів, обладнаних планшетним пристроєм рукописного введення, об’єднаним з екраном. Планшетний комп’ютер дозволяє працювати за допомогою спеціального пера, стилуса або пальців без використання клавіатури і миші.

ІІ. Ноутбук чи нетбук?

З кожним роком все більше людей купують портативні комп’ютери. Сучасні ноутбуки досягли такого рівня розвитку, що можуть стати повноцінною заміною стаціонарного комп’ютера. Нетбуки досить недавно з’явилися на ринку комп’ютерів. Проте вже встигли завоювати популярність серед користувачів.

Основні характеристики нетбуків:

- невелика ціна,
- невеликі габарити,
- мала вага,
- тривалий час автономної роботи,
- маленький екран,
- низька продуктивність комп’ютера.

Нетбук це, як правило, дуже компактний пристрій розміром з книгу. Нетбуки дозволяють користувачеві переглядати інтернет-сторінки, користуватися програмами для онлайн спілкування, редагувати текстові документи і працювати з іншими не вимогливими до продуктивності додатками.

Ноутбуки зараз це повноцінні комп’ютери. Вони мають таку ж продуктивність, як і звичайні настільні комп’ютери.

Основні характеристики ноутбуків:

- висока продуктивність,
- великий екран,
- наявність великої кількості різноманітних портів і виходів,
- велика вага,
- як правило, невеликий час роботи від акумулятору,

- наявність приводу компакт-дисков.

Отже, якщо вам потрібен легкий комп'ютер, який можна без проблем завжди носити з собою, то ваш вибір нетбук. Якщо вам необхідна висока продуктивність, то нетбук вже не підійде, вам необхідно купувати ноутбук.

XIX. Speak about benefits and limitations of PDAs.
XX. Explain how laptops can be beneficial to business people.
XXI. Write down three examples of how tablet PCs can be used in the classroom.
XXII. What is an ideal computer for you?

TEXTS FOR ADDITIONAL READING

I. Quantum computers

The key features of an ordinary computer—bits, registers, logic gates, algorithms, and so on—have analogous features in a quantum computer. Instead of bits, a quantum computer has quantum bits or qubits, which work in a particularly intriguing way. Where a bit can store either a zero or a 1, a qubit can store a zero, a one, both zero and one, or an infinite number of values in between—and be in multiple states (store multiple values) at the same time! A gentler way to think of the numbers qubits store is through the physics concept of superposition (where two waves add to make a third one that contains both of the originals). Qubits use superposition to represent multiple states (multiple numeric values) simultaneously in a similar way. Just as a quantum computer can store multiple numbers at once, so it can process them simultaneously. Instead of working in serial (doing a series of things one at a time in a sequence), it can work in parallel (doing multiple things at the same time).

In reality, qubits would have to be stored by atoms, ions (atoms with too many or too few electrons) or even smaller things such as electrons and photons (energy packets), so a quantum computer would be almost like a table-top version of the kind of particle physics experiments they do at Fermilab or CERN! Now you wouldn't be racing particles round giant loops and smashing them together, but you would need mechanisms for containing atoms, ions, or subatomic particles, for putting them into certain states (so you can store information), knocking them into other states (so you can make them process information), and figuring out what their states are after particular operations have been performed.

Although people often assume that quantum computers must automatically be better than conventional ones, that's by no means certain. So far, just about the only thing we know for certain that a quantum computer could do better than a normal one is factorisation: finding two unknown prime numbers that, when multiplied together, give a third, known number. In 1994, while working at Bell Laboratories,

mathematician Peter Shor demonstrated an algorithm that a quantum computer could follow to find the "prime factors" of a large number, which would speed up the problem enormously. Shor's algorithm really excited interest in quantum computing because virtually every modern computer (and every secure, online shopping and banking website) uses public-key encryption technology based on the virtual impossibility of finding prime factors quickly (it is, in other words, essentially an "intractable" computer problem). If quantum computers could indeed factor large numbers quickly, today's online security could be rendered obsolete at a stroke.

Does that mean quantum computers are better than conventional ones? Not exactly. Apart from Shor's algorithm, and a search method called Grover's algorithm, hardly any other algorithms have been discovered that would be better performed by quantum methods. Given enough time and computing power, conventional computers should still be able to solve any problem that quantum computers could solve, eventually. In other words, it remains to be proven that quantum computers are generally superior to conventional ones, especially given the difficulties of actually building them. Who knows how conventional computers might advance in the next 50 years, potentially making the idea of quantum computers irrelevant—and even absurd.

II. Rugged portable computers

Mobile rugged computers provide support in areas where it would be impractical to haul a computer, separate monitor, keyboard, and mouse. A portable rugged computer – known commonly as a lunchbox computer, portable workstation or luggable computer, is designed to do just that. These rugged portable computers offer the same functionality of a desktop or portable computer, with the advantage of all necessary peripherals, multiple hard drives, card slots and displays built in.

Various levels of ruggedness are available from rugged industrial to military-grade including a fully sealed fanless version.

Whether you require a military grade server or standalone rugged PC, all systems utilize military-grade high MTBF components and complete revision control for assured multi-year program availability. Systems are available as COTS off the shelf solutions or 100% customized configurations to meet your rigorous requirements. Each system incorporates aircraft grade aluminum to provide the lowest weight, but also to provide the optimum ruggedness to support naval, airborne and ground based applications. All computers are designed and built in the USA for the highest assured quality.

There are also rugged portable computer systems, among which are Rugged Military LCD Displays, Rugged Storage Arrays, Keyboards and total rack and transit case System Integration.

III. A desktop or a tower computer?

Desktop and tower computers are two different styles of computer case that use desk space in varying ways. Desktop computers are designed to lay flat on the desk, while towers stand upright. Most modern computers use one of three sizes of tower case. Home Theater PC or server computer cases often use a desktop configuration, though, according to Newegg.com's computer case buying guide.

Tower computers sit upright, providing interior access through side panels.

Mini-Tower

The smallest type of tower computer case is the mini-tower. This type of case typically measures less than 14 inches in height and is designed to conserve desk space. Although the small size of this type of case makes them convenient for users with limited desk space, the size limitations of the case often limit the upgrade potential of mini-tower computers. Most mini-tower cases only support one to two internal drive bays, severely limiting their data storage capacity. Mini-tower computers are often restricted to using less powerful low-profile expansion due to the limited space within the case. These space limitations often make mini-tower computers difficult to work on and significantly reduce their cooling capacity compared to larger cases with similar equipment.

Mid-Tower

Mid-tower computers are the most common full-sized desktop computer. This size of case provides a balance between interior space, expandability and desktop foot print. These cases are typically between 16 and 20 inches in height and up to 19 inches in length. This type of case provides significantly better cooling than most mini tower cases and usually supports up to seven drive bays. Mid tower cases are also large enough to support full size expansion cards and a larger number of case fans than mini tower cases. While mini-tower computers typically only support one or two case fans, mid tower computers usually support from two to four fans.

Full-Tower

The largest type of case used in home computers is the full tower. This type of case can span up to three feet in height and often support up to fifteen internal and external drive bays. Full tower cases have spacious interiors providing superior air circulation and work space. Full-tower computers often support up to six case fans including models with a 120 or 240 millimeter diameter.

Desktop

Desktop computers are very similar to tower computers in respect to their layout. The major difference between the two is that the drive bays are turned 90 degrees so that they are oriented parallel to the surface of the desk. Desktop cases are typically equivalent in size to a mid-tower computer turned on its side. This type of case covers substantially more desktop space than a tower computer and is sometimes reinforced so that a monitor can sit on top of it to conserve space. Desktop cases usually have less cooling efficiency than mid or full tower cases since they mount fewer fans.

UNIT 4
External hardware

I. Study the following words and expressions:

to enhance	-	покращувати
jamming	-	перешкоджання
editing keypad	-	клавіатура для редагування
layout	-	компонування, розташування, схема,
to utilize	-	використовувати
thumb keyboard	-	клавіатура для великих пальців
pointer	-	покажчик, стрілка, навідник
trackball	-	«трекбол», шаровий маніпулятор
trackpad	-	трекпад
to roll over	-	перевернути
to bounce off	-	відскакувати
clipboard	-	буфер обміну
printout	-	роздруківка, вивід на друк
hard copy	-	копія документа, друкована копія
to convert	-	перетворювати, трансформувати
print spooler	-	блок поперпедньої підкачки данных для друку, «спулер»
dot-matrix printer	-	матричний принтер
pin	-	контактний стрижень
impact printing	-	контактний друк
print head	-	друкуюча головка
photocopier	-	фото (світло) копіювальний апарат
electrostatic charge	-	електростатичний розряд
ink-jet	-	струменевий друк, струменевий принтер
bubble-jet printer	-	бульбашково-струменевий принтер
to capture	-	фіксувати (зображення)
flatbed	-	планшетного типу
film scanner	-	скануючий пристрій зчитування з плівки
resolution	-	роздільна здатність
hand-held scanner	-	ручний сканер
dpi (=dots per inch)	-	точок на дюйм
flash memory card	-	флеш-карта пам'яті
VDU (Visual Display Unit)	-	пристрій візуального зображення
CRT screen (Cathode Ray Tube)	-	екран дисплея (електроннопроменева трубка)
electron gun	-	електронна гармата, інжектор електронів

phosphor	-	люмінофор (речовина для покриття екрану ТБ)
to flicker	-	мерехтіння, блимання
to emit radiation	-	випромінювати радіацію
clarity	-	ясність, прозорість, чистота
energy consuming	-	енергоємний

II. Read and translate the text.

External hardware

Computer Hardware is the physical part of a computer, as distinguished from the computer software that executes or runs on the hardware. Computer hardware is divided into external and internal hardware. The terms “external” or “peripherals” describe hardware devices that are installed outside of the computer to enhance its functionality. Popular peripheral devices include a keyboard, a mouse, a printer, a digital camera, a scanner, a joystick and some others.

A keyboard allows the user to key in programs and data and to control the computer system. The design of most computer keyboards is based on the typewriter’s QWERTY layout (these are the first six letters on the top left of the keyboard), which was engineered to keep the typewriter’s mechanical keys from jamming. In addition to the basic typing keypad, computer keyboards include a collection of function keys designed for computer-specific tasks, a calculator-style numeric keypad, and an editing keypad with keys such as End, Home, and Page Up. There are still people who use the DVORAK layout, on which all vowels and punctuation marks are placed on the left and consonants on the right.

A laptop keyboard is different from a desktop keyboard to help reduce the size and the overall weight of the laptop. Today’s smartphones and tablets do not come with a physical keyboard utilizing a thumb keyboard or on-screen keyboard to type.

A pointing device allows you to manipulate an on-screen pointer and other screen-based graphical controls. The most popular pointing devices for personal computers include mice, trackballs, pointing sticks, trackpads, and joysticks. A standard desktop computer includes a mouse.

A mouse, a primary pointing device of the computer, includes one or more buttons that can be “clicked” to input command selections. To rack its position, a computer mouse uses one of two technologies: mechanical or optical. A mechanical mouse reads its position based on the movement of a ball that rolls over a mouse pad placed on a desk. An optical mouse uses an onboard chip to track a light beam as it bounces off a surface, such as a desk, clipboard, or mouse pad. An optical mouse provides more precise tracking, greater durability, less maintenance, and more flexibility to use the mouse on a wide variety of surfaces without a mouse pad.

A printer is a device that prints your texts or graphics on paper. The output on paper is called printout or hard copy. A program in your computer, called the printer driver, converts data into a form that your printer can understand. A print spooler stores files to be printed when the printer is ready.

Printers can be of different types. ***A dot-matrix*** printer uses a group, or matrix, of pins to create precise dots. A print head containing tiny pins strikes an inked ribbon to make letters and graphics. This impact printing technology allows to print multi-part forms such as receipts and invoices, so it's useful when self-copying paper is needed. It has two important disadvantages: noise and relatively low resolution (from 72 to 180 dpi).

An ink-jet (also called bubble-jet) printer generates an image by spraying tiny, precise drops of ink onto the paper. A standard ink-jet has a three-colour cartridge, plus a black cartridge. Some professional printers can print in wide format, ranging from 60 cm up to 5 metres (e.g. for printing advertising graphics).

A laser printer uses a laser beam to fix the ink to the paper. A laser works like a photocopier; a powder called toner is attracted to paper by an electrostatic charge and then fused on by a hot roller. Laser printers are fast and produce a high resolution of 1,200 to 2,400 dpi, so they are ideal for businesses and for proofing professional graphics work. Laser use a page description language or PDL which describes how to print the text and draw the images on the page. The best-known languages are Adobe PostScript and HP.

Input devices such as ***scanners*** and ***cameras*** allow you to capture and copy images into a computer. A scanner reads images and converts them into electronic codes which can be understood by a computer. There are different types of scanners: a flatbed (can capture text, colour images and even small 3D objects and is used on a desktop); a film scanner (is used to scan film negatives or 35 mm slide); a hand-held scanner (ideal to capture small pictures and logos).

A digital camera doesn't use film. Photos are stored as digital data (bits made up of 1s and 0s), usually on a tiny storage device known as a flash memory card. You can connect the camera or memory card to a PC and then alter the images using a program like Adobe Photoshop, or you can view the images on a TV set.

Digital video camera and webcams let you send and receive live video pictures through the Internet. They can be used to record photos and video onto disk. The resolution of webcams is expressed in megapixels (million pixels).

Most desktop computers use a separate monitor or VDU (visual display unit) as ***a display device***, whereas notebook computers use a flat panel LCD screen (liquid crystal display screen) attached to the system unit. Inside the computer, there is a video card which processes images and sends signal to the monitor.

The Cathode Ray Tube of a monitor is similar to a traditional TV set. It has three electron guns (one for each primary colour: red, green and blue) that strike the inside of the screen, which is coated with substances called phosphors, which glow and create

colours. CRTs are cheap, but they are heavy, can flicker and emit radiation. A Liquid Crystal Display is made from flat plates with a liquid crystal solution between them. The crystals block the light in different quantities to create the image. The advantages of LCD monitors (or "flat panel displays") include display clarity, low radiation emission, portability, and compactness. Image quality is a factor of screen size, dot pitch, width of viewing angle, refresh rate, resolution, and color depth. Plasma screen technology creates an on-screen image by illuminating miniature colored fluorescent light a rrayed in a panel-like screen. The name "plasma" comes from the type of gas that fills fluorescent lights and gives them their luminescence. Like LCD screens, plasma screens are compact, lightweight, and more expensive than CRT monitors. They are rather energy consuming, too.

TEXT-BASED ASSIGNMENTS

III.Answer the following questions to the text.

1. Give the definition of the term "computer hardware".
2. What subdivisions does computer hardware consist of?
3. What devices are used to get data into a computer?
4. What is the function of a computer keyboard?
5. What types of computer keyboards do you know?
6. What does a pointing device do?
7. What are the most popular pointing devices at present?
8. In what parameters does a mechanical mouse differ from an optical mouse?
9. What computer components take part in converting data into printed forms?
10. What printer technologies are most popular with personal computer users?
11. How does a dot-matrix printer work?
12. What processes lie in the basis of the ink-jet printer's functioning?
13. What is the basis of printing with the help of a laser printer?
14. What are scanners used for?
15. What types of modern scanners do you know?
16. What are cameras used for?
17. How does a digital camera store data?
18. How do digital video cameras and webcams expand our capabilities when using the Internet?
19. What types of computer displays are common now?
20. What are the main characteristics of LCD and plasma screens?

IV.Give English equivalents to the words and word expressions given below using the active vocabulary of the text.

Периферійні прилади; підвищувати функціональність; вводити програми; утримувати від заїдання; калькуляторний стиль цифрової клавіатури; зменшити розмір та вагу ноутбука; використовувати пальцеву або екранну клавіатуру для текстового набору; вказівний пристрій; маніпулювати екранним вказівником; екранний графічний контроль; натискати кнопки; змінювати позицію (комп'ютерної миши); відстежувати світловий промінь; буфер обміну; килимок для миші; забезпечувати більшу довговічність; надрукувати на папірі; друкована копія; матричний принтер; технологія ударного друку; рахунки-фактури; квитанції; самокопіюючий папір; струменевий принтер; генерувати зображення; лазерний принтер; електростатичний заряд; трансформувати в електронний код; планшетний сканер; плівковий сканер; ручний сканер; флеш-карта пам'яті; змінювати зображення; переглядати зображення на телевізорі; відправляти відеоролики в реальному часі через Інтернет; записувати відео на диск; мерехтіти та виділяти випромінювання; чіткість дисплея; розмір крапки; ширина кута огляду; частота оновлення; глибина кольору; енергоємні.

V. Give synonyms to the following words using the active vocabulary of the text:

outer, appliance, to position, to intensify, widespread, to enable, to govern, to be created, to prevent, to be located, to diminish, all-embracing, to use, to direct, to trace, to leap, covering, to equip, accurate, adaptability, to accumulate, effect, helpful, drawback, to form, to captivate, confirmation, to modify, to observe, picture, to acquire, to convey, analogous, to gleam, to sparkle, to radiate, clearness, to brighten, diminutive.

VI. Give antonyms to the following words:

internal, software, to decrease, to forbid, to expose to sth, to omit, to lessen, to remove, inexact, input, huge, ineffective, gain, amateur, slow-moving, to consume, to free, disconnect, to fix, to deliver, unfastened, different, innovative, to fade, costly, light, solid, obscurity, bulky.

VII. Decide if the sentences are true or false. Correct the false sentences. Translate.

1. Scanner is used to play computer games.
2. Microphone is used to copy images from paper into a computer.
3. Light pen is used to draw pictures or select menu options directly on the screen.
4. Digital camera is used to input voice commands and dictate text.
5. Mouse is used to select text and click on links on web pages.
6. The details detected by a scanner are not determined by its resolution.

7. Video editing software allows you to manipulate video clips on the computer.
8. A digital camera uses a light sensitive film instead of a memory card for storing the images.
9. A dot-matrix printer has a relatively low resolution.
10. An ink-jet printer can work as a scanner, a fax and a photocopier as well as a printer.
11. A laser printer is used in computerized design, 3-D technical illustrations etc.
12. Active-matrix LCDs use TFT technology.
13. The size of the screen is measured horizontally.
14. Before you can use a new printer, you have to install the driver from a CD ROM.
15. When a print job has started, it can't be cancelled.

VIII.Give the terms to the following definitions:

1) the key which produces upper-case letters, but it doesn't affect numbers and symbols;
2) the key which removes the character to the left of the cursor or any selected text;
3) to press and release the mouse button;
4) a stationary device that works like a mouse turned upside down. You roll it with your hand to move the pointer on the screen;
6) it is used to send live video images via the Internet;
7) a container that holds the ink in an ink-jet printer;
8) powdered ink used in laser printers;
10) small needles that press on the inked ribbon to make the characters on paper;
11) a language that tells a printer how to print a document;
12) a monitor similar to a traditional TV set;
13) the viewing area which is measured diagonally;
14) the number of colours a monitor can display;
15) this monitor is ideal for photographic work and video games.

IX.Complete the sentences with the words in the box. Translate.

a) touchpad b) barcode c) dpi d) input e) flatbed f) Enter/Return
g) touch screens h) flash i) film j) home cinema k) cartridge l) print spooler
m) printer n) print heads o) LCD screen p) resolution
q) print driver r) laser printer s) via

1. … key is used to confirm commands; in a word processor, it creates a new paragraph.
2. A … is found on notebook PCs. You use it by pressing the sensitive pad with a finger.

3. Interactive … are used in museums, information centres and Internet kiosks. You use your finger to point directly to objects on the screen.
4. It has become one of the life's most familiar sounds – the beep of the supermarket cash desk whenever a … is scanned.
5. Scanners and cameras are … devices used to transfer images into a format that can be understood by computers.
6. Most digital cameras use … memory cards to store photos.
7. … scanners have a flat surface and take at least A4-sized documents.
8. To scan photographic negatives or slides you will need a … scanner.
9. This scanner has a … of 300x600.
10. When the ink runs out, you have to change the …
11. …. is a flat-panel display which works by emitting light through special liquid.
12. The printer is connected to the computer … a USB cable.
13. If you intend to set up a … , consider getting a very big screen, a DVD recorder and a good set of speakers.
14. With an appropriate software you can view the images on a computer, manipulate them, or send them to a … and produce excellent quality colour copies.
15. If there's a problem with the print quality, perhaps the … need cleaning.
16. A … is a utility that organizes and arranges any document waiting to be printed.
17. In computers, a … is a program installed to control a particular type of printer.
18. The differences in … are noticeable: the more dots per inch, the clearer the image.
19. A … uses a laser beam to fix the ink to the paper.

X.Make three-word expressions combining words from three lists: A, B and C. Then match each expression with the appropriate phrase.

A:	***central***	***B:***	***circuit***	***C:***	***disk***
	liquid		***video***		***network***
	hard		***processing***		***drive***
	main		***crystal***		***unit***
	digital		***area***		***display***
	local		***disk***		***board***

1. This computer network is located within a limited geographical area such as a small business or a university lab.
2. The part of a computer that controls all the other parts of the system.
3. An electronic device that is used to display information in many calculators and portable computers.
4. A central flat card used as a base on which electronic components are placed and then connected together by wires.
5. … are widely used for storing and viewing movies and other data.

6. A disk drive that passes data to or from the hard disk and the computer.

XI. Fill in the missing words choosing from the variants given below.

a) pointer b) viewing angle c) pixel d) mouse
e) resolution f) scanner g) surface
h) allows i) pitches j) dot matrix k) display

1. A keyboard … the user to key in programs and data and to control the computer system.
2. An optical mouse uses an onboard chip to track a light beam as it bounces off a …, such as a desk, clipboard, or mouse pad.
3. Some … screens, can be classified as both input and output devices.
4. Greater … densities and smaller dot … yield sharper images of higher resolution.
5. A wide … indicates that you can view the screen from various positions without compromising image quality.
6. Printer … is measured by the number of dots printed per linear inch.
7. While laptops, touch-screen phones/tablets, and other similar devices don't require a … , they all use the same concept to communicate with the device.
8. The term … printer is used for impact printers that use a matrix of small pins to transfer ink to the page.
9. People with restricted movement can use very small motions to move the … a long distance on the screen.
10. An optical … is a hardware input device that optically "reads" an image and converts it into a digital signal.

XII. Choose the required word to complete each sentence.

1. Press this button to switch on the___.
   A. keyboard ***C. floppy disk***
   B. system unit ***D. control unit***
2. A ___ is an obligatory part of any personal computer.
   A. speaker ***C. printer***
   B. programmer ***D. keyboard***
3. A computer ___ is made up of a large number of dots called pixels.
   A. screen ***C. peripheral***
   B. user ***D. software***
4. A mouse is a mechanical or optical ___ unit.
   A. pointing ***C. control***
   B. storage ***D. transforming***

5. The ideal position for the ___ is on the same plan as the keyboard and as close to the keyboard as possible.

A. monitor ***C. disk drive***

B. central processing unit ***D. mouse***

6. The future of high-quality printing in businesses belongs to ___.

A. ink-jet printers ***C. laser printers***

B. computer typists ***D. typewriters***

7. Peripherals include ___.

A. central processor ***C. input and output units***

B. main memory ***D. scroll wheel***

8. A ____ can send live pictures from wherever it's sited to another location by means of the internet.

A. transmitter ***C. digital camera***

B. mouse ***D. antenna***

9. Color … are more expensive to operate since they use two ink cartridges.

A. printers ***C. lasers***

B. prints ***D. ribbons***

10. A computer scanner is an … device because it takes information from the real world (e.g., a document or picture) and converts it into digital information for a computer to store or manipulate it.

A. output ***C. input***

B. computational ***D. mechanical***

XIII. Match the beginnings of the sentences in the first part with their endings in the second one.

I.

1. In addition to the basic typing keypad, computer keyboards include a collection of function keys
2. A pointing device allows you
3. A recurring cost of using a printer is the ink-jet or laser cartridge
4. An optical mouse provides more precise tracking, less maintenance, and more flexibility
5. As data moves along the expansion bus,
6. A CRT (cathode ray tube) display is a device
7. Once the connection is made,
8. You have to use the expansion bus
9. If you want to install a peripheral device
10. If it does not,
11. If the right type of port is not available,
12. PnP is a feature that allows the computer
13. The cable you use

II.

a) it can travel through expansion slots, cards, ports, and cables.
b) to use the mouse on a wide variety of surfaces without a mouse pad.
c) designed for computer-specific tasks.
d) to manipulate an on-screen pointer and other screen-based graphical controls.
e) that offers an inexpensive and dependable way of output.
f) that must be replaced every few thousand pages of output.
a) you'll probably have to install driver software.
b) must match the peripheral device and a port on the computer.
c) to recognize just any peripheral device automatically
d) PnP will recognize the new device.
e) you need PnP.
f) you might have to add an expansion card.
g) to make a connection between the system board and a peripheral device.

XIV.Fill in the blanks in the sentences with the necessary words. All the letters of the words are given below.

DOAEDSBKR, TRNVOEC, TIIGDLA, WOLLA, ULOOESRNTI, EANEACINNTM, EANALMPIUT, DEEFHRRES.

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

XV.Match the terms in the box with the appropriate explanation or definition below.

a) software b) scanner c) peripheral devices d) monitor e) laser printers f) floppy disk g) hardware h) input i) port j) digital camera k) output l) central processing unit

1. The brain of the computer.
2. Physical parts that make up a computer system.
3. Programs which can be used on a particular computer system.
4. The information which is presented to the computer.
5. Results produced by a computer.

6. Hardware equipment attached to the CPU.
7. Visual display unit.
8. Small device used to store information. Same as ‘diskette’.
9. Any socket or channel in a computer system into which an input/output device may be connected.
10. It may be used to convert a printed picture, drawing, or document into a digital file which can be edited on a computer.
11. It records and stores photographic images in digital form.
12. Because they do not use ink, they have less image smearing problems than inkjet printers and are able to print pages faster.

XVI.

a) Complete this customer review from a website by typing in the words from the box.

a) perform b) data c) word processor d) online e) download f) digital g) built-in h) store i) personal j) monitor

4 of 4 people found the following review helpful!!!

12 Feb 2008

I bought a new Mac Book Pro last month, and I’ve been very happy with it so far. The Intel Core 2 Duo processor is a real bonus, allowing the computer to _____ (1) tasks faster than earlier Mac Book models; the 160GB hard drive is large enough to _____ (2) all of my music, photos and videos; and I didn’t even need to buy an external _____ (3) – the widescreen 17″ display is easy to look at, even for long periods of time.

Another great feature is the _____ (4) i-Sight camera; it can be used for web chats, to make video podcasts, or even just to take _____ (5) photos. Software updates are easy, too: if you’re _____ (6) – just surfing the Web or checking email – and an update becomes available, a box appears asking if you want to _____ (7) the update. You just click OK, and it’s done. You don’t even have to worry about security either. Every time you transmit _____ (8) from your computer on the Internet, Apple’s Safari web browser protects your _____ (9) information, such as bank details and credit card numbers, using a firewall. The only criticism you have is the lack of a good _____ (10), such as Microsoft Word.

b) Complete this review of a digital camcorder by typing in the nouns and adjectives from the box.

addition(al); process(or); play(er); optimize(d); control(ler); power(ful)

The DF201 benefits from a (1) _____ optical zoom lens and a video image (2) _____ designed for High Definition (HD) recording. Features include a “Quick Start” button and an intuitive menu system, easily navigated using a joystick (3) _____. The camcorder is (4)_____ for high-resolution true widescreen recording and offers (5) _____ features such as a 2.7” LCD and a 0.27” 16:9 colour EVF (Electronic Viewfinder), which allow users to compose and play back video in the same dimensions that it will be displayed on a widescreen TV set. It is then a simple process to finalize the DVD in-camera before playing it back in a compatible home DVD (6) _____.

XVII.Choose the correct forms of the words in brackets to fill in the gaps.

VGA (Video Graphics Array) was introduced in 1987 and was a standard that allows graphics to _____ ***(to display)*** on your monitor. It _____ ***(to limit)*** to only 256 colors and an on-screen _____ ***(to resolute)*** of 640 x 480 dots (or pixels). Most people tend to use higher standards such as Super-VGA.

Many games require very _____ ***(to advance***) graphics cards (boards) _____ ***(to install)*** within your computer to make them run. These advanced graphics cards contain their own CPU that is _____ ***(to dedicate)*** purely to displaying the _____ ***(graphical)*** on your screen. You should find that a recent PC has this advanced graphics _____ ***(capable)*** built-in whereas PCs from only 2-3 years ago may not!

Computer presentation projection devices – These are projection devices that can ____ ***(to attach)*** to your computer and are useful for displaying _____ ***(to present)*** to a group of people. They are best used in _____ ***(to combine)*** with presentation programs, such as Microsoft PowerPoint. They are used within _____ ***(to educate)*** and are also very popular for sales presentations.

Different types of printers – There are many different types of printers. In large organizations, laser printers are most commonly used because they can print very fast and give a very high quality output. In most organizations, the printers _____ ***(to connect)*** to the computers via a network. This means that each person with a computer does not require his or her own printer. Each computer connected to the network can print using a particular _____ ***(to share)*** printer.

XVIII.Translate into English.

I. ***Клавіатура*** - це стандартний клавішний пристрій введення, призначений для введення алфавітно-цифрових даних та команд керування. Комбінація монітора та клавіатури забезпечує найпростіший інтерфейс користувача: за допомогою клавіатури керують комп'ютерною системою, а за допомогою монітора отримують результат. Клавіатура відноситься до стандартних засобів ПК, тому для реалізації її основних функцій не вимагається наявність

спеціальних системних програм (драйверів). Клавіатура стаціонарного ПК, як правило, - це самостійний конструктивний блок, а в портативних ПК вона входить до складу корпуса.

Клавіатури мають по 101-104 клавіші, розміщені за стандартом QWERTY (у верхньому лівому кутку літерної частини клавіатури знаходяться клавіші Q, W, E, R, T, Y). Відрізняються вони лише незначними варіаціями розташування й форми службових клавішів, а також особливостями, зумовленими мовою, що використовується. Усю сукупність клавішів клавіатури розбито на декілька функціональних груп: алфавітно-цифрові; функціональні; керування курсором; службові; клавіші додаткової панелі.

II.

Існує 3 основні типи комп'ютерної миші.

1) ***Механічна.*** Це тип комп'ютерної миші, яка має гумову або металеву кульку на її донній стороні, яка, в свою чергу, може обертатися в будь-якому напрямку. Механічні датчики всередині миші визначають напрямок, в якому кулька переміщається, і переміщують покажчик на екрані в тому ж самому напрямку. Для роботи миші необхідний спеціальний килимок.

2) ***Оптико-механічна***. Цей тип майже такий же, як і механічна миша, за винятком того, що він використовує оптичні датчики визначення руху кульки. Також необхідний спеціальний килимок для її роботи.

3) ***Оптична.*** Цей тип використовує лазер, щоб виявляти рух миші. Особливої необхідності в використанні килимка немає. Цей тип працює більш швидко і точно, ніж механічні та оптико-механічні комп’ютерні миші.

XIX. Work in groups.

Select a digital device (e.g. a printer, scanner, digital camera, digital music player, etc.) and create promotional materials for a tradeshow booth featuring your “product”.

TEXTS FOR ADDITIONAL READING

I. How has printing changed since Gutenberg's invention?

Today, printing is very different from the process used in Gutenberg's workshop. By modern standards, Gutenberg's printing process may seem slow and tedious; compositors put type together by hand, and a skilled compositor could assemble 2,000 characters or letters in an hour. Today, more words are being printed every second than were printed every year during the fifteenth and sixteenth centuries.

In the late eighteenth century and early nineteenth century, inventors began modifying the printing press by making parts of the press out of metal instead of wood.

Earl Stanhope of England created a printing press with a cast-iron frame. In 1800, he invented the Stanhope Press, which was the first book press made completely out of cast-iron. The press also featured a combination of levers to give the pressman added power. It created powerful, cleaner impressions, which were ideal for printing woodcuts and larger formats. This platen press had a flat surface bearing the paper, which was pressed against the flat-inked plate.

In 1824, Daniel Treadwell of Boston first attempted to mechanize printing. By adding gears and power to a wooden-framed platen press, the bed-and-platen press was four times faster than a handpress. This type of press was used throughout the nineteenth century and produced high-quality prints.

In 1812, Friedrik Koenig invented the steam-driven printing process and dramatically sped up printing. The Koenig Press could print 400 sheets per hour. Richard Hoe, an American press maker made improvements to Koenig's design, and in 1832 produced the Single Small Cylinder Press. In a cylinder press, a piece of paper is pressed between a flat surface and a cylinder in which a curved plate or type is attached. Cylinder presses were much faster than platen and hand presses and could print between 1,000 and 4,000 impressions per hour.

In 1844, Richard Hoe invented the rotary press. A rotary press prints on paper when it passes between two cylinders. The first rotary press could print up to 8,000 copies per hour.

In 1865, William Bullock invented the Bullock Press, which was the first press to be fed by continuous roll paper. The use of roll paper is important because it made it much easier for machines to be self-feeding instead of fed by hand. The first roll papers were over five miles in length. Today, roll paper is still used in many presses.

Until the late nineteenth and early twentieth centuries, all type was set and composed by hand, as in Gutenberg's workshop. Monotype and Linotype machines changed the printing process because they used mechanical means of setting type, which was much more efficient than hand composition.

In a Linotype machine, an operator would type on a keyboard similar to a typewriter, which produced a perforated band of paper. Invented in 1889, the Monotype machine worked much like the Linotype machine. But Monotype had the advantage of being easier to correct because it was possible to remove a single letter of type, rather than having to recast a whole row of type. Monotype also produced a finer quality type, so it was frequently used in the book trade, while linotype was often used at newspaper presses because of its speed and economy.

Although some of the printing techniques we have discussed are still used, many have been revolutionized by the invention of computers. Today, a student using a personal computer is simultaneously doing the jobs of author, editor, and compositor.

II. Where did your mouse come from?

The computer mouse, like so many other aspects of the modern personal computer, had its origins in technologies developed for military purposes during the 1940s (during or around World War II), was further developed by teams of researchers at the Stanford Research Institute (SRI) and the Xerox Palo Alto Research Center (PARC) during the 1960s and '70s, and only became a successful commercial product after it was included in the first Apple Macintosh in 1984.

The first mouse-like device, the trackball, was invented by a British scientist, working at the British Royal Navy Scientific Service in 1946. It was designed to replace the joystick as the main input device for one of the navy's radar systems. No functioning prototype of this trackball was ever built, however, and the device was kept secret by the military.

The first functioning trackball prototype came about in 1952, meanwhile; it was built by a British engineer for an innovative radar system for the Royal Canadian Navy that would combine radar and sonar data from multiple sources into a single system that all ships could access. This trackball was comparable to an upside-down, vintage trackball mouse.

The ball—which in the prototype was a Canadian five pin bowling ball, an object that's about the size of a grapefruit—rested inside a structure that contained rollers, four discs (two on each X and Y axis), and wires. To use the device, the user would roll the ball inside the structure, causing the discs to rotate and strike the wires; the radar system would then convert the data from the wires into the user's onscreen movements.

The first computer mouse that resembled a modern-day computer mouse—and also the first mouse-like device to be used with a general purpose computer—was developed by researchers at the Stanford Research Institute in the 1960s. For registering movement, this mouse had two discs—one for the X axis and one for the Y axis—inside a boxy wooden frame. From the user's perspective, using this mouse involved moving the entire device itself, rolling it along a flat surface—a key departure from the trackball, which required the user to manipulate an object within the device, while the device itself remained stationary.

The mouse also had a single button on top of it (towards the front, and to the right) and a cord running out of the back of it, whose tail-like appearance was the inspiration for the device's name. The first prototype was built in 1963, and SRI demonstrated the device to the public for the first time in 1968.

The SRI mouse went on to inspire the mice of the Xerox Alto (1973), the world's first mouse-driven PC, and the Xerox Star (1981), the world's first commercially-available mouse-driven PC - which in turn inspired the world's first commercially-successful mouse-driven PC, the Apple Macintosh 128K (1984). One of the differences between the SRI mouse and the Alto, Star, and Macintosh mice were that the latter three were trackball mice - or upside-down, encased trackballs, which relied on rollers, discs, light, and sensors to translate the mice's movements into movements onscreen.

Most computer mice in use today are neither disc-based or trackball mice, of course, - the majority of them are optical mice, which don't require any mechanical parts, just light, sensors, and image-processing chips, to register movement.

Optical mice first emerged from R&D labs in the early 1980s, but the technology only became affordable to the average consumer in the late 1990s. Finally, the first commercially-available wireless mouse, the Logitech Mouseman Cordless, came out in 1991, and the first commercially-available mouse with a scroll wheel, the Genius EasyScroll, was released in 1995.

UNIT 5
Internal hardware

I. Study the following words and expressions:

to install - встановити
case - корпус
the motherboard - "материнська" плата, системна плата
internal buses - внутрішні шини
integrated circuit - інтегральна схема
register - регістр
board - плата
ALU (Arithmetic and Logic Unit) - арифметично - логічний пристрій
circuit board - схемна плата
expansion slot - резервне гніздо, гніздо для розширювальної платы
path - канал, маршрут
front side bus - зовнішня шина
expansion card - карта розширювання
RAM - оперативна пам'ять
ROM - постійна пам'ять
volatile - непостійний
BIOS (Basic Input/ Output System) - базова система введення - виведення
magnetic storage - магнітна пам'ять, ЗП на магнітному носії
access time - час доступу
read/ write head - головка читання/ запису, універсальна головка
removable flash memory - пристрій зберігання даних із з'ємним носієм на базі флеш-технологій
solid state memory - (твірдотілий) напівпровідниковий записуючий

		пристрій
non-volatile	-	невитирний, енергонезалежний, постійний
contaminant	-	забруднювач
reliable	-	надійний
pits	-	щербина, яма
susceptible	-	сприйнятливий, чутливий
humidity	-	вологість
fingerprints	-	відбитки пальців
magnet	-	магніт
to spill	-	розливати
soft drinks	-	безалкогольні напої
reusable	-	багаторазовий
grid	-	сітка, рішітка
low-power chip	-	малопотужний чіп
durable	-	стійкий, міцний, надійний

II.Read and translate the text.

Internal hardware

"Internal" is a term used to describe a device that is installed within the computer. For example, a video card is an internal device since it is found inside of the computer case. The internal hardware parts of a computer are often referred to as components, while external hardware devices are usually called peripherals.

The main circuit board is known as ***the motherboard.*** This contains the CPU, the memory chips, expansion slots and controllers for peripherals, connected by internal buses, or paths that carry electronic signals. For example, the front side bus carries all data that passes from the CPU to other devices. Expansion slots allow you to install expansion cards which provide extra functions, e.g. video card or a modem. Laptops have PC cards, the size of a credit card, which add features like sound, memory and network capabilities.

The processor (also called the CPU) or central processing unit, is the brain of your computer. In PCs, it is built into a single chip – a small piece of silicon with complex electrical circuit, called an integrated circuit – that executes instructions and coordinates the activities of all the other units. CPU consists of three typical parts: 1) the control unit, which examines instructions from memory and executes them; 2) the arithmetic and logic unit (ALU), which performs arithmetic and logical operations; 3) the registers, high-speed units of memory used to store and control data. The speed of a processor is measured in gigahertz (GHz). Thus, a CPU running at 4GHz can make about four thousand million calculations a second.

RAM (random access memory) is a temporary holding area for data, application program instructions, and the operating system. RAM is usually several chips or small circuit boards that plug into the system board within the computer's system unit. It holds raw data waiting to be processed as well as the program instructions for processing that data. RAM also holds the results of processing until they can be stored more permanently on disk or tape. The amount of RAM determines the number of programs you can run simultaneously and how fast they operate. It can be expanded by adding extra RAM chips.

ROM (read-only memory) is a type of memory circuitry that holds the computer's startup routine. Whereas RAM is temporary and volatile, ROM is permanent and non-volatile. ROM circuitry holds "hard-wired" instructions that are a permanent part of the circuitry and remain in place even when the computer power is turned off. ROM contains a small set of instruction called the ROM BIOS (basic input/output system).

A computer works with data that has been coded into bits that can be represented by 1s and 0s. Obviously, the data is not literally written as "1" or "0". Instead, the 1s and 0s must be transformed into changes in the surface of a storage medium. Exactly how this transformation happens depends on the storage technology. Three types of storage technologies are used for the personal computer: magnetic, optical, and solid state.

Hard disk, floppy disk, and tape storage technologies can be classified as ***magnetic storage***, which stores data by magnetizing microscopic particles on the disk or tape surface. Before data is stored, particles on the surface of the disk are scattered in random patterns.

Most PCs have one internal hard disk, usually called C drive, which can hold several gigabytes of data. It's used to keep the operating system, the programs and the user's files easily available for use. Hard disks are not as durable as many other storage technologies. The read-write heads in a hard disk hover a microscopic distance above the disk surface. If a read-write head runs into a dust particle or some other contaminant on the disk, it might cause a head crash, which damages some of the data on the disk. Some experts estimate that the reliable life span of data stored on magnetic media is about three years.

CD and DVD storage technologies can be classified as ***optical storage***, which stores data as microscopic light and dark spots on the disk surface. The dark spots are called pits. The lighter, non-pitted surface areas of the disk are called lands. An optical storage device uses a low-power laser light to read the data stored on an optical disk. An optical disk, such as a CD, is not susceptible to humidity, fingerprints, dust, magnets, or spilled soft drinks, and its useful life is estimated at more than 30 years.

A variety of compact storage cards can be classified as ***solid state storage***, which stores data in a non-volatile, reusable, low-power chip. The chip's circuitry is arranged as a grid, and each cell in the grid contains two transistors that act as gates. When the

gates are open, current can flow and the cell has a value that represents a “1” bit. When the gates are closed, the cell has a value that represents a “0” bit. Once the data is stored, it is non-volatile – the chip retains the data without the need for an external power source.

Solid state storage is portable, provides fast access to data, and uses very little power, so it is an ideal solution for storing data on mobile devices and transporting data from one device to another. It is widely used in portable consumer devices, such as digital cameras, MP3 music players, notebook computers, PDAs, and cell phones. A USB flash drive is a portable storage device. It is durable and requires no card reader, making it easily transportable from one computer to another. You can open, edit, delete, and run files stored on a USB flash drive just as though those files were stored on your computer’s hard disk.

TEXT-BASED ASSIGNMENTS

III.Discuss the following questions.

1.What does the term “internal” mean?
2. What is the motherboard? What does it contain?
3. What exactly is a microprocessor? How does it work? What parts does it consist of?
4. Where does the microprocessor get its instructions?
5. What part of the CPU solves arithmetic problems?
6. What part of the CPU plays the role of data storage?
7. What is RAM?
8. What is used to measure the amount of RAM?
9. What information is lost when the computer is switched off?
10. If a computer has RAM, why does it need ROM?
11. Where does a computer store its basic hardware settings?
12. What basic storage technologies are used in personal computers?
13. How does magnetic storage work?
14. How does optical storage work?
15. What are the advantages of solid state storage?

IV.Give English equivalents to the words and collocations given below.

Бути встановленим в комп'ютері; корпус комп’ютера; схемна плата; материнська плата; мікросхема пам'яті; слоти розширення; контролери для периферійних пристроїв; внутрішні шини; надавати додаткові функції; мережеві можливості; інтегральні схеми; виконувати інструкції; регулювати діяльність всіх вузлів; швидкісний пристрій пам'яті; оперативна пам'ять; прикладна програма; зберігати необроблені дані; розширювати(ся); постійний

запам'ятовуючий пристрій; програма запуску комп'ютера; читаючи та записуючи головки; викликати руйнування головки; пошкодити дані; надійний термін служби; чутливі до вологості; карта пам'яті; енергонезалежний; багаторазовий; малопотужний чіп; сітка; зберігати дані; забезпечити швидкий доступ до даних; передавати дані з одного пристрою в інший; портативний споживчий пристрій; мобільні телефони; міцний; запускати та видаляти файли.

V.Give synonyms to the following words:

inner, to characterize, to bear, to let, enlargement, additional, to attach, intellect, composite, components, momentary, to posses, constantly, to define, order, to be depicted, apparantley, alteration, imperceptible, to be dispersed, accidental, obtainable, firm, to bump into, pollution, to give rise to, wreck, to harm, safe, sensitive, to evaluate, to be organized, entrance, explanation, to cancel.

VI.Give antonyms to the words given below:

decrease, to dismantle, to take away, inability, elementary, constant, to decipher, fragile, untrustworthy, resistant, immovable.

VII.Choose the ending for each sentence from the proposed versions.

1. A storage device is the mechanical apparatus
   a) that hovers over the surface to read data.
   b) that records and retrieves data from a storage medium.
2. After data is processed, it is held temporarily in RAM,
   a) you should still handle and transport them with care.
   b) but it is usually copied to a storage medium for more permanent safekeeping.
3. Before data is stored,
   a) particles on the surface of the disk are scattered in random patterns.
   b) dark spots appear in the dye that are read as pits.
4. Hard disk, floppy disk, and tape storage technologies can be classified as magnetic storage,
   a) making it easily transportable from one computer to another.
   b) which stores data by magnetizing microscopic particles on the disk or tape surface.
5. The surface of an optical disk is coated with clear plastic,
   a) which damages some of the data on the disk.
   b) making the disk less susceptible to environmental damage than data recorded on magnetic media.

6. An optical disk, such as a CD, is not susceptible to magnets, dust, humidity,

a) and transfers data from a disk to RAM before it is actually processed.

b) and its useful life is estimated at more than 30 years.

7. The motherboard allocates power and allows

a) communication to the CPU, RAM, and all other computer hardware components.

b) the user to control a character or machine in a computer program, such as a plane in a flight simulator.

8. Data stored in ROM may

a) be stored and retrieved on a computer.

b) only be read.

9. DVD, in full digital video disc or digital versatile disc, is a type of

a) disk storage composed of a disk of thin and flexible magnetic storage medium, sealed in a rectangular plastic enclosure lined with fabric that removes dust particles.

b) optical disc used for data storage and as a platform for multimedia.

10. A USB flash drive is typically

a) removable, rewritable and much smaller than an optical disc.

b) irreplaceable at the work on the computer.

VIII. Which word does not belong to the group?

a) transportable, optical, susceptible, particle;
b) gates, retrieves, provides, handles;
c) storage, medium, magnetic, device;
d) converted, changed, transformed, stored;
e) transport, process, estimate, access;
f) disk, tape, drive, DVD;
j) to perform, to carry out, to interchange, to execute;
k) circuits, schemes, diagrams, cycles;
l) to output, to gift, to display, to release;
m) download, charge, batch, transmission.

IX. Fill in missing words choosing from the proposed variants give.

1. A magnetic storage device uses a read-write head to magnetize … that represent data.

a) lens ***b) particles*** ***c) contents*** ***d) platters***

2. Data on an optical storage medium, such as DVD, is stored as … and lands.

a) lands ***b) bits*** ***c) bytes*** ***d) pits***

3. … time is the average time it takes a computer to locate data on a storage medium and read it.

a) revolution ***b) transporting*** ***c) valuable*** ***d) access***

4. The laser creates dark spots in the dye layer that are read as … .

a) areas ***b) plates*** ***c) pits*** ***d) particles***

5. Higher disk density provides increased storage … .

a) transformation ***b) capacity*** ***c) flexibility*** ***d) data***

6. Hard disks are … to head crashes, so it is important to make backup copies.

a) susceptible ***b) optical*** ***c) retrievable*** ***d) transportable***

7. In the context of magnetic tape, the term "cassette" usually refers to … that holds two reels with a single span of magnetic tape.

a) an enclosure ***b) a pit*** ***c) a read head*** ***d) an internal bus***

8. The processor in a personal computer or … in small devices is often called a microprocessor.

a) transmitted ***b) debugged*** ***c) embedded*** ***d) retrieved***

9. The back end of the hard drive contains a port for a cable that … to the motherboard.

a) deletes ***b) connects*** ***c) converts*** ***d) processes***

10. The motherboard is the main … board in a computer.

a) buses ***b) unit*** ***c) dot*** ***d) circuit***

X. Replace definitions with their terms:

1) the part of a computer that controls all the other parts of the system, such as memory, speed and power supply;
2) computer memory in which data can be changed or removed and then looked at in any order; when you switch the computer off, you lose all the data in this memory;
3) it uses ROM to control the input/output of data;
4) a CD for use on a computer, which has data recorded on it; the data cannot be changed or removed;
5) a connection or port located inside a computer on the motherboard that allows a computer hardware expansion card to be connected;
6) the electronic circuitry within a computer that carries out the instructions of a computer program by performing the basic arithmetic, logical, control and input/output (I/O) operations specified by the instructions;
7) a storage medium that is used with computers and other electronic devices, data stored in it may only be read;
8) a data storage device that includes flash memory with an integrated USB interface. It is typically removable, rewritable and much smaller than an optical disc;
9) a specific physical part of a hard disk that is responsible for reading data from and writing data to the disk;
10) an input device that reads flash memory cards.

XI. Complete the sentences with the words in the box. Translate the sentences.

I. ***a) floppy disk drive b) access time c) clock d) chips e) transfer rate f) backup g) slots h) hard disk***

1. The first rule of data storage is to make a **…** of all important files.
2. A **…** is slower than a hard drive and can only hold 1.44 MB disks.
3. The **…** inside your computer is made of aluminum alloy and covered with a magnetic coating. This makes the disk itself a rigid plate, hence its name.
4. This hard drive is a 60 GB IBM model with a fast **…** of 8 milliseconds.
5. The **…** is the rate of transmission of data from the disk to the CPU. This is usually described in megabytes per second.
6. Intel **…** are used in many computers.
7. Special cards can be inserted into expansion **…** .
8. A **…** controls the timing within the PC by sending signals to synchronize its circuits and operations.

II. ***a) chips b) motherboard c) dual core d) processor e) megabytes f) speed g) megahertz h) upgraded***

The "brain" of a computer is the **…** . Most of these are made by Intel and AMD, and are sometimes referred to as "**…**". The fastest processors are **…**, which means that there are two processors working there. The **…** of a processor is measured in **…**, which is usually written as MHz. A computer's memory is measured in **…** . If a computer has 1,024 megabytes of memory and the memory type is SDRAM, this is written as 1,024 MB SDRAM, and is pronounced "a thousand and twenty-four megabytes ess-dee-dram". The processor and memory modules are located on the **…** . Changing a computer's processor is not generally practical, but the memory can usually be **…** .

XII. Select the appropriate variant from the proposed ones.

1. Which of the following statements about hard disk is not true?
   a) it stores data ***b) it's not a peripheral***
   c) it's a magnetic device ***d) it's placed inside a computer***
2. This storage format is used to store digital video or computer data.
   a) a floppy disk ***b) CD*** ***c) a sound card*** ***d) DVD***
3. What are the elements of a computer system?
   a) disk drives ***b) a monitor***
   c) a central processor ***d) all of the above***

4. These portable computers are ideal for mobile users. They are easy to carry and can be used outdoors without the need for an electrical outlet.

a) mainframes b) notebooks c) workstations d) servers

5. Which of the following functions can a floppy disk drive perform?

a) store data b) read data c) write data d) all of the above

6. This electronic device has a special pen and acts like an electronic piece of paper transferring images to the computer screen.

a) a laptop b) PDA c) a tablet computer d) a mainframe

7. As a result of the power being off RAM does not … any instructions for the microprocessor to execute.

a) contain b) allocate c) develop d) provide

8. The ALU uses registers to hold data as the microprocessor … arithmetic and logical operations.

a) gains b) compares c) performs d) exchanges

9. When the microprocessor receives electrical power, it is ready to begin … instructions.

a) executing b) exchanging c) allocating d) holding

10. The instructions for loading the operating system into RAM when a computer is first turned on are stored in … memory.

a) RAM b) CMOS c) RISC d) ROM

11. A microprocessor (sometimes simply referred to as a "processor") is an integrated circuit … to process instructions.

a) affected b) performed c) held d) designed

12. ___ storage devices store data in a non-volatile, erasable, low-power chip.

a) optical b) magnetic c) solid state d) none of the above

13. RAM is considered to be volatile memory because ___.

a) it sporadically loses information b) it requires electrical power to hold data
c) data stored in it can randomly duplicate itself d) it's measured in GB

14. All of the following are examples of storage medium except ___.

a) a CD b) paper c) a keyboard d) a DVD

15. Storage device that stores data as pits and lands is referred to as ___.

a) tape b) floppy disk c) CD-ROM d) hard drive

XIII. Make three-word expressions combining words from three lists: A, B and C. Then fill in the gaps in the following sentences.

A:	**B:**	**C:**
random	***system***	***processor***
read-only	***access***	***storage***
computer	***data***	***circuitry***
tape	***core***	***configuration***

dual ***memory*** ***memory***

1. A **…** is faster than one with a single core.
2. The battery trickles power to the CMOS chip so that it can retain vital data about your **…** .
3. **…** holds the results of processing until they can be stored more permanently on disk or tape.
4. **…** holds "hard-wired" instructions that are a permanent part of the circuitry and remain in place even when the computer power is turned off.
5. 60% of the world's data is stored on tape and, despite predictions of its imminent demise, **…** seems to keep developing and providing a good long term archival platform for data storage.

XIV. Fill in the gaps in the text forming the necessary parts of speech from the words given in brackets.

I.

Hard disks (hard drives) are used to _____ ***(storage)*** large amounts of data in PCs, laptops and other _____ ***(digits)*** systems. The main hard disk in a PC system is where the _____ ***(to operate)*** system, _____ ***(to execute)*** programs and files are stored. These ubiquitous devices have evolved into a storage device _____ ***(capability)*** of storing 1TB (terabyte) of data and more.

A computer can have more than one hard drive. These _____ (to add) drives can either be internal (inside the box) or external. Hard disk drives _____ ***(containing)*** platters (disk like objects) that _____ ***(rotation)*** at speeds of 5400 rpm and above. There is a _____ ***(to devise)*** called an actuator, which can be likened to an arm, which _____ ***(movable)*** across the platters and reads or writes the _____ ***(informative),*** through the use of READ/WRITE heads. The platters are made from an aluminium substance, these devices are a lot more _____ ***(to rely on)*** now than they used to be, although they can breakdown _____ ***(mechanics)*** if you drop them.

II. Direct-attached storage

Direct-attached _____ ***(to store)*** refers to a computer storage system that is _____ ***(direct)*** attached to your server or PC instead of being ____ ***(attachment)*** directly to a network. Direct-attached storage is not _____ ***(limitation)*** only to internal storage. It can also _____ ***(utilization)*** an external disk enclosure that contains hard disk drives, including just-a-bunch-of-disks (JBOD) enclosures.

Although a common example of direct-attached storage is the internal hard drive in your computer, more commonly it refers to a _____ (dedication) storage array that is attached directly to your servers. _____ ***(multiply)*** computers can use the same direct-attached storage (for example, if you're using Failover Clustering), if each

computer has a _____ ***(separator)*** connection to the storage and the array _____ ***(support)*** the usage you have in mind (for example, it's certified for use with Failover Clustering).

XV. Choose the correct variant among ones proposed in brackets.

1. The best method of determining how many connections, ports, or _____ ***(slots/ insertions/ pits)*** are available for your motherboard is to look _____ ***(down/ up/ after)*** the specifications _____ ***(bought/ hidden/ contained)*** in its documentation.
2. The CPU is _____ ***(inserted/ wrapped/ glued)*** into the socket pin-side-down, and a small lever helps to _____ ***(program/ secure/ clean)*** the processor.
3. If a thread is understood as a single piece of a computer process, then using multiple threads in a single CPU core means more instructions can be understood and _____ ***(processed/ rearranged/ rejected)*** at once.
4. SD cards are by far the most common type of memory card. They are _____ ***(ambiguous/ compatible/ dismissed)*** with the majority of digital cameras.
5. Micro SD cards are the smallest commercially _____ ***(mysterious/ available/ rotten)*** memory card at 15×11×1mm but can _____ ***(store/ intermingle/ display)*** up to 2GB of information.
6. Two heads, one on each side of a disk, read or write the data as the disk _____ ***(twists/ spins/ interlaces).***
7. By using separate processors for system and graphics processing, computers are able to _____ ***(handle/ alternate/ reformate)*** graphic-intensive applications more _____ ***(complicated/ intricately/ efficiently).***
8. Most desktop computers contain a CPU _____ (***adorned/ developed/ hooded)*** by either Intel or AMD, both of which use the x86 processor architecture.
9. The _____ ***(tracks/ highways/ roads)*** on a DVD are closer and the _____ ***(ditches/ pits/ hollows)*** are smaller, allowing more pits per unit area.
10. Optical storage uses _____ ***(lasers/ sunshine/ radiation)*** and lights as its method of reading and writing data.
11. Storing data online and in _____ ***(heaven/ sky/ cloud)*** storage is becoming popular as people need to _____ ***(jump into/ access/ intrude)*** their data from more than one device.
12. Many people have had the experience of losing a document they were working _____ ***(under/ on/ through)*** after an unexpected power _____ ***(outage/ broadcast/ supply)*** or system _____ ***(implementation/ renaming/ crash).*** In these cases, the data was lost because it was stored in system memory, which is _____ ***(volatile/ elusive/ windy).***
13. If a document has been _____ ***(sealed/ saved/ closed)*** to a hard drive prior to a power outage or system crash, the user will still be able to _____ (***retrieve/ wipe out/ descry)*** it when the system is back _____ ***(down/ to/ up)*** and running.

14. Data _____ ***(transferred/ formatted/ coded)*** from the computer to the floppy disk is _____ ***(relayed/ packed/ investigated)*** in the form of a binary code and received in the form of magnetic pulses, while the disk in turn _____ ***(conveys/ reports/ communicates)*** magnetic patterns that the computer receives as a binary code.
15. A third-party software _____ ***(utility/ aggregate/ variables)*** can scan your computer and give a detailed report of everything in your computer, including memory.

XVI. Translate into English.

I.

Процесор - головна мікросхема на материнській платі, виконуюча програмний код. Від характеристик процесора залежить швидкодія і продуктивність комп'ютера. Одним з головних показників роботи процесора є його тактова частота ***(CPU clock speed),*** тобто кількість команд, які він виконує за секунду. Чим вище тактова частота процесора, тим швидше комп'ютер працює. Тактова частота сучасних процесорів досягає 4 ГГц.

Інша важлива характеристика – кількість обчислювальних ядер в одному корпусі або на одному кристалі інтегральної мікросхеми. Перші двоядерні процесори Opteron для серверів були випущені фірмою AMD в 2005 році. З тих пір збільшення кількості ядер вважається одним з найперспективніших способів підвищення продуктивності процесора. Зараз вже можна побачити персональні комп’ютери, що працюють на 8-ядерних процесорах, і сервери – на 16-ядерних.

Крім того, швидкість роботи процесора залежить від об’єму кеш-пам’яті, тобто вбудованої в кристал пам’яті, в якій зберігаються проміжні результати обчислень і найбільш часто використовувані дані. Чим більше об’єм вбудованої пам’яті, тим вище швидкодія.

II.

Основним пристроєм для збереження даних у персональних комп’ютерах є накопичувач на жорстких магнітних дисках. Ці пристрої, як правило, розміщено всередині системного блока. Накопичувачі на жорстких магнітних дисках можуть містити величезні обсяги даних, більші, наприклад, за вміст шкільної бібліотеки.

Зчитування та запис даних на оптичні диски здійснюють спеціальні пристрої. Як носії даних у цих пристроях використовують оптичні диски різних типів - CD, DVD та ін. Оптичні диски використовуються здебільшого для створення фонотек і відеотек та для тривалого зберігання копій даних.

Для перенесення даних від одного комп’ютера до іншого часто використовують флеш-накопичувачі, або «флешки». Для зчитування або запису даних на диск чи «флешку» їх треба вставити у відповідний пристрій або в гніздо, які, як правило, розміщуються на передній панелі системного блока.

TEXTS FOR ADDITIONAL READING

I. Solid-state storage devices

The term ‘solid-state’ essentially means ‘no moving parts’. Solid-state storage devices are based on electronic circuits with no moving parts (no reels of tape, no spinning discs, no laser beams, etc.)

Solid-state storage devices store data using a special type of memory called flash memory. Flash memory is a type of Electronically-Erasable Programmable Read-Only Memory (EEPROM). Flash memory is non-volatile (like ROM) but the data stored in it can also be erased or changed (like RAM). Flash memory can be found in many data storage devices.

You might wonder why, since flash memory is non-volatile, normal computers don’t use it instead of RAM. If they did we would have computers that you could turn off, turn back on again and no data would be lost – it would be great!

The reason is speed – saving data to flash memory is very slow compared to saving it to RAM. If a computer were to use flash memory as a replacement for RAM it would run very slowly.

However, some portable computers are starting to use flash memory in the form of solid-state ‘discs’ as a replacement for hard-drives. No moving parts mean less to go wrong and longer battery life.

USB Memory Sticks

Memory sticks (or ‘thumb-drives’) have made many other forms of portable storage almost obsolete. Memory sticks are non-volatile, random-access storage devices. Each of these small devices has some flash memory connected to a USB interface. Plug it into your computer and it appears as a drive. You can then add files, erase files, etc. You can use it to move any type of file between computers.

Flash memory used to be very expensive, but in recent years it has become much cheaper and you can now buy a 16GB memory stick for just a few dollars.

Many of our digital devices (cameras, mobile phones, MP3 players, etc.) require compact, non-volatile data storage. Flash memory cards provide this and come in a variety of shapes and sizes. One of the most common formats used by digital cameras is the SD Card. The cards store the digital images taken by the camera. Mobile phones contain a Subscriber Identity Module (SIM) card that contains the phone’s number, the phonebook numbers, text messages, etc. Many phones also have extra memory cards to store music, video, photos, etc. (e.g Tiny Micro-SD cards).

Many credit cards (e.g. ‘chip-and-pin’ cards), door entry cards, satellite TV cards, etc. have replaced the very limited storage of the magnetic strip (the dark strip on the back of older cards) with flash memory. This is more reliable and has a much larger storage capacity. Cards with flash memory are called smart cards.

II. CD or DVD?

CDs and DVDs have become a common technology in our world today and these two words have often become synonymous for meaning a compact disc. However, these two words actually mean different things. CDs and DVDs are made with a different purpose in mind.

Compact Disc (CD) is an optical disc that is used to store data. These are actually made to replace floppy disks that were used to store files and programs from the computer. The CDs eventually caused the floppy disks to become obsolete. CDs were invented by Philips and Sony independently, but they did collaborate to create a standard format and related player technology (CD player) in 1982. CDs can hold up to 700 MB worth of data, which is approximately 80 minutes of audio. Mini CDs have also been created to store approximately 24 minutes of audio or program drivers.

Though initially CDs were created for storing and playing back sound recording, over the years there have been many different types of CDs produced for different types of work, including CD-Text, CD + Graphics, CD-ROM, Video CD, Super Video CD, Photo CD, etc. All of these CDs are used for different purposes. Standard CDs are commonly used to store songs, data, drivers, programs, etc.

DVDs are similar to CDs and are also an optical disc storage device. These were developed independently by Philips, Sony, Toshiba, and Panasonic in 1995. Prior to this, video and film were being recorded on Video CD (VCD) that was available in the market in 1993. Other formats that came out in the same year included Multimedia Compact Disc (MMCD) and Super Density (SD) disc. The difference in formats caused the companies to come together and set up standards for maintaining one type of format, which resulted in the formation of DVD.

There are also various different types of DVDs including DVD-ROM, DVD-R and DVD-RW, Blu-ray. When DVD players were created, they had backward capability, which allowed CDs to be read on them. However, many CD-players could not read DVDs, which meant that people would specifically have to go and buy these players. DVDs allowed users to hold data up to 17.08 GB on a dual-layer, dual-sided disc. A single layered, single-sided disc holds approximately 4.7 GB of data.

CDs and DVDs are generally made using some of the same materials and manufacturing methods, with the major difference being the data capacity between the two. CDs and DVDs are made using polycarbonate plastic, which is approximately four one-hundredths (4/100) of an inch or 1.22 mm thick. The plastic is an injection-molded piece of clear polycarbonate plastic, which then has microscopic bumps that are arranged as a single, continuous, extremely long spiral track of data. The plastic is then followed by a clear reflective aluminum layer, then a thin acrylic layer to protect the aluminum. This is followed by label that is printed onto to the acrylic layer. The CD and DVD have a single track of data in the form of a spiral, which starts as the center going outwards. The data is stored on the bumps or pits which are then read by

the CD/DVD layer. The bumps/pits on a DVD are much smaller than on CD, allowing the DVD to store more data. DVD also comes with more storage layers compared to CDs.

UNIT 6
Software basics

I.Study the following words and expressions:

to accomplish	-	виконати
tax return	-	податкова декларація
to download	-	завантажити
to compose of …	-	складається з …
software package	-	програмний пакет
executable	-	виконуваний файл
to launch	-	запускати
extension	-	розширення
to run (a program)	-	запустити програму
support	-	підтримка
in conjunction with	-	в поєднанні з
to activate	-	активувати
data files	-	файли даних
a developer	-	розробник
source code	-	вихідний код
modular approach	-	модульний підхід
software environment	-	програмне середовище
utility	-	утиліта
to supervise	-	контролювати, наглядати
to facilitate	-	сприяти, полегшувати
faults	-	несправності
compiler	-	компілятор, укладач
assembler	-	асемблер
interpreters	-	перекладач
routine	-	рутина, режим
to invoke	-	викликати
entertainment	-	розваги
a spreadsheet	-	електронна таблиця
diverse	-	різноманітний

endeavors	-	намагання, старання, зусилля
to improve	-	поліпшити, вдосконалити

II.Read and translate the text.

Software basics

Computer software determines the types of tasks a computer can help you accomplish. Some software helps you create documents, while other software helps you edit home videos, prepare your tax return or design the floor plan for a new house.

The instructions that tell a computer how to carry out a task are referred to as a computer program. These programs form the software that prepares a computer to do a specific task. In popular usage the term "software" refers to one or more computer programs and any additional files that are provided to carry out a specific type of task. Whether it's on a CD or downloaded from the Web, today's software is typically composed of many files. At least one of the files included in a software package contains an executable program designed to be launched, or started, by users. On PCs these programs are stored in files that typically have *.exe file* extensions and are referred to as "executable files". Other files supplied with a software package contain programs that are not designed to be run by users. These "support programs" contain instructions for the computer to use in conjunction with the main user-executable file. A support program can be activated by the main program as needed. Support programs often have file extensions such as *.dll* and *.ocx*.

In addition to program files, many software packages also include data files. As you might expect, these files contain any data that is necessary for a task, but not supplied by the user, such as Help documentation. The data files are supplied with a software package files extensions such as *.txt, .bmp,* and *.hlp*. The use of a main user-executable file plus several support programs and data files offers a great flexibility and efficiency for software developers. Support programs and data files from existing programs can usually be modified by developers for other programs without changing the main executable file. This modular approach can reduce the time required to create and test the main executable file, which usually contains a long and fairly complex program.

Most software provides a task-related environment, which includes a screen display, a means of collecting commands and data from the user, specifications of the environment such as where the objects appear, its shape, color and behavior.

A programming language provides the tools a programmer uses to create software and produce a lengthy list of instructions, called source code, which defines the software environment in every detail.

Software is categorized as system software or application software. The primary purpose of system software – your computer's operating system, device drivers,

programming languages, and utilities – is to help the computer to carry out its basic operating functions. System software exists to supervise the operation of the machine and to facilitate easy access to the various hardware resources.

System software can be broken down into several categories:

1. The operating system: programs which supervise the operation of the entire system including controlling the execution of all other software and diagnosing faults.

2. Language processors: programs which translate application software written in high-level languages into the low-level binary machine instructions which the processor executes. There are three main types: compilers, assemblers, and interpreters.

3. Library and utility programs: software to help the application programmer. It consists of standard commonly used software routines which the user may invoke (e.g. for copying files of data).

The primary purpose of application software is to help people carry out tasks using a computer. Most computers include some Text basic word processing, e-mail, and Internet access software, but computer owners want additional software to increase their computer's productivity, business, learning, or entertainment capabilities. ***Document production software*** assists you with composing, editing, designing, printing, and electronically publishing documents, for example, Word processing software, such as Microsoft Word or Web authoring software which helps you design and develop customized Web pages that you publish electronically on the Internet. ***A spreadsheet*** uses rows and columns of numbers to create a model or representation of a real situation. Today, spreadsheet software, such as Microsoft Excel, provides tools to create electronic spreadsheets. Spreadsheets are popular with accountants and financial managers who deal with paper-based calculations. ***Database Software*** helps you enter, find, organize, update, and report information stored in a database as a series of records, which are composed of fields that hold data. Microsoft Access, FileMaker Pro, and ask Sam are three of the most popular examples of database software for personal computers. ***Graphic Software*** is designed to help you create, manipulate, and print graphics. The most popular are paint software, photo editing software, and drawing software, CAD (computer-aided design) software, and presentation software. ***Educational Software*** helps you learn and practice new skills. It is available for such diverse educational endeavors as learning languages, training yourself to use new software, how to play the piano or guitar, and improving keyboarding skills. Exam preparation software is available for standardized tests. ***Reference Software*** category spans a wide range of applications - from encyclopedias to medical references, from map software to trip planners, and from cookbooks to telephone books. ***Computer games*** are the most popular type of entertainment software. ***Music Software*** is represented by audio editing software, CD ripper software, audio encoding software, ear training software.

TEXT-BASED ASSIGNMENTS

III.Discuss the following questions.

1. What is software?
2. What kinds of files are included in a typical software product?
3. Why does software require so many files?
4. How does a programmer "write" software?
5. How does a computer process a program?
6. How is software categorized?
7. How does document production software help us turn our ideas into sentences and paragraphs?
8. What features of document product software can improve my writing?
9. What is a spreadsheet?
10. What other "number-crunching" software is available?
11. What is a database?
12. What is the best selling entertainment software?
13. What is a software suite?
14. Where can I get software?
15. What is included in a typical software package?
16. How do I know if a software program will work on my computer?
17. Why is it necessary to install modern software?
18. What is a software update?
19. How do I get rid of software?
20. Are all software licenses similar?

IV.Mark the following statements as True or False.

1. A computer program is a set of discontinuous coded instructions, interrupted by other commands, that can be inserted into a mechanism (such as a computer).
2. Software is the instructions that the computer follows and which the computer writes itself.
3. Computer software typically consists of many files that contain user executable programs, support programs and data files.
4. Data files are usually primary information archived from a survey.
5. The main executable file provides the primary set of instructions for the computer to execute and calls various support programs and data files as needed.
6. Support programs often have file extensions such as *.txt*, *.bmp*, and *.hlp*.
7. Individuals often write software for their personal computers.
8. System software is supplied by computer manufacturers separately from computer systems.

9. A compiler is involved in the execution of a program.
10. An operating system manages the computer's resources, such as the central processing unit, memory, disk drives, and printers; establishes a user interface, and executes and provides services for applications software.
11. A language processor is a software program designed or used to perform tasks, such as word processing, text editing and documentation creating.
12. Utility programs perform tasks related to the management of computer functions, resources, or files, as password protection, memory management, virus protection, and file compression.
13. Spreadsheets allow easy entry and manipulation of drawings, films and photos.
14. Reference software activate audio and video content.
15. Educational software may be projected onto a large whiteboard at the front of the class and/or run simultaneously on a network of desktop computers in a classroom.

V.Find the English for:

комп'ютерне програмне забезпечення; виконати (завдання); створювати документи; завантажити з Інтернету; зробити конкретне завдання; програмний пакет; виконувані програми; запустити програму; розширення файлу; програми підтримки; в поєднанні з; файли даних; довідкова документація; розробник програмного забезпечення; модульний підхід; технічні характеристики комп'ютерного середовища; вихідний код; системне програмне забезпечення; драйвери пристроїв; наглядати; сприяти; апаратні ресурси; операційна система; діагностувати несправності; текстовий процесор; розважальні можливості; веб-авторинг програмного забезпечення; електронна таблиця; займатися паперовими розрахунками; бази даних програмного забезпечення; оновлювати; програмне забезпечення для редагування фотографій; комп'ютерний дизайн; презентаційне програмне забезпечення; освітні заходи; охоплювати широкий спектр програмних додатків.

VI.Give synonyms to the following words:

assignments, to complete, to arrange, particular, to initiate, to promote, obligatory, to suggest, adaptability, productivity, to transform, attitude, to shorten, to examine, surroundings, actions, to arise, to specify, to oversee, to assist, admission, total, failing, devices, to handle, demonstration, proficiency, to comprise, numerous, to advance, recreation.

VII.Give antonyms to the following words:

to destroy, general, to end, unusual, inessential, insignificant, simple, to extend, to take away, to depart, short, exit, rare, disability, unknown, identical, to worsen, unavailable.

VIII.Fill in the blanks choosing from the variants given.

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

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

2. 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

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

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

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

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

5. System … specify the operating system and minimum hardware capacities required for software to work correctly.

a) requirements b) references c) replacements

6. During the … process, your computer performs many tasks, including updating the Windows Registry and Start menu.

a) uninstallation b) installation c) updating d) copyrighting

7. Public domain software is not copyrighted because the copyright has … .

a) completed b) expired c) replaced d) purchased

8. Database software helps you

a) learn and practice new skills. b) enter and organize information.

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

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

10. 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

11. 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

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

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

13. DVD authoring software … you to add Hollywood style menus to digital videos.

a) lets b) makes c) allows d) helps

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

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

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

executable	***language***
application	***code***
software	***file***
machine	***program***
source	***extensions***
file	***software***
utility	***package***
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 file name "myfile.txt" has a … of ".txt" associated with text files.
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.
7. A … is simply multiple applications or code modules that work together to meet various goals and objectives.
8. A … is used to support the computer infrastructure in contrast to application software, which is aimed at directly performing tasks that benefit ordinary users.

X.Match the following terms with their definitions.

TERMS	DEFINITION
File	1)an assemblage of files and information about those files.
Software package	2) a software program or utility used for creating, editing and maintaining database files and records.
Data files	3) the set of facilities, such as operating system, windows management, database, etc., that is available to a program when it is being executed by a processor.

Help documentation	4) a software application that allows you to draw, edit, and manipulate an image or graphic file.
Programming language	5) a set of related data that has its own name.
Source code	6) a software that communicates with the hardware and allows other programs to run.
Software environment	7) a computer software or internet web-page, the primary purpose of which is teaching or learning, including self-learning.
Operating system	8) a vocabulary and set of grammatical rules for instructing a computer or computing device to perform specific tasks.
Language processor	9) a computer file which stores data to be used by a computer application or system. It generally does not refer to files that contain instructions or code to be performed.
Graphic program	10) a table of values arranged in rows and columns.
Spreadsheet	11) the list of human-readable instructions that a programmer writes—often in a word processing program—when he is developing a program. It is run through a compiler to turn it into machine code.
Database software	12) a software program designed or used to perform tasks, such as processing program code to machine code.
Educational software	13) a documentation component of a software program that explains the features of the program and helps the user understand its capabilities.

XI.Choose the best word to complete the sentences:

1. Software which is easy to use is ***(user-easy/ user-friendly/usable).***
2. Software which is obvious to use is ***(intuitive/guessable/comprehensible).***
3. Software which is not obvious to use is ***(counter-intuitive/ unintuitive/ non-intuitive).***
4. Software for use by students and institutes is ***(learning/ teaching/ educational).***
5. Software for use by businesses is ***(commercial/businesslike/ busy).***
6. Software made specially for one company is ***(one off/ unique/ tailor-made).***
7. Software for use at home is ***(for home use/for house use/for household use).***

8. Software which has been illegally copied is ***(unreal/ pirated/ fake).***
9. Software which has been bought from the company that produced it is ***(real/ justified/ licensed).***
10. Software which works with different types of media which are connected with each other is ***(graphic/ multimedia/ reference).***

XII. Fill in the gaps in the text inserting appropriate words.

1)Software consists of computer ___ ***(programs/ units/ points)*** and data files that work together to provide a computer with the ___ ***(instructions/ approaches/ wishes)*** and ___ ***(data/ tools/ ways)*** necessary for carrying ___ ***(on/ in/ out)*** a specific type of task, such as document production, video editing, graphic design, or Web ___ ***(browsing/ creating/ digitizing).***

To create a software ___ ***(efficiency/ environment/ conveniences),*** a programmer must define the ___ ***(approaches/ properties/ measures)*** 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/ foreign/ machine)*** languages. A computer's microprocessor understands only ___ ***(machine/ high-level/ disapeared)*** language, however, so a program that is written in a high-level language must be ___ ***(avoided/ compiled/ transmitted)*** or interpreted before it can be ___ ***(processed/ modified/ sent).***

2) Utility software is a type of system software that is designed to _____ ***(perform/ achieve/ attach)*** a specialized task, such as system _____ ***(welding/ maintenance/ dissolving)*** or security. Utility software that does not come _____ ***(cleaned/ written/ packaged***) with an operating system is often referred to as a third-party utility. In past years, antivirus _____ ***(pits/ software/ pointing devices)*** was a popular category of third-party utilities. With the recent influx of nuisance _____ ***(ads/ telegrams/ cables)***, ***(intrusion/ creative/ senseless)*** attempts, and spam, utilities such as ads blockers, personal firewalls, and spam _____ ***(filters/ processors/ nets)*** have also become best sellers.

3) Filtering software is used by parents to block their children from_____ ***(objectionable/ reasonable/ informative)*** Websites. Another popular category of _____ ***(pirate/ spam/ utility)*** software is system utilities. These utilities _____ ***(track down/ see off/ pull down)*** and fix disk errors, repair _____ ***(programmable/ corrupted/ refined***) files, and give your PC a performance – _____ ***(enhancing/ decorating/ curing)*** tune-up.

4) A final group of utilities worth mentioning is _____ ***(invested/ designed/ wrapped)*** for _____ ***(backing up/ rolling up/ finding out)*** and cleaning up hard disks.

They can help you_____ ***(recover/ refuse/ accept)*** files _____ ***(programmed/ deleted/ checked)*** by mistake.

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

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

XIV.Choose the correct form of the words in brackets to fill in the gaps.

I. Software Piracy

Software is easy to steal. You can simply borrow your friend's DVD Workshop … ***(to distribute)*** CDs and … ***(installation)*** a copy of the program on your computer's hard disk. **…** ***(pirate)*** takes many forms including friends loaning distribution disks to each other and installing software on more computers than the license … ***(permission).***

Counterfeiting is the large-scale illegal … ***(to duplicate)*** of software distribution media, and sometimes even its … ***(to package).*** According to Microsoft, many software … ***(to counterfeit)*** groups are linked to … ***(organization)*** crime and money-… ***(laundry)*** schemes that … ***(fund)*** a … ***(diversification)*** collection of illegal activities, such as … ***(smuggler),*** … ***(gambler),*** … ***(to extort).***

The Business Software Alliance (BSA) … ***(estimation)*** that more than 800.000 Web sites illegally … ***(seller)*** or distribute software. Software production fuels economic … ***(to develop)*** of many countries. A BSA economic impact study … ***(conclusion)*** that lowering global piracy from an average of 36 % to only 26 % would add more than 1 million jobs and $400 billion in worldwide economic … ***(to grow).***

II.

Utility programs include data base … ***(manager)*** systems, query languages, report … ***(to generate),*** and standardized processing functions for such tasks as copying, editing, and sorting files.

Word … ***(process)*** is a computer application that … ***(resemblance)*** typewriting but is far more versatile. Word processing accounts … ***(under/ on/ for)*** at least of the total use of personal computers. There are more than 300 word-… ***(processor)*** programs on the market.

Business Application programs are … ***(availability***) for almost anything that needs to be done in the offer except emptying the wastebaskets. Dozens of programs make it easier than ever before to prepare budgets, keep track of inventory, and handle mailing lists. Even … ***(to own)*** of the smallest business find computers … ***(to help),*** while large businesses literally could not … ***(operator)*** today's world without them.

The computer is a … ***(power)*** teaching tool. Good software is available for … ***(to read),*** … ***(to spell),*** vocabulary, and grammar. Science programs cover such topics as volcanoes and dinosaurs to high-school chemistry and college optics.

XV.Match the type of software with the definition:

1) trial version
2) shareware
3) freeware
4) home-use version
5) professional version

a) a simplified version which is cheaper to buy.
b) software which is in the public domain. Anybody can use it without paying.
c) the full version with all the features.
d) You can try it for a while for free. Then if you want to keep using it, you are expected to pay a small fee to the writer.
e) You can use it for free for a while (often a month). When the trial period finishes, you have to pay, or the program will de-activate.

XVI.(A) Copy the words. Put the sign either = or ≠ between the following pairs of words according to the model: to install ≠ to deinstall, to use = to apply.

major	□	principal
compatible	□	incompatible
significant	□	considerable
simple	□	complicated
insecure	□	dangerous
similar	□	dissimilar
producer	□	manufacturer
security	□	safety
to attempt	□	to try

to appear to disappear
to apply to employ

(B) Fill in the gaps with the words given above.

1. New computer software is often ___ with older computers.
2. Pascal went ahead with the experiment even though he knew it was ___.
3. Strict ___ measures were in force during the President's visit.
4. Do not ___ to repair the printer yourself.
5. To increase their profits, firms usually aim to ___ the most efficient and advanced technique.
6. Always follow the instructions of the ___.
7. The procedure for creating a new file is very ___.
8. The BBC will show all the ___ games of the tournament.
9. E-commerce is a ___ way of buying goods and paying for them on the Internet.
10. The discovery marks a ___ technological advance.
11. Installation of the ___ system will take several days.
12. Apple Computer, Inc. is a ___ manufacturer of personal computers with headquarters in Cupertino, California.
13. Various countries have enacted [принимать] data protection laws, which are ___ in general but significantly ___ in detail.
14. The company has invested a ___ sum of money in ergonomic workstations.
15. In an interview, ___ to ask questions that don't just need 'Yes' or 'No' as an answer.
16. The test is ___ to diagnose a variety of diseases.
17. Defective goods should be returned to the ___.
18. It is dangerous to drive without putting on ___ belts.
19. The new system will be ___ with existing equipment.
20. Computer engineers consider that a new generation of more powerful PCs will ___ in the nearest future.

XVII.Translate into English.

1. Комп'ютерна програма є послідовністю команд, які вказують комп'ютеру як узятися за розв'язання певної задачі.
2. Сучасні прикладні програми дозволяють розв'язувати найрізноманітніші задачі в багатьох сферах людської діяльності.
3. Прикладне та системне програмне забезпечення доповнюють одне одне в тому розумінні, що виконання прикладної програми є неможливим без останнього.
4. Аби досягти поставленої мети цей складний програмний продукт не слід розробляти власними силами.

5. Системне програмне забезпечення контролює використання різного апаратного забезпечення, такого як пам’ять, процесор тощо.
6. Розробка системного програмного забезпечення є складним завданням, яке вимагає широких знань обчислювальної техніки.
7. Операційні системи контролюють роботу всієї системи, включаючи керування виконанням усіх інших програм і діагностику несправностей.
8. Утиліти це спеціалізовані програми, що виконують повсякденні завдання, в яких часто виникає потреба.
9. Системне програмне забезпечення існує для того, щоб контролювати роботу машини та полегшувати доступ до різних апаратних ресурсів.
10. Системне програмне забезпечення робить можливим виконання на комп’ютері прикладних пакетів із економією часу і зусиль.

XVIII. Render in English.

Системне Програмне забезпечення ділиться такі на різновиди: базове ПЗ та сервісне ПЗ або утиліти (програми для діагностики стану комп'ютера, антивірусні засоби).

Прикладне програмне забезпечення або додатки – софт, призначений для виконання конкретних завдань користувача, розрахований на безпосереднє «спілкування» з ним і для забезпечення застосування машини в різноманітних сферах життєдіяльності людини.

До прикладного ПЗ ставляться такі види програм як:

- текстові редактори;
- графічні редактори;
- редактори тривимірної графіки;
- системи аудіо й відео монтажу;
- web-редактори;
- браузери;
- банківські та бухгалтерські програми;
- настільні видавничі системи;
- ігри та інші.

Інструментальне програмне забезпечення або системи програмування - це засоби для автоматизації процесу розробки нових програм і їх супроводу за допомогою мови програмування. Для створення програми на якій-небудь мові програмування необхідно задіяти такі компоненти:
1. Текстовий редактор.
2. Компілятор або інтерпретатор для перекладу тексту.
3. Збирач, що виконує об’єднання об'єктних модулів.

XIX.Projects.

Computer games are big business. They are exported worldwide and accessed by communities of online players around the globe. For this project gather information about the most internationally popular computer games. You may try some of them yourself to see what they are all about. Summarize your ideas.

TEXTS FOR ADDITIONAL READING

I. Software updates

Software publishers regularly update their software to add new features, fix bugs, and update its security. Types of software updates (also called "upgrades"), include new versions, patches, and service packs. A software patch is a small selection of program code that replaces part of the software you currently have installed. The term "service pack", which usually applies to operating system updates, is a set of patches that correct problems and address security vulnerabilities. Software patches and service packs are usually free. It's always a good idea to install patches and services when they become available. The revised code they contain often addresses security vulnerabilities and the sooner you patch up those holes, the better.

A new version update usually installs in a similar way as you installed the original version, by activating a setup program, displaying a license agreement, and adding updated entries to your computer's Start menu. Patches and service packs are usually distributed over the Internet and automatically install themselves when you download them. To combat piracy, many software publishers require users to type in a validation code to complete an installation. The result of an update depends on several factors. Most patches and service pack installations cannot be reversed. A new version installation typically overwrites the old version, but you might have the option to keep the old version just in case you have trouble with the new one and need to revert back to the previous version.

II. 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.

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. 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.

III. Types of graphic software

Computer graphics are pictures created, changed or processed by computers. There are two categories.

1. Bitmapped graphics represent images as bitmaps; they are stored as pixels and can become a bit distorted when they are manipulated. The density of dots, known as the resolution and expressed in dots per inch, determines how sharp the image is.

2. Vector graphics represent images as mathematical formulae, so they can be changed or scaled without losing quality. They are ideal for high-resolution output.

There are different types of graphics software.

• Image manipulation programs let you edit your favourite images. For example, you can scan a picture into your PC or transfer a photo from your camera and then add different effects, or filters.

• Painting and drawing programs, also called illustration packages, offer facilities for freehand drawing, with a wide choice of pens and brushes, colours and patterns. One example is Windows Paint.

• Business graphics programs, also called presentation software, let you create pie charts, bar charts and line graphs of all kinds for slide shows and reports. You can import data from a database or spreadsheet to generate the graphs. (Spreadsheets, or worksheets, are mathematical tables which show figures in rows and columns. A spreadsheet program helps you manage personal and business finances.)

• Computer-aided design (CAD) is used by engineers and architects to design everything from cars and planes to buildings and furniture. First they make a wireframe, a drawing with edges and contour lines. Then if they want to colour the objects and add texture, they create a surface for the object; this is called ‘filling the surface’. Finally, the design is rendered to make the object look realistic. Rendering is a process that adds realism to graphics by using shading, light sources and reflections.

• Desktop publishing (DTP) is based around a page layout program, which lets you import text from a word processor, clip-art (ready-made pictures) from graphics packages, and images from scanners or cameras, and arrange them all on a page. It is used to design and publish books, newspapers, posters, advertisements, etc.

• Digital art, or computer art, is done with applets that use mathematical formulae to create beautiful bright shapes called fractals. A fractal is a geometric figure with special properties, e.g. the Koch snowflake or the Mandelbrot set. Fractals can also be used to model real objects like clouds, coastlines or landscapes.

• Computer animation uses graphics program (e.g. digital cartooning systems) to create or edit moving pictures. Each image in a sequence of images is called a 'frame'.

• Geographic information systems (GIS) allow cartographers to create detailed maps.

IV. Testing the computer program.

There are two kinds of errors or bugs with which programmers must deal. The first type is the coding error. Such errors are syntax errors that prevent the language processor from successfully translating the source program to object program code. The language processor identifies the nature and the location of the erro on the source program listing, so these errors are relatively easy to find and correct.

The second type of bug is the logic error. The computer program can be successfully translated, but the program does not produce the desired results. These erros are generally much more difficult to find and to correct than coding errors. Logic arrors can be avoided through careful planning of the program logic, but it is the programmer's responsibility to test thoroughly all of the program's functions in order to verify that the program performs according to specifications.

There are many tools provided to the programmer to help in debugging the program logic. These tools are called debug packages or tracing routines. They assist the programmer in following the logic by printing out calculation results and field values used in making logic decisions in the program. In a few cases it may be necessary to use a memory dump (роздруківка змісту пам'яті) – a printout of the instructions and data held in the computer's memory – in order to find the cause of logic errors.

UNIT 7
Operating system

I.Study the following words and collocations.

to manage	-	керувати
to allocate	-	розміщувати, локалізувати

to ensure	-	забезпечити
to leak	-	протікати, текти
to compete	-	конкурувати
multitasking	-	багатозадачність
multithreading	-	багатопотоковість
to retrieve	-	витягнути
to proceed	-	відбуватися, продовжуватися
a buffer	-	буфер
interface	-	інтерфейс
bootstrap (program)	-	завантажувальна (програма)
a core	-	ядро
to boot	-	завантажувати
kernel	-	ядро, серцевина
essential	-	суттєвий
customization	-	налаштування
to accommodate	-	пристосувати
compatibles	-	сумісності
a chat program	-	чат програма
advancement	-	прогрес, просування
consumer-oriented	-	орієнтований на споживача
folder	-	папка
to evolve	-	розвивати(ся), еволюціонувати
to undergo	-	зазнавати, витримувати

II.Read and translate the text.

Operating system

An operating system (abbreviated OS) is a master control program which controls the functions of the computer system as a whole and the running of application programs. All computers do not use the same operating systems. Some software is only designed to run under the control of specific operating systems.

Operating systems manage different tasks:

- Manage memory. OS allocates a specific area of RAM for each program that is open and running. OS is itself a program, so it requires RAM space too. When multiple programs are running, the OS must ensure that instructions and data from one area of memory do not “leak” into an area allocated to another program.
- Manage processor resources. Many activities – called “processes” – compete for the attention of your computer’s microprocessor. OS must ensure that each activity “process” receives its share of microprocessor cycles. A computer can take advantage

of performance-enhancing technologies such as multitasking, multithreading, multiprocessing, dual core or multiple processors.
- Keep track of storage resources. OS stores and retrieves files from your disks and CDs.
- Ensure that input and output proceed in an orderly manner. OS communicates with device driver software so that data can travel smoothly between the computer and these peripheral resources. OS uses 'buffers' to collect and hold data while the computer is busy with other tasks.
- Establish basic elements of the user interface. A user interface can be defined as the combination of hardware and software that helps people and computers communicate with each other.

For nearly all PCs, servers, workstations, mainframes, and supercomputers the operating system program is quite large, so most of it is stored on a hard disk. The operating system's small bootstrap program is stored in ROM and supplies the instructions needed to load the operating system's core into memory when the system boots. This core part of OS, called the kernel, provides the most essential operating system services such as memory management and file access. The kernel always stays in RAM all the time your computer is on. Other parts of OS such as customization utilities are loaded into RAM as they are needed.

One operating system might be better suited to some computing tasks than others. Operating systems are informally categorized using one or more of the following terms:
- A single-user operating system expects to deal with one set of input devices – those that can be controlled by one user only. It runs one application program at a time.
- A multiuser operating system allows a single computer to deal with simultaneous input, output, and processing requests from many users. With it you can have more than one application program or task active at a time.
- A network operating system provides communications and routing services that allow computers to share data, programs, and peripheral devices.
- A desktop operating system is designed for a personal computer. Typically, these operating systems are designed to accommodate a single user, but might also provide network capability.

The most popular operating systems are:
• ***MS-DOS***. This operating system was developed by Microsoft in 1981 for all IBM PC compatibles. Today it's only used in old PCs.
• ***Windows***. Most home PCs use Windows. Windows is the best-selling operating system. Here are the most recent versions:
- With ***Windows 98*** Internet access becomes part of the user interface. The system includes Outlook Express for e-mail, NetMeeting conferencing software, a chat program and a Web-page editor. It offers advancements such as USB and multimedia extensions.

- ***Windows XP*** is an update to all Windows versions, with a new visual design. It is the first consumer-oriented operating system produced by Microsoft to be built on the Windows NT kernel (version 5.1) and architecture.
- ***Windows Vista.*** Windows Vista is a line of operating systems developed by Microsoft for use on personal computers, including home and business desktops, laptops, Tablet PCs, and media centers.
- ***Windows Mobile*** - used on most PDAs and smart phones (PDAs which incorporate mobile phones).
• ***Mac OS.*** Large parts of the Mac OS are inside the System file and the Finder which is kept in the system folder. The content of the System file is loaded automatically at start-up and contains information which modifies the routines of the OS in the ROM chips. The Finder displays the Macintosh's desktop and enables the user to work with disks, programs and files.
• ***UNIX***, firstly, was designed to be a multi-tasking system. It has become an operating environment for software development, available for any type of machine. UNIX is the most commonly used system for advanced CAD programs.
• ***Linux*** is used as a high value, fully-functional UNIX workstation for applications ranging from Internet Servers to reliable work group computing.

Although in theory all operating systems perform very similar functions, in practice there are many different operating systems. One primary reason is the highly competitive nature of the computer industry. Operating systems, like other major computer products, evolve and undergo improvements and updates over time.

TEXT-BASED ASSIGNMENTS

III.Answer the following questions.

1. What is an operating system?
2. What does an operating system do?
3. How does an operating system manage processor resources?
4. Why does an operating system manage memory?
5. Where is the operating system stored?
6. How does the operating system affect the user interface?
7. What does an operating system use "buffers" for?
8. What is the kernel? What is its main function? Where is it located?
9. What are the differences between a single-user operating system and a multiuser operating system?
10. What are the purposes of using a network OS?
11. What is a desktop OS developed for?
12. What popular operating systems do you know?
13. What operating system is most common in personal computers nowadays?

14. What advancements does Windows 98 propose in comparison with its predecessors?
15. What is the first consumer-oriented operating system?
16. Which OS are mobile phones equipped with?
17. What types of computers is Windows Vista used on?
18. What are the main parameters of Mac OS?
19. Which OS is used for advanced CAD programs?
20. What encourages developers to create new types of operating systems?

IV.Give English equivalents to the following words and collocations.

Головна керуюча програма; працювати під керуванням певної ОС; займати певну територію; потребувати місця; ресурси процесора; конкурувати за щось; скористатися чимось; технології для підвищення продуктивності; багатопотоковість; багатозадачність; двоядерний процесор; стежити за …; діяти впорядкованому порядку; користувальницький інтерфейс; маленький завантажувач; ядро; доступ до файлу; підходити до чогось; мати справу з …; багатокористувацька операційна система; послуги маршрутизації; мережева операційна система; забезпечити можливості мережі; програмне забезпечення для проведення конференцій; мультимедіа розширення; системна папка; змінити підпрограми ОС; робоче середовище для розробки програмного забезпечення; завантажите програму в пам'ять.

V.Give synonyms to the words given below using the active vocabulary of the text:

to regulate; to project; to rule; to disperse; to guarantee; to challenge; care; to accept; gain; to elevate; method; acting; to accumulate; to carry on; to gather; to retain; to set up; to contact; enormous; principal; admittance; coinciding; to shelter; broadening; customer; to assimilate; binder; background; resembling; initial; to endure; progree.

VI.Give antonyms to the following words using the active vocabulary of the text:

carelessness; to give; hindrance; decrease; to spend; to retreat; to drop; to unsettle; minor; exit; to displease; asynchronous; to remove; inability; retardation; to separate; backward; secondary; retrogression.

VII.Comprehension check. True or false.

1. A computer's operating system is one of the most important "parts" of the computer hardware.

2. An operating system (OS) is a collection of software that manages computer hardware resources and provides common services for computer programs.

3. The Main Goal of Operating System is to provide the Interface between the user and the hardware.

4. Operating systems usually come preloaded on any computer you buy.

5. The term “kernel” is a technical jargon for a region of memory that holds data waiting to be transferred from one device to another.

6. It isn’t possible to upgrade or even change operating systems.

7. As hard disk is a non volatile memory, OS isn’t lost on the turn off.

8. A kernel is the central part of an operating system. It manages the operations of the computer and the hardware - most notably memory and CPU time.

9. Many operating systems provide helpful tools, called operating system utilities, that you can use to control and customize your computer equipment and work environment.

10. An operating system does not make deductive decisions on whether something will work or not. It takes the information it is given, creates commands for the appropriate device or program within the computer and then delivers those instructions.

11. The three most common operating systems for personal computers are Microsoft Windows, Mac OS X, and Linux.

12. A single-user OS is the software that allows multiple computers to communicate, share files and hardware devices with one another.

13. A network OS is a system in which only one user can access the computer system at a time. On the other hand, a multi-user operating system allows more than one user to access a computer system at one time.

14. Windows is installed on more than 80 % of the world’s personal computers.

15. Windows XP, which is built on the Windows 2000 kernel, brought a more personalized look to the desktop that made it easier for end users to scan or import images, acquire music files on the Web and transfer them to portable devices.

16. The MS-DOS from Microsoft based on the Windows CE kernel and designed to look and operate similar to desktop versions of Microsoft Windows in smartphones and mobile devices.

17. Companies and individuals choose Linux for their servers because it is secure.

18. UNIX is a popular single-user, singletasking operating system (OS) developed at Bell Labs in the early 1970s.

VIII.Fill in the blanks choosing from the variants given below.

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***

7. Windows 95 came out and even though OS/2 was more stable, its inability to … Win32 API-based programs doomed it.

a) retrieve ***b) run*** ***c) to boot*** ***d) store***

8. A multitasking OS is able to manage various processes side-by-side. Its one particular ability is the … of CPU time among the processes.

a) distributing ***b) transmitting*** ***c) sharing*** ***d) executing***

9. The kernel is a computer program that is the … of a computer's operating system, with complete control over everything in the system.

a) core ***b) block*** ***c) hardware*** ***d) buffer***

10. MS-DOS, the acronym for Microsoft Disk Operating System, is an operating system, which translates keyboard input by the user into operations the computer can … .

a) download ***b) perform*** ***c) debug*** ***d) copy***

IX.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***
master	***user***	***technologies***
desktop	***control***	***program***
graphical	***operating***	***system***
performance	***party***	***utilities***
third	***enhancing***	***interface***

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.
6. A … (such as DOS, Linux, MacOS, Solaris, Unix, and Windows) automatically runs first when a computer is switched on, and remains in the background until the computer is turned off. It commonly comes preinstalled.

X.Match the terms with their definitions.

TERMS	DEFINITIONS
Application program	1)is the core component of an operating system.
Operating system	2) is the ability of an operating system to execute different parts of a program, called threads, simultaneously.
Kernel	3) is a type of operating system (OS) that is developed and intended for use on a computer or similar machine that will only have a single user at any given time.
Multitasking	4) is a computer system with two or more central processing units, with each one sharing the common main memory as well as the peripherals.
Multithreading	5) includes special functions for connecting computers and devices into a local-area network (LAN).
Multiple processor	6) is a family of mobile operating systems developed by Microsoft for smartphones and Pocket PCs.
User interface	7) is any program designed to perform a specific function directly for the user or, in some cases, for another application program.
Utilities	8) allows a user to perform more than one computer task at a time.
Single-user OS	9) is designed to be used in personal computers.
Multiuser OS	10) is a program that performs a very specific task, usually related to managing system resources. Operating systems contain a number of them for managing disk drives, printers, and other devices.

Network OS	11) is a software program that enables the computer hardware to communicate and operate with the computer software.
Desktop OS	12) allows for multiple users to use the same computer at the same time and/or different times.
Windows Mobile OS	13) is everything designed into an information device with which a person may interact.

XI.Fill in the gaps choosing the appropriate word in brackets.

1)___ ***(computer/ application)*** software tells the operating system what to do. The operating system tells the ___ ***(device/ tool)*** drivers, they tell the ___ ***(software/ hardware),*** and it 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 it many operating systems ___ ***(provide/ schedule)*** helpful tools, called ___ ***(utilities/capabilities).***

Most ___ ***(software/ hardware)*** programs are ___ ***(fulfilled/ designed)*** to work with just one company's operating system, like just Windows (Microsoft) or just macOS (Apple). A piece of software will clearly say which operating systems it ___ ***(supports/ coordinates/ answers)*** and will get very ___ ***(helpful/ specific)*** if necessary. Software developers also often ___(***admit/ release)*** additional versions of their software that work with other operating systems. It's important to know whether your operating system is 32-bit or 64-bit. It's a common question you're asked when ___ ***(downloading/ deleting)*** software.

2) An embedded operating system is essentially a stripped ___ ***(down/ out/ up)*** operating system with a limited number of ___ ***(attributes/ features/ nuances).*** It is typically ___ ***(announced/ appointed/ designed)*** for very specific functions for controlling an electronic device. For example, all cell phones use an operating system that ___ ***(finds out/ carries on/ boots up)*** when the phone is turned ___ ***(over/ on/ about).*** It ___ ***(handles/ sends/ transmits)*** all the basic interface and features of the phone.

Embedded operating systems can either be custom written operating systems ___ ***(specific/ remote/ complicated)*** to the device or one of the myriad of general purpose operating systems that has been ___ ***(modified/ truncated/ refined)*** to run on top of the device. In the case of an embedded OS on a personal computer, this is an additional flash ___ ***(memory/ booting/ debugging)*** chip installed on a motherboard that is ___ ***(accessible/ bewildered/ hazardous)*** on boot from the PC.

3) DOS is the most commonly used PC ___ ***(operating/ maintenance/ computer)*** system. When IBM first released the IBM PC in 1981, IBM licensed DOS from Microsoft for use on the PC and called it PC-DOS. From the users' perspective, PC-DOS and the same, each providing the same ___ ***(capabilities/ skills/ talent)*** and commands.

The version of DOS ___ ***(performance/ release/ appointing)*** in 1981 was 1.0. Over the past decade, has ___ ***(bypassed/ ignored/ undergone)*** several changes. Each time the DOS ___ ***(developers/ users/ sellers)*** release a new version, they increase the version number.

Windows NT (new technology) is an operating system ___ ***(developed/ organized/ restructured)*** by Microsoft. NT is an ___ ***(enhanced/ lifted/ amusing)*** version of the popular Microsoft Windows 3.0, 3.1 programmers. NT requires a 386 ___ processor or greater and 8 Mb of RAM. NT is DOS compatible. The ___ ***(help/ advantage/ deposit)*** of using NT over Windows is that NT makes better use of the PC's memory ___ ***(organizing/ maintanence/ management)*** capabilities.

XII.Choose the appropriate words to fill in the gaps.

1) ***Here is a list of typical tasks performed by an operating system. In each case the main verb has been omitted. Fill in the blanks from the words given. More than one may be applied.***

execute, monitor, format, diagnose

A typical operating system will:
1. **…** input and output devices.
2. **…** the status of hardware devices.
3. **…** hardware interrupts.
4. **…** new disks.
5. **…** disk directories.
6. **…** disk reading and writing operations.
7. **…** disk errors.
8. **…** disk commands relating to the deletion, copying, renaming, and dumping of files.

2) Network Operating Systems

a) networking b) drivers c) support d) simplify e) features f) built-in g) connectivity h) implementation j) due to k) provide l) consumer m) consumer n) Ethernet o) capability p) enable

A modern O/S contains much **…** software designed to **…** networking of a computer. Typical O/S software includes an **…** of TCP/IP protocol stack and related **…** programs like traceroute.

This includes the necessary device **…** and other software to automatically **…** a device's **…** interface. Mobile devices also normally **…** the programs needed to enable Wi-Fi, Bluetooth, or other wireless **... .**

Early versions of Microsoft Windows did not provide any **…** for computer networking.

Microsoft added basic networking **…** into its operating system starting with Windows 95 and Windows for Workgroups. Microsoft also introduced its Internet Connection Sharing (ICS) **…** in Windows 98 Second Edition (Win98 SE), Windows HomeGroup for home **…** in Windows 7, and so on. Nearly any **…** O/S today qualifies as a network operating system **…** the popularity of the Internet and home networking.

3) a) scheduling b) loaded c) kernel d) approach e) responsible
f) instructions g) support h) access j) run k) ancillary
l) limited m) components n) embedded o) complex p) relies

The … is the core of an operating system. It is the software **…** for running programs and providing secure **…** to the machine's hardware. Since there are many programs and resources are **…**, the kernel also decides when and how long a program should **….** This is called **…** . Accessing the hardware directly can be very **…**, since there are many different hardware designs for the same type of **…** . The kernel **…** upon software drivers that translate the generic command into **…** specific to that device.

An operating system kernel is not strictly needed to run a computer. Programs can be directly **…** and executed on the "bare metal" machine, provided that the authors of those programs are willing to do without any hardware abstraction or operating system **….** This was the normal operating method of many early computers. Eventually, small **…** programs such as program loaders and debuggers were typically loaded from read-only memory. The "bare metal" **…** is still used today on many video game consoles and **…** systems, but in general, newer systems use kernels and operating systems.

XIII.Form the necessary parts of speech from the words in brackets to fill in the gaps.

1)Not all computers have operating systems. The computer that … ***(control)*** the microwave oven in your kitchen, for example, doesn't need an operating system. It has one set of tasks to … ***(performance),*** very straightforward input to … ***(expectance)*** and … ***(simplicity),*** never-changing hardware to control. The computer in a microwave oven simply runs a single hard-wired program all the time.

All desktop computers have operating systems. The most common are the Windows family of operating systems … ***(development)*** by Microsoft, the Macintosh operating systems … ***(development)*** by Apple and the UNIX family of operating systems. There are hundreds of other operating systems … ***(availability)*** for special-purpose … ***(to apply),*** including … ***(to specialize)*** for mainframes, robotics, … ***(to manufacture)***, real-time control systems and so on.

In any device that has an operating system, there's usually a way to make … ***(changeable)*** to how the device works. For a desktop computer user, this means you can … ***(additional)*** a new … ***(secure)*** update, system patch, new application or even an entirely new operating system.

2)One of the most … ***(to overlook)*** features on computers today is the built in … ***(able)*** to … ***(automatic)*** update software. Keeping your operating system up-to-date is … ***(vitality)*** for a healthy computer in todays … ***(environmental).*** Software … ***(to manufacture)*** are constantly … ***(fixation)*** software bugs, updating … ***(to drive)*** for new devices and making … ***(to improve)*** on the software that you use everyday. Most of the time an up-to-date operating system will improve the … ***(reliable),*** security and speed of your computer … ***(great).*** Not to mention that new iPod or iTouch you just got, won't work with Widows XP Sevice Pack 2. It’s as easy as if you are running a Windows … ***(to base)*** machine. Choose an appropriate time of day to check the Microsoft site for software updates. You may have to … ***(authentication)*** your … ***(installer)*** of Windows. Just follow the on screen instructions. Its pretty painless.

If you are running Mac OS X on an Apple Computer, you should turn the Automatic Update on by going to the "Apple Menu" (icon of an apple at the top left of your screen) and … ***(selective)*** Software Update. Under the Scheduled Check tab make sure that both Check for Updates and Download Updates Automatically are both … ***(selection).*** Then schedule your automatic updates for an appropriate time.

XIV.Translate from Ukrainian into English.

1) Види операційних систем

Операційна система розробляється під набір команд процесорів конкретного сімейства. Приклади операційних систем: Windows XP / 2003, Windows 7/8, Linux для комп'ютерів з процесорами корпорації Intel і сумісними з ними (що мають аналогічний набір команд); операційна система MacOS для комп'ютера Apple Macintosh; операційна система Solaris для комп'ютерів компанії Sun; операційна система IBM S / 390 для суперкомп'ютерів. У мобільних пристроях використовуються операційні системи Android, iOS і ін.

Найпопулярнішими операційними системами для персональних комп'ютерів є версії Microsoft Windows, для яких розроблено багато прикладних

програм. Графічний інтерфейс підтримує багатозадачність, управління віртуальною пам'яттю, можливість підключати різноманітні периферійні пристрої та працювати в комп'ютерній мережі.

Мережева операційна система UNIX використовується для дуже широкого кола апаратних платформ, практично для будь-яких комп'ютерів різних виробників, від персональних і до найпотужніших суперкомп'ютерів. Це не тільки багатозадачна операційна система, але і розрахована на багато користувачів, що дозволяє кільком користувачам розділяти обчислювальні ресурси комп'ютера, підключаючись через термінали до суперкомп'ютера (мейнфреймів).

Операційна система Linux для персональних комп'ютерів (виконана співробітником Університету Гельсінкі Т. Лінусом) поширюється вільно, економічна, підтримує більшість властивостей, притаманних іншим реалізаціям UNIX.

2) Вбудовані операційні системи - операційні системи (ОС), призначені для управління спеціалізованими пристроями і внаслідок цього здатні працювати в умовах обмежених ресурсів (малі обсяги пам'яті, недолік обчислювальних потужностей і т.п.) і в необслуживаемом режимі. Характерними особливостями вбудованих ОС є модульна структура, компактність, продуктивність, масштабованість і підвищена відмовостійкість. До них належать керуючі програми для різноманітних мікропроцесорних систем, які використовують у військовій техніці, системах побутової електроніки, смарт-картах та інших пристроях. До таких систем ставлять особливі вимоги: розміщення в малому обсязі пам’яті, підтримка спеціалізованих засобів введення-виведення. Часто вбудовані ОС розробляються під конкретний пристрій; до універсальних систем належать Embedded Linux та Windows CE.

Windows CE - популярна вбудована операційна система від фірми Microsoft, що застосовується для 32-х бітових процесорів з MMU (Memory Management Unit). Часто використовується в мобільних і портативних пристроях з графічним інтерфейсом користувача. Однією з переваг є наявність великої кількості сторонніх комерційних додатків і бібліотек, розроблених для даної платформи, а також перенені популярні додатки Word, Excel, Macromedia Flash Player.

Embedded Linux – це спеціалізована версія ОС GNU/Linux, яка адаптована для застосування в промислових пристроях, безпілотных літаючих апаратах, DVR та інших спеціалізованих засобах. Особливістю цієї модифікації є невисокі вимоги до ресурсів апаратної платформи та высокий ступінь оптимізації коду під конкретну апаратну платформу. Embedded Linux - повноцінна ОС, сучасна і фунціональна, безпечна, а головне, безкоштовна, її підтримують багато вільних розробників у всьому світі.

TEXTS FOR ADDITIONAL READING

I. 3 Current Real-Time Operating System Trends

Real-time operating systems have been in use since the ‘80s but recently have gained popularity. As such, they have become increasingly connected, event-driven and complex by using progressive peripherals and middleware stacks that require parallel management. The alternative to RTOS usage is implementing an execution control that relies on logic and custom states. Maintaining this can be intricate and error-prone for complex applications. Several trends are emerging in real-time operating system usage:

1. Efficiency

The real-time operating system is designed to implement duties more efficiently compared to traditional super-loop designs. This is because tasks executed through an RTOS do not waste processor time when waiting for activation and their response time tends to be faster because of preemptive scheduling and interrupt service routines. Additionally, microcontrollers feature 32-bit cores with substantial RAM and flash memory. This makes RTOS footprints less problematic.

2. Freely available and Open Source RTOSs

Freely available and open source real-time operating systems are increasingly popular. This has led to the emergence of larger and more informed user communities who understand the different RTOS-based designs available on the market. The community is viewed as a critical mass that helps developers improve RTOS quality and functionality.

The real-time operating system is most commonly used among embedded applications. In fact, MCU vendors include a RTOS in their software development packages. This move emphasizes how essential RTOS has become.

3. The Outsourced RTOS

Due to the complexity of real-time operating systems many people (including tech savvy individuals) do not easily comprehend how an RTOS works. They must study the operating system, understand its features and how they correlate for smooth functionality. For this reason, the use of in-house operating system solutions is decreasing in favor of leading RTOS providers. The argument is that companies specializing in RTOSs understand the systems, know how to protect them from attacks, and are managed by professionals.

II. Mobile operaring systems

Gone are the days when mobile phones were just a device to make phone calls and send occasional texts. Modern smartphones are closer to handheld computers that enable us to send emails, play games, watch the news and make video calls to loved ones. And much more besides.

Operating systems, also known as mobile OS, are the software that run our desktop computers and laptops and manage their resources and memory when they're being used for multi-tasking. But for some time now, smartphones have used operating systems too and it's this development that has brought advanced functions to mobiles that were previously only available on our computers. There are a few examples of mobile device operating systems that include Apple iOS, Google Android, and Microsoft's Windows Phone OS.

Because smartphone operating systems are so integrated with the look, feel and function of a mobile phone, many people base their choice of device around which operating system it uses. Some mobile operating systems are open source software, which means there are no restrictions on what you can download on it, or who can develop its software (there are often a 'community' of developers). Open-source operating systems are entirely customisable, whilst others are restricted in the types of software permitted to run on the device.

Here's a mobile operating systems list:

1)The Apple iOS multi-touch, multi-tasking operating system is what runs the Apple's iPhone, iPad, and iPod. iOS responds to the user's touch - allowing you to tap on the screen to open a program, pinch your fingers together to minimise or enlarge an image, or swipe your finger across the screen to change pages.

You can download millions of applications currently available on the App Store directly to any device running iOS, be it an iPhone or an iPad. These encompass everything from recipe books to guitar tuitorials to games.

2)Android OS is owned by Google and powered by the Linux kernel, which can be found on a wide range of devices. Android is an open source operating system which allows developers to access unlocked hardware and develop new programs as they wish.

Android is currently the dominant smartphone platform due to its tremendous traction with a wide spectrum of users. Some of the best features of Android include the ability to customise multiple homescreens with useful widgets and apps that give you quicker, easier access to the content and functions you most care about. It also has an excellent capacity for multitasking - with the ability to close programs by simply swiping them away.

3)Windows phone 8 smartphone operating systems. Microsoft released a hugely revamped version of its Windows platform for mobiles in late 2010, after its software fell behind iOS and Android. Redesigned and rebuilt from the ground up with a greater emphasis on the user experience, the result was an operating system called Windows Phone.

Window Phone is recognisable from its tile-based interface - dubbed Metro - which features removable and interchangeable squares sections on the home screen, each with its own purpose and function. It also has aggregators called 'hubs', that group together all photos from all applications, or all music into one library, meaning your Facebook photos can be found with your camera photos and your documents from different sources grouped together in one, easy to access location.

Windows Phone comes with a mobile-optimised version of the Internet Explorer for accessing the web, and Exchange, which supports secure corporate e-mail accounts with push support.

UNIT 8
Programming a computer

I. Study the following words and collocations.

operating code	-	діючий код
smart	-	розумний -
compiler	-	компілятор
to solve	-	вирішувати
clearly	-	чітко
straightforward	-	прямий
time-consuming	-	трудомісткий
coherent	-	узгоджений, зв’язаний, послідовний
to implement	-	реалізувати
imperative	-	наказовий, імперативний
to assume	-	припустити
to maintain	-	підтримувати
environment	-	середовище
crucial	-	вирішальний
to resemble	-	нагадувати
disadvantages	-	недоліки
semantics	-	семантика, зміст
to prove	-	довести
debugging	-	налагодження, відлагоджувати
declarative	-	декларативний, розповідний
assertions	-	твердження
query	-	запит
deductions	-	висновки

validity	-	дійсність, чинність
to permit	-	дозволяти, допускати
assignment	-	присвоєння, розподіл
sequential	-	послідовний
to handle	-	обробляти
entities	-	суб'єкти
to inherit	-	наслідувати
to derive	-	походити, успадкувати
inheritance	-	успадкування, спадщина
to exhibit	-	показувати, демонструвати
behavior	-	поведінка
chief	-	головний, основний
benefit	-	користь, прибуток
source code	-	вихідний код

II. Read and translate the text.

Programming a computer

Computer programming is the preparation and writing of detailed instructions for a computer. A computer cannot work directly with a program written in a programming language. The instructions must be translated into a machine language composed of binary digits. These digits represent operating codes, memory addresses, and various symbols, such as plus and minus signs. Machine language is also known as low-level language. Computers appear to work directly with programs written in programming languages. But actually, the smart program, such as compilers and assemblers, first translates the written program into machine language. The smart program next enters the translated version into the computer's memory. The microprocessor then reads and executes each translated instruction. The compiler can convert the human written code in the machine language directly. But the assembler can't do this at once. It converts a source code to an object code first then it converts the object code to the machine language with the help of the linker programs. Compiled programs are permanently translated into machine language. Other programs are translated each time the program is run, requiring another type of program, called an interpreter. The interpreter transforms the high-level program into an intermediate language that it then executes, or it could parse the high-level source code and then performs the commands directly, which is done line by line or statement by statement.

The computer is a machine that only carries out the procedures which the programmer gives it. A computer can’t solve any problem itself. It is the programmer who solves the problems. There are a few steps that one has to follow in problem solving:

Step 1. The programmer must define the problem clearly. This means that he or she has to determine, in a general way, how to solve it.

Step 2. The programmer must formulate an algorithm, which is a straightforward sequence of steps of instructions used to solve the problem. Constructing an algorithm is the most important part of problem solving and is usually time-consuming. An algorithm can be described by a flowchart or a block diagram.

Step 3. The programmer must translate the algorithm or flowchart into a computer program. To do so, he or she writes detailed instructions for the computer, using one of the many computer languages available following the exact sequence of the flowchart algorithm.

Step 4. The program must then be entered by a programmer or an operator into the computer.

Step 5. The program must then be tested.

Step 6. The last step is to add the data to the program and run job completely. The computer will perform the calculations necessary to solve the problem

Programing paradigm is a particular way of looking at a programming problem defining how the user conceptualizes and interprets complex problems. It is also a fundamental style or the logical approach to programming a computer based on a mathematical theory or a coherent set of principles used in software engineering to implement a programming language.

There are currently 27 paradigms existing in the world. Most of them are of similar concepts extending from the main programming paradigms: the imperative paradigm, the functional paradigm, the logical paradigm, the object-oriented paradigm. Each paradigm supports a set of concepts that makes it the best for a certain kind of problem.

The imperative programming paradigm assumes that the computer can maintain through environments of variables and changes in a computation process. Computations are performed through a guided sequence of steps, in which these variables are referred to or changed. The order of the steps is crucial, because a given step will have different consequences depending on the current values of variables when the step is executed. Imperative programming languages are more popular as most closely resembles the actual machine itself, so the programmer is much closer to the machine. This type of programming is quite efficient but has several disadvantages, for example, the semantics of a program can be complex to understand or prove or side effects can make debugging harder.

The logical programming paradigm takes a declarative approach to problem-solving. Various logical assertions about a situation are made, establishing all known facts. Then queries are made. The role of the computer becomes maintaining data and logical deduction. The system solves the problem, so the programming steps themselves are kept to a minimum and proving the validity of a given program is simple.

The functional programming paradigm views all subprograms as functions in the mathematical sense. Functional languages permit functional solutions to problems by permitting a programmer to treat functions as first-class objects (they can be treated as data assumed to have the value of what they return, therefore, they can be passed to other functions as arguments or returned from functions).

Functional programming has the high level of abstraction and its independence on assignment operations allows programs to be evaluated in many different orders. Though, problems involving many variables or a lot of sequential activity are sometimes easier to handle imperatively or with object-oriented programming.

Object Oriented Programming (OOP) is a paradigm in which real-world objects are each viewed as separate entities having their own state which is modified only by built in procedures, called methods. Because objects operate independently, they are encapsulated into modules which contain both local environments and methods. Communication with an object is done by message passing. Objects are organized into classes, from which they inherit methods and equivalent variables. A new class may be derived from another class by a mechanism called inheritance when the derived class inherits all the features of the base class and in addition, may contain additional state and may exhibit additional behavior. Inheritance gives OOP its chief benefit over other programming paradigms - relatively easy code reuse and extension without the need to change existing source code.

III. Answer the following questions to the text.

1. Why is it necessary to program a computer?
2. What is the essence of programming?
3. Why should smart programs be applied when computers are running?
4. What smart programs do you know?
5. What is the difference between the compiler and the assembler?
6. How does the interpreter function?
7. What are the main recommended steps for a programmer to solve a problem?
8. Give the definition of the term “programming paradigm”.
9. Which programming paradigms are actively used nowadays?
10. What does imperative programming assume?
11. What approach underlies logical programming?
12. What is the essence of logical programming?
13. What are the main characteristics of functional programming?
14. What is object-oriented programming?
15. What advantages does OOP have in comparison with other programming paradigms?

IV. Find in the text English equivalents for the following words and collocations.

Працювати безпосередньо з програмою, написаний на мові програмування, переведено на машинну мову, складатися з бінарних цифр, представляти операційні коди, адреси пам'яті, мова низького рівня; здається, що комп'ютер працює безпосередньо з програмами; компілятор; асемблер; розумна програма; вносити перекладений варіант у пам'ять комп'ютера; приймати базові інструкції комп'ютера; виконувати послідовно; вирішувати проблему; чітко визначити проблему; сформулювати алгоритм; трудомісткий; блок-схема; діаграма; дотримуватися точної послідовності алгоритму блок-схеми; додавати дані до програми; виконувати завдання повністю; концептуалізувати та інтерпретувати складні проблеми; підхід до програмування; узгоджений набір принципів; середовища змінних та змін; процес обчислення; вирішальний; мати різні наслідки; поточні значення змінних; нагадувати фактичну машину; мати недоліки; ускладнювати налагодження; логічне твердження про ситуацію; запити; логічний висновок; надати чинності програмі; дозволити функціональне рішення; розглядати функції як об'єкти першого класу; незалежність від операцій розподілу; залучити багато змінних; послідовна активність; реальні об'єкти; парадигма; розглядати як окремі об'єкти; вбудовані процедури; проходження повідомлення; наслідувати методи; похідний клас; містити додатковий стан; демонструвати додаткову поведінку; повторне використання коду; головна користь.

V.Match synonyms from two columns and find synonyms to them in the text.

A:	**B:**	**A:**	**B:**
arrangement	variant;	labour intensive	precise;
to consist	descent;	definite	to depict;
to show	favour;	to check	to understand;
location	present;	to decode	to mirror;
figure	results;	connected	sign;
to seem	operose;	to assist	to register;
to record	to presume;	to accept	stably;
model	similar;	decisive	to fulfil;
to accomplish	to contain;	outcomes	manners;
constantly	groundwork;	circulating	place;
obviously	to turn out;	to duplicate	claim;
drawback	impediments;	to originate	associated;
actions	to examine;	affirmation	to arise;
autonomy	to promote;	isolated	self-rule;
accession	urgent;	alike	comprehensibly.

VI.Give antonyms to the words below using the active vocabulary of the text:

brief, to vanish, foolish, to delete, temporarily, withhold, to abandon, effortless, insignificant, imprecise, partially, different, to contradict, to neglect, trivial, obsolete, despised, to differ, hindrance, to disprove, nullity, attached, harm.

VII. Match the terms with their definitions.

TERMS	DEFINITIONS
Programming language	1)a computer programming language that is closer to machine language than to human language.
Operating code	2) the process of finding and fixing software coding errors.
Low-level language	3)a type of computer programs that interprets software programs written in assembly language into machine language.
Compiler	4) a style, or “way,” of programming.
Assembler	5) a style of programming which models computations as the evaluation of expressions.
Interpreter	6) a set of steps or documentation that includes information on how to operate, perform, or otherwise maintain particular computer software or hardware.
Algorithm	7) a programming paradigm that uses statements that change a program's state.
Flowchart	8) a program that can analyze and execute a program line by line.
Computer instruction	9) a programming methodology based on objects instead of just functions and procedures.
Programmer	10) a formal language that specifies a set of instructions that can be used to produce various kinds of output.
Programming paradigm	11) a type of programming paradigm which is largely based on formal logic.
Imperative programming	12) a person who writes code for computer programs.
Debugging	13) a procedure or formula for solving a problem, based on conducting a sequence of specified actions.
Logical programming	14) the set of operations in a computer.
Functional programming	15) a special program that processes statements written in a particular programming language and turns them into machine language or "code".
Object-oriented programming	16) graphical representation of a computer program in relation to its sequence of functions.

VIII. Write in the missing words in each of the following sentences.

I.

a) dramatic b) low-level c) suitable d) detailed e) sequential
f) compiled g) independent h) complicated i) complete
j) smart k) value l) executed; m) declarative n) code o) executable

1. The aim of instructions is to give the computer ... operations to use in order to perform data.
2. Machine language permanently translates ... programs.
3. A variable can take on many … during program execution, but you must make sure that they are given an initial value,
4. ... description is necessary to start working with a program.
5. The growth of the computer power resulted in … growing computer programs.
6. The code is actually … by the computer, not easily readable by the programmer.
7. Some high-level programming languages enable to solve ... scientific problems.
8. BASIC is ... for writing relatively simple programs for PC's.
9. Before variables can be used in a program, they must be declared in a … statement.
10. By an object we mean an ... section of code carrying out a particular function.
11. A program consists of ... instructions for a computer.
12. The function of a ... program is to translate the written program into a machine language.
13. A machine language is considered to be a ... language.
14. After the … for a program has been written by one or more humans in a programming language (e.g., C or C++), it is compiled (i.e., converted) into machine code by a specialized program called a compiler.
15. This machine code is then stored as an … file (i.e., a ready-to-run program) and can be executed (i.e., run) by the operating system.

II.

a) machine code b) source code c) compiler d) application program
e) linkage editor f) object program g) load module h) object module
i) functional programming j) objects

1. A .... is a program written in one of the high-level languages.
2. A program written in a high-level language must be interpreted into ... .
3. A program designed to perform a specific task is called an ... .
4. The ... or ... is the program produced when the original program has been converted into machine code.
5. A ... is a program that converts a high-level language into machine code.
6. The system program which fetches required system routines and links them to the object module is known as the ... .

7. The ... is the program directly executable by the computer.
8. Unlike procedures that depend on a local or global state, value outputs in … depend only on the arguments passed to the function.
9. Object-oriented programming takes the view that what we really care about are the … we want to manipulate rather than the logic required to manipulate them.

IX. Match the beginning of a sentence with its ending.

I. 1) Some compilers translate high-level language into an intermediate assembly language … .
2)The purpose of programming is to find a sequence of instructions that … .
3)In computing source code is any collection of computer instructions, possibly with comments … .
4)This process can be time-consuming … .
5)The output of the assembler program is called the object code or object program ….
6)In general, the programmer's job is to convert problem solutions … .
7)Various logical assertions about a situation are made … .
8)Functional languages are created … .

II.

a) based on the functional paradigm.
b) if the program is long.
c) which is then translated (assembled) into machine code by an assembly program or assembler.
d) relative to the input source program.
e) into instructions for the computer.
f) will automate performing a specific task or solving a given problem.
g) establishing all known facts.
h) written using a human-readable programming language, usually as a plain text.

X. Choose the right words among the proposed options.

1.Data abstraction is a programming technique that … on the separation of interface and implementation.

refuses ***relies*** ***substitutes*** ***sets up***

2. The lists of instructions that you will write are computer programs, and the stuff that these instructions manipulate are different types of …, e.g., numbers, words, graphics, etc.

objects ***features*** ***characteristics*** ***aims***

3. One thing that you will learn quickly is that a computer is very dumb but …

talkative ***naughty*** ***obedient*** ***cheerful***

4. Programming will help you learn the importance of … of expression.

entanglement ***clarity*** ***shortness*** ***ambiguity***

5. All programs involve storing and … data.

combining ***unraveling*** ***investigating*** ***manipulating***

6. … programming is a programming language model organized around objects rather than "actions" and data rather than logic.

Functional ***Declarative*** ***Object-oriented*** ***Imperative***

7. Developing a program involves steps similar to any problem-… task.

solving ***creating*** ***describing*** ***setting***

8. Two common ways of planning the solution to a problem are to draw a … and to write pseudocode, or possibly both.

picture ***masterpiece*** ***charade*** ***flowchart***

9. Programmers usually use a text editor, which is somewhat like a word … program, to create a file that contains the program.

writing ***changing*** ***processing*** ***deleting***

10.The process of … high-level programming into machine language is known as compilation.

sending ***converting*** ***adding*** ***programming***

11. The computer only understands program written in 0's and 1's in binary, called the machine … .

configuration ***feature*** ***code*** ***parameter***

12. The interpreter reads each statement of code and then converts or executes it … .

later ***with delay*** ***directly*** ***leisurely***

13.In contrast, an assembler or a compiler converts a high-level source code into native (compiled) code that can be executed directly by the … system.

inherited ***declarative*** ***operating*** ***actual***

14. … programming is instructing a program on what needs to be done instead of telling it how to do it.

Modular ***Imperative*** ***Declarative*** ***Functional***

15.Basically, writing software involves describing processes, procedures; it involves the … of algorithms.

announcing ***authoring*** ***searching*** ***ablolishing***

XI.Choose the appropriate words in brackets.

A C source program consists of … ***(statements/ refrains/ tales)*** and comment lines. Comment lines are … ***(crossed out/ corrected/ enclosed)*** by the … ***(characters/ configurations/ drafts)*** /* (at the start of the comment) and */ (at the end of the comment).

Every C program must have a function called “main” which must … ***(appear/ interrupt/ attend)*** only once in a program. The parentheses following the word “main”

must be present, but there must be no … ***(peculiarities/ parameters/ exceptions)*** included. The main part of the program is enclosed within braces { }, and consists … ***(of/ in/ down)*** declaration statements, assignment statements, and other C … ***(possibilities/ functions/ lineaments).***

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 … ***(compilation/ compilator/ compiler)*** where an instruction ends. Free form means that statements can be identified and blank lines … ***(inserted/ removed/ bent)*** in the source file to … ***(transfer/ improve/ exclude)*** readability, and statements can … ***(erase/ reorganize/ span)*** several lines. However, each statement must be … ***(decorated/ terminated/ expanded)*** with a semicolon. If you forget to include the semicolon, the compiler will produce an … ***(illumination/ error/ drawing)***, indicating the next line as the … **(*source/ fountain/ oasis)*** of the error. This can … ***(grant/ cause/ dispense)*** some confusion, as the statement objected to can be correct, yet as a syntax error is produced.

A variable is a quantity that is … ***(referred/ evaluated/ equipped*)** to be name, such as a, b, c, d. A variable can take … ***(out/ down/ on)*** many values during program … ***(execution/ design/ refining)*** , but you must make … ***(fun/ sure/ room)*** 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/ underlined/ forgotten)*** in a type of declaration statement.

XII.Find and learn Ukrainian equivalents for the following words and expressions:

1) constraint programming;
2) discrete synchronous programming ;
3) object code, object program;
4) concurrent processes;
5) step-by-step approach;
6) external event;
7) assembly language;
8) source code ;
9) a program that works with abstract data types;
10) low-level programming;
11) vulnerable to errors;
12) convert the source code;
13) convert the source code programs in object modules;
14) reacting problems (changing their behavior in response to specific situations);
15) evaluation function without storing the status of network protocols.

XIII.Form the necessary part of speech from the words given in brackets.

1)Functional programming is a style of … ***(to program)*** that … ***(emphasis***) the evaluation of … ***(to express)*** rather than the … ***(executable)*** of commands. This means that a program, … ***(to write***) in a … ***(function)*** programming language, consists of a set function definitions and an … ***(expressible),*** whose value is output as the program's result. There are no side results (like an assignment) to expression … ***(evaluative),*** so an expression will always … ***(evaluation)*** to the same value, if its evaluation terminates. Because of this, an expression can always be replaced by its value without … ***(changeable)*** the overall result. This is called referential transparency.

(Purify) functional languages … ***(achievements)*** referential transparency by … ***(to forbid)*** assignment to global variables. Each expression is a constant or a function … ***(applicable)*** whose evaluation has no side effect, it only returns a value and that value … ***(dependence)*** only on the definition of the function and the values of its … ***(argumentative).***

2)A module, in ***modular programming***, is a series of functions (or procedures) that are … ***(relationship)*** in some way. This way of … ***(programmer)*** is used in many applications.

Given a problem, you begin with analysis of the problem. You carefully look at the … ***(to require)*** of the problem and you make sure all … ***(questionary)*** are answered before you begin with … ***(designer)*** of the modules. Then, you break the problem in subproblems. Each of these problems you … ***(solution)*** in one or more modules. All the … ***(to modulate)*** together solve the … ***(completion)*** problem. Modules itself may be … ***(divisible)*** into smaller modules.

A module is a set of … ***(functional)*** that are related to each other. For example, a module called "Driving" … ***(container)*** the functions drive (brand_of_car), accelerate (speed) and stop () . A modulair program is always more clearly than a pure functional program because the different modules are … ***(classificator)*** on base of … ***(relevant).***

3) The difference between OOP and functional and modular programming, is that the objects in OOP only … ***(manipulation)*** their own condition. The condition of all the objects together … ***(specific)*** the condition of the complete … ***(programmable).*** An object oriented program is always easier to read than a … ***(modulation)*** program, because all the objects … ***(representation)*** their information. The way an OO program works can be … ***(definition***) by drawing the relations between the objects. That is exactly why it is always a good idea to … ***(drawing)*** a data model with the objects, and their relations, you need.

Besides that, an OO program is easier to … ***(maintenance)***, because changing the functionality of an object will (usually) have no … ***(effective)*** on the state of other

objects. For … ***(to implement)*** new functionality, it might be enough to simply add one or more objects to the … ***(to apply)*** and … ***(definition)*** their relations.

XIV.Replace the underlined words with their synonyms.

Object Oriented Programming (or OOP) is a revolutionary ***concept*** that changed the rules in computer program ***development***. OOP is organized around objects rather than actions. Normally, a program has a simple flow: input data, ***process*** the data and output a result. OOP has a different view; what we really care about are the objects we want to ***manipulate,*** not the logic ***required*** to manipulate them. Examples of such objects can be human beings (for example, described by name, address and so on), or buildings and floors (whose properties can be described and ***managed***) or even little things, like a button or a toolbar. In an object oriented program, the modules are classes rather then procedures. A class is a ***collection*** of objects.

An object is actually a ***container*** filled with ***information.*** An object ***contains*** code and data. Code are sequences of computer instructions, and data is information on which the instructions ***operate.*** In C ++ units code are called functions and units of data are called structures. Functions and structures are not ***connected*** to each other. For example, a function can operate on more than one structure, and a structure can be used in more than one function.

All the ***communication*** between objects, is done by messages. The object, to which the message is sent, is the receiver of the message. Messages ***define*** the interface of the object. At least everything an object can do ***is represented*** by his messages.

An object is defined by his class. A class determines everything about the object. Objects are individual ***instances*** of a class. The action that the message ***carries out*** is called a method. This is, in fact, the code that's getting ***executed*** when the message is ***received*** by an object.

Data modeling is a first step in ***designing*** an object oriented program. A simple approach to ***creating*** a data model that ***allows*** you to visualize the model, is to draw a square to represent each individual data item that you know about, and then to ***express*** relationships between each of these data items. With this data model, you can easily create a set of classes or even a ***complete*** program, because this data model defines the working of the program.

XV.Transate from Ukrainian into English.

1) Універсальним засобом є використання двійкового (бінарного) коду, що складається з послідовностей нулів і одиниць, які сприймаються будь-яким комп'ютерним пристроєм.
2) На сучасному етапі розвитку комп'ютерних технологій пріоритетним для багатьох програмістів є ООП та програмування на Java.

3) Вихідний текст, написаний розробником на мові високого рівня, перетворюється в програму на спеціальному машинному мовою.
4) Компілятор - це програма, завдання якої – переклад понять, близьких до предметної області розробника поняття, якими здатний маніпулювати комп'ютер.
5) Веб-сторінки HTML — декларативні, оскільки вони описують, що містить сторінка та що має відображатись — заголовок, шрифт, текст, зображення — але не містить інструкцій як її слід відображати.
6) Ширша концепція функційного програмування визначає набір спільних правил та тем замість переліку відмінностей від інших парадигм.
7) Для подолання недоліків функціональних програм вже перші мови функціонального програмування включали не тільки чисто функціональні засоби, але і механізми імперативного програмування.
8) Замість того, щоб розглядати програму як набір послідовно виконуваних інструкцій, в ООП програма представляється у вигляді сукупності об’єктів.

XVI. Render in English.

I.

Імперати́вне програмува́ння — парадигма програмування, згідно з якою описується процес отримання результатів як послідовність інструкцій зміни стану програми. Подібно до того, як з допомогою наказового способу в мовознавстві перелічується послідовність дій, що необхідно виконати, імперативні програми є послідовністю операцій комп'ютера для виконання. Поширений синонім імперативному програмуванню є процедурне програмування. Імперативні мови програмування протиставляються функційним і логічним мовам програмування. Функційні мови, наприклад, Haskell, не є послідовністю інструкцій і не мають глобального стану. Логічні мови програмування, такі як Prolog, зазвичай визначають що треба обчислити, а не як це треба робити.

II.

Об'єктно - орієнтоване програмування (ООП) – це модель програмування яка базується на стверджені того, що програма це сукупність об’єктів які взаємодіють між собою. Кожен об’єкт в цій моделі є незалежним, і він здатний отримувати, обробляти дані та відправляти ці дані іншим об’єктам.

Основним поняттям ООП є об'єкт. Об'єкт можна визначити як певну сукупність даних (характеристик об'єкта) та методів роботи з ними. Для класифікації об'єктів у ООП використовують класи. Клас служить зразком для створення обєкту, тобто об'єкт є нічим іншим, ніж копією класу. Кожен об'єкт має процедури і функції (те що він уміє виконувати, наприклад, завантажувати

файл, відображати картинку і т.д.), які служать для роботи з даними об'єкта. Ці процедури і функції називаються методами.

TEXTS FOR ADDITIONAL READING

I. New algorithm repairs corrupted digital images in one step

From phone camera snapshots to lifesaving medical scans, digital images play an important role in the way humans communicate information. But digital images are subject to a range of imperfections such as blurriness, grainy noise, missing pixels and color corruption.

A group led by a University of Maryland computer scientist has designed a new algorithm that incorporates artificial neural networks to simultaneously apply a wide range of fixes to corrupted digital images. Because the algorithm can be "trained" to recognize what an ideal, uncorrupted image should look like, it is able to address multiple flaws in a single image.

The research team, which included members from the University of Bern in Switzerland, tested their algorithm by taking high-quality, uncorrupted images, purposely introducing severe degradations, then using the algorithm to repair the damage. In many cases, the algorithm outperformed competitors' techniques, very nearly returning the images to their original state.

The researchers presented their findings on December 5, 2017, at the 31st Conference on Neural Information Processing Systems in Long Beach, California.

"Traditionally, there have been tools that address each problem with an image separately. Each of these uses intuitive assumptions of what a good image looks like, but these assumptions have to be hand-coded into the algorithms," said Matthias Zwicker, the Reginald Allan Hahne Endowed E-Nnovate Professor in Computer Science at UMD and senior author of the research presentation. "Recently, artificial neural networks have been applied to address problems one by one. But our algorithm goes a step further -- it can address a wide variety of problems at the same time."

Artificial neural networks are a type of artificial intelligence algorithm inspired by the structure of the human brain. They can assemble patterns of behavior based on input data, in a process that resembles the way a human brain learns new information. For example, human brains can learn a new language through repeated exposure to words and sentences in specific contexts.

Zwicker and his colleagues can "train" their algorithm by exposing it to a large database of high-quality, uncorrupted images widely used for research with artificial neural networks. Because the algorithm can take in a large amount of data and extrapolate the complex parameters that define images -- including variations in texture, color, light, shadows and edges -- it is able to predict what an ideal, uncorrupted

image should look like. Then, it can recognize and fix deviations from these ideal parameters in a new image.

"This is the key element. The algorithm needs to be able to recognize a good image without degradations. But for an image that is already degraded, we can't know what this would look like," said Zwicker, who also has an appointment at the University of Maryland Institute for Advanced Computer Studies (UMIACS). "So instead, we first train the algorithm on a database of high-quality images. Then we can give it any image and the algorithm will modify the imperfections."

Zwicker noted that several other research groups are working along the same lines and have designed algorithms that achieve similar results. Many of the research groups noticed that if their algorithms were tasked with only removing noise (or graininess) from an image, the algorithm would automatically address many of the other imperfections as well. But Zwicker's group proposed a new theoretical explanation for this effect that leads to a very simple and effective algorithm.

"When you have a noisy image, it is randomly shifted or jittered away from a high-quality image in all possible dimensions. Other degradations, such as blurring for example, diverge from the ideal only in a subset of dimensions," Zwicker explained. "Our work revealed how fixing noise will bring all dimensions back in line, allowing us to address several types of other degradations, like blurring, at the same time."

Zwicker also said that the new algorithm, while powerful, still has room for improvement. Currently, the algorithm works well for fixing easily recognizable "low-level" structures in images, such as sharp edges. The researchers hope to push the algorithm to recognize and repair "high-level" features, including complex textures such as hair and water.

"To recognize high-level features, the algorithm needs context to understand what is in the image. For example, if there is a face in an image, it's likely that the pixels near the top are probably hair," Zwicker said. "It's like assembling a jigsaw puzzle. If you're only looking at one piece, it's hard to place that part of the image in context. But once you find where the piece belongs, it's much easier to recognize what the pixels represent. It's quite clear that this approach can be pushed much further still."

Story Source: Materials provided by University of Maryland.

II. Computer programming: Are two heads really better than one?

Texas Tech professor Miguel Aguirre-Urreta and his colleagues investigated the advantages and perceptions of pair programming from the programmer's standpoint. It seems like a simple premise -- two people on one project can do the job faster and easier and generate a better product.

Miguel Aguirre-Urreta, an assistant professor in the Area of Information Systems and Quantitative Sciences (ISQS), along with colleagues from Washburn

University in Kansas and Florida International University, researched the area of pair programming and why some programmers like it, some don't, what makes a good programming pair and at what point programmers come on board with the idea. The findings of their paper, "Effectiveness of Pair Programming Perceptions of Software Professionals," has been accepted for publication in an upcoming edition of IEEE Software magazine.

"The thought has been that pair programming has a lot of purported advantages in terms of speed, quality and whatnot," Aguirre-Urreta said. When it comes to programming, or writing code for programs, Aguirre-Urreta's research seems to show two heads could indeed be better than one. But the success of having two programmers, called pair programming, also depends on the complexity of the project and the composition of the programming pair involved.

In instances where pair programming is used, Aguirre-Urreta's research shows programmers have a more favorable view of the technique than those who have not participated in pair programming. It also shows once a programmer is involved with pair programming, his view toward the technique is more favorable than before.

Factors of success. Aguirre-Urreta said several factors are involved in determining whether or not pair programming is right for a project and what constitutes a good pairing of programmers.

Complexity of the project seems to be the first determining factor, Aguirre-Urreta said. If it is a simple project that doesn't require much time to complete, then a single programmer is likely the best solution. However, if it is a longer term project requiring a great deal or different types of code, pair programming seems to work well.

"The main advantage to pair programming would be having two people work together on the problem where you get more of a discussion between two people," Aguirre-Urreta said. "You get a better exchange of ideas. It's not a scenario where one person has a certain way of doing things or a certain approach to the problem that they can't break away from because they have someone else working with them."

In a typical pair programming situation, Aguirre-Urreta said the pair works by having one person write the code and the second person checks the quality of the code to see if it could be done better.

Pair programming, however, isn't always the best solution. For one, if the project is a small one, it would be difficult to justify having two people, and thus two salaries, working for its solution unless two people can produce quality code at a much quicker rate. Also, pairing two people means one person may have to explain his coding or work methods to the other frequently, which results in a lengthier period to produce the code.

Then there's the factor of the actual makeup of the programming pair. It all depends on the type of project, but Aguirre-Urreta said the research found that for projects in which pair programming is used as a training tool, having one programmer with a good amount of experience and another who is relatively new often produces

the best results. Often pairing two senior programmers or two junior programmers doesn't produce the same results or quality code. "If the goal is to produce good, nice working software but also train junior programmers and help develop programmers, pairing them with a senior programmer seems to work well," Aguirre-Urreta said.

Aguirre-Urreta's research discovered once programmers give pair programming a try and use it over a period of time, they eventually come around to its advantages. Once that happens, Aguirre-Urreta said, the change in perception comes quickly.

"We think it's actually the act of just doing it, being there and experiencing working with the other person," Aguirre-Urreta said. "They see that, indeed, their fears that it will take forever to get done are not really realized. They see the quality of the code is indeed better and there is a huge time-saver. Fixing code is very expensive compared to producing quality code from the get-go."

Story Source: Materials provided by Texas Tech University.

UNIT 9
Programming languages

I.Study the following words and expressions

artificial	-	штучний
keyword	-	ключове слово
low-level language	-	мова низького рівня
high-level language	-	мова високого рівня
extensive	-	великий, обширний
machine code	-	машинний код
to feed	-	завантажувати, постачати
to recognize	-	розпізнати
to debug	-	відлагоджувати
readable	-	читабельний
ancestor	-	предок, прародитель
advanced	-	просунутий, прогресивний
to handle	-	обробляти
to substitute	-	замінити
to save	-	зберегти
to modify	-	видозмінювати, модифікувати
convenient	-	зручний, придатний

to solve	-	вирішити
to apply	-	застосовувати
variables	-	змінні
paradigm	-	парадигма
enterprise	-	підприємство
compatible	-	сумісний
to consider	-	вважати, розглядати
owing to	-	завдячуючи
robust	-	надійний
to enforce	-	примушувати
strict	-	строгий, вимогливий, жорсткий
troubleshooting	-	вирішення проблем
expertise	-	спеціальні знання

III. Read and translate the text.

Programming languages

Programming language is an artificial language that has vocabulary and sets of grammatical rules to instruct a computer to perform specific tasks. Each language has a unique set of keywords (words that it understands) and a special syntax for organizing program instructions.

There are two major types of programming languages. These are low-level languages and high-level languages. Low-level languages are further divided into Machine language and Assembly language.

Low-level languages are machine oriented and require extensive knowledge of computer hardware and its configuration. Machine language is the only language that is directly understood by the computer. It does not need any translator program. Machine languages consist of numbers only. Machine language instructions, which are also called machine code, are written in binary form — i.e. strings of 1s and 0s (e.g. 01011010) — because electronic circuits inside computers, including memories, work only with the signals 0 and 1. When this sequence of codes is fed to the computer, it recognizes the codes and converts it into electrical signals needed to run it. For example, a program instruction may look like this: 10110010110100. It is not an easy language for the user to learn. It is also difficult to debug programs written in this language. Thus, programmers use languages that are readable for them but not for computers. Such a human readable language must be translated into machine language by special purpose programs called language processors.

C language is a machine level language and ancestor to many of the advanced programming languages such as C++, Java, C#, JavaScript, and Pearl.

Assembly languages were the first step to improve the programming structure. You know that computer can handle numbers and letters. Therefore, some combinations of letters can be used to substitute for numbers of machine codes. The set of symbols and letters forms the assembly language and a translator program is required to translate this language to machine language. This program is called Assembler. The symbolic programming of this language is easier to understand and saves a lot of time and effort of the programmer. It is also easier to correct errors and modify program instructions.

Programming in either assembly language or machine language is not an easy business requiring deep knowledge of computer hardware. To make the programmer's work easier more convenient, high-level languages were soon (beginning in the mid-1950s) invented. ***High-level languages*** are problem oriented because the instructions are suitable for solving a particular problem. For example, the language FORTRAN (FORmula TRANslation) was invented for solving mathematical problems. COBOL (COmmon Business Oriented Language) was developed to handle records and files and the operations necessary for simple business application. The trend since then has been toward developing increasingly abstract languages, allowing the programmer to think and communicate with the machine at a level ever more remote from machine code.

Programming languages are extremely logical and follow standard rules of mathematics. Each language has a unique method for applying these rules, especially around the areas of functions, variables, methods, and objects. Software designers and programmers decide how to use those paradigm elements. Different programming languages advocate different programming paradigms. Some languages are designed to support one particular paradigm (Smalltalk supports object-oriented programming, Haskell supports functional programming), while other programming languages support multiple paradigms (such as Object Pascal, C++, C#, Visual Basic, Common Lisp, Scheme, Perl, Python, Ruby, Oz and F Sharp).

It is very difficult to determine what are the most popular of modern programming languages. The following programming languages are among the most popular modern programming languages today.

FORTRAN acronym for FORmula TRANslation. This language is used for solving scientific and mathematical problems. It consists of algebraic formulae and English phrases. It was first introduced in the United States in 1954.

COBOL acronym for Common Business-Oriented Language. This language is used for commercial purposes. COBOL, which is written using English statements, deals with problems that do not involve a lot of mathematical calculations. It was first introduced in 1959.

ALGOL acronym for ALGOrithmic Language. Originally called IAL, which means International Algebraic Language. It is used for mathematical and scientific purposes. ALGOL was first introduced in Europe in 1960.

Java was developed by James Gosling, in 1990 at Sun Microsystems. This is the first purely object oriented programming language. It enables programmers to write computer instructions using English-based commands instead of having to write in numeric codes. Java language is used to develop enterprise level application and video games; it can be employed to develop web based applications when used with JSP (Java Server Pages). Java is a higher level language which is designed to be compatible with any operating system. It has similar syntax to C and C++.

Python is a high-level programming language and is often considered to be the easiest language to learn, owing to its simplicity, readability and straight forward syntax. Python was developed by Guido Van Rossum in 1991. Currently, some highly famous and robust sites are operating in Python including *pinterest.com, instagram.com, and rdio.com*. The code is easy to read and enforces good programming style, without being too strict about syntax (things like remembering to add a semicolon at the end of each line). The program is straightforward enough that there aren't many variable solutions to mistakes, so troubleshooting usually involves just a quick Google search for a helpful answer.

Ruby is one of the newest programming languages to be used on a widescale. It was designed in 1995 by Yukihiro Matsumoto, an employee of Heroku (a cloud platform, 2012). The code is so easy to write and read, it's no wonder this language is so often picked up before Java. Ruby is also very similar to both Perl and Python. While it is primarily object-oriented, it also has the capability of multiple paradigms, giving its users plenty of freedom to work with.

Lying above high-level languages are languages called the fourth-generation languages (usually abbreviated 4GL). ***4GLs*** are far removed from machine languages and represent the class of computer languages closest to human languages.

The choice of which language to use depends on the type of computer the program is to run on, what sort of program it is, and the expertise of the programmer.

III.Answer the following questions.

1.What is a programming language?
2. What two major types of programming languages exist?
3. What are the peculiarities of low-level languages?
4. What does the term low-level mean?
5. What are the characteristic features of machine language?
6. Why doesn't machine language need any translator program?
7. What are the characteristic features of assembly language? In what way does it differ from machine language?
8. What is the assembler?
9. What were the reasons for the invention of high-level languages?
10. What is the radical difference between high-level and low-level languages?

11. What were the languages FORTRAN and COBOL developed for?
12. What is the foundation of any programming language?
13. How was the development of programming languages progressing throughout the years?
14. What programming languages are used for scientific purposes?
15. What functions was COBOL designed for?
16. In what spheres is Java employed?
17. What capabilities does Python possess?
18. What new programming language gives a lot of opportunities to the user because of its ease in use and multiple paradigms?
19. What programming languages do you know? What are their special features?
20. What programming languages are the best to learn?

IV.Say whether the following sentences are true or false. Correct the false ones.

1. A programming language is a special coding system designed for writing instructions for a computer.
2. Low-level languages are machine-oriented, which means that they are used for solving a narrow circle of problems.
3. Low-level languages require no translator program.
4. High-level languages are used if it is not possible to solve a problem using a low-level language program.
5. High-level languages are termed so because they require high-skilled programs being very difficult for man to understand and demanding deep knowledge of computer hardware.
6. Ruby is the father of the modern programming languages. As an assembly language it was invented to provide high-level access to memory.
7. Python is an interpreted, object-oriented, high-level programming language with dynamic semantics.
8. ALGOL is used for scientific computations. It had a strong influence on other languages.
9. Java cannot be read and written easily by humans because of its complex syntax.
10. 4GLs are more like human languages and less like machine languages.

V.Find English equivalents to the words and collocations given below.

Штучна мова, набір граматичних правил, набір ключових слів, машиноорієнтована мова, спеціальні знання комп'ютерного обладнання, програма перекладач, машинний код, написаний у бінарній формі, завантажити в комп'ютер, визнавати коди, конвертувати в електричні сигнали, налагоджувати програми, читабельний, мовний процесор, найпоширеніші мови програмування,

мови асемблера, структура програмування, обробляти числа та літери, замінити числа машинного коду, виправляти помилки, змінити інструкції програми, зручний, проблемно-орієнтована мова, вирішити конкретну проблему, дотримуватися стандартних математичних правил, змінні, підтримувати різні парадигми програмування, для комерційного призначення, об'єктноорієнтована мова програмування, бути сумісним з…, завдячуючи, простота, прямий синтаксис, надійні сайти, примусити, вирішення проблем, для широкомасштабого використання, найближче до людських мов, досвід програміста.

VI.Give synonyms to the proposed words and word expressions using the active vocabulary of the text:

false, chief, broad, apprehension, single, to comprehend, interpreter, guidance, chain, to nourish, goal, forward-looking, to upgrade, to replace, assortment, emblem, to economise, endeavour, to amend, blunder, merchandising, to settle, distant, to promote, to assist, peculiar, to present, profitable, to embrace, to engage, suitable, effortless, to oblige, severe, adjacent.

VII. Give antonyms to the proposed words and word expressions using the active vocabulary of the text.

natural, common, general, minor, to rrjoin, narrow, unawareness, descendant, backward, to worsen, to waste, inconvenient, to forbid, close, deprecate, to contradict, despised, different, feeble, mild, futile, distant.

VIII.Match the specific features to the languages they characterize.

C Language Java Python

Ruby FORTRAN ALGOL

1) It is one of the newest programming languages to be used on a wide-scale.
2) It is ancestor to many of the advanced programming languages.
3) It is a family of portable programming languages for scientific computations that had a strong influence on other languages. It was introduced in 1960.
4) It requires less time, less lines of code, and less concepts to be taught to reach a given goal.
5) Coding in this language is stricter and has a steeper learning curve than other languages.
6) It is one of the most used programming languages in the world.

7) It was designed to allow easy translation of math formulas into code.
8) It is often considered to be the easiest language to learn, owing to its simplicity, readability and straight forward syntax.
9) With this language you'll be able to access and manipulate the most important computer parts like the file system, graphics, and sound for any fairly sophisticated and modern program.
10) It is used for developing low level applications.
11) One of the truly greatest perks of working with this language is that it's completely open-sourced and free.
12) There is a sense of beauty in its coding that makes this one of the best programs for beginners.
13) It is a language special developed to let the computer execute number crunching operations
14) This language is used to develop enterprise level application and video games.
15) It is regarded as combination of some of the most famous features of Lisp, Pearl and Eiffel.

IX.Complete the sentence using one word:

applications, debugging, framework,
ancestor, object, script, syntax, coding

1. Many famous websites were developed on this web development …… .
2. One of the reasons to pick up this language is that its …… is easy to understand.
3. It is more convenient to develop web based ……. in python.
4. It requires less time to write a simple …… in this language.
5. …… in Java is knowing how and why the project works.
6. This is the first purely ……. oriented programming language
7. C language is an …… to many of the advanced programming languages.
8. With the help of this language you will learn things like …… programs, memory management, and how computers work.

X.Match the terms and their definitions.

TERMS	DEFINITIONS
Compiler	1)a computer language designed to handle a particular class of problem.
Machine language	2)a set of rules or guidelines used when writing the source code for a computer program.
High-level language	3) a software program that transforms high-level source code into a low level object code (binary code) in machine language, which can be understood by the processor. The process is known as compilation.

Interpreter	4)a software program designed or used to perform tasks, such as processing program code to machine code.
Machine code	5)it transforms the high-level program into an intermediate language that it then executes, or it could parse the high-level source code and then performs the commands directly, which is done line by line or statement by statement.
Low-level language	6)a class of languages envisioned as an advancement upon third-generation programming languages (3GL).
Assembler	7)a collection of binary digits or bits that the computer reads and interprets.
Language processor	8)a programming language that provides little or no abstraction of programming concepts and is very close to writing actual machine instructions.
Problem-oriented programming language	9)is any programming language that enables development of a program in a much more user-friendly programming context and is generally independent of the computer's hardware architecture.
Object-oriented programming language	10) an executable instruction code provided by all running computer system programs and applications.
Programming style	11)a program used to convert or translate programs written in assembly code to machine code.
4GL	12) a programming Language that supports Object-Oriented Programming.

XI.Transform the words given in brackets into the necessary forms according to the content of the text.

Types of high-level languages. COBOL, FORTRAN, and their _____ ***(to descend)*** such as Pascal and C are known as imperative languages, since they _____ ***(specific)*** as a sequence of explicit commands how the machine is to go about _____ ***(to solve)*** the problem at hand; this is not very _____ ***(to differ)*** from what takes place at the machine level. Other languages are _____ ***(to function),*** in the sense that _____ ***(a programmer)*** is done by calling (i.e. invoking) functions or _____ ***(to proceed),*** which are sections of code _____ ***(to execute)*** within a program.

The best known language of this type is LISP (from List Processing), in which all _____ ***(to compute)*** is _____ ***(to express)*** as an _____ ***(to apply)*** of a function to one or more “objects”. Since LISP objects may be other functions as well as individual data items (variables, in mathematical terminology) or data structures, a programmer can _____ ***(creation)*** functions at the appropriate level of _____ ***(to abstract)*** to solve the problem at hand. This feature has made LISP a popular language for artificial _____ ***(intelligent)*** applications, although it has been somewhat _____

(to supersede) by logic programming languages as Prolog (from Programming in Logic). These are termed nonprocedural, or _____ ***(to declare)*** languages in the sense that the _____ ***(programmable)*** specifies what goals are to be _____ ***(accomplishment)*** but not how specific methods are to be applied to attain those goals. Prolog is based on the concepts of _____ ***(to resolute)*** (akin to logical deduction) and _____ ***(to unify)*** (similar to pattern matching). Programs in such languages are written as a sequence of goals. High-level languages have a major _____ ***(to advantage)*** over machine and _____ ***(assembling)*** languages that they are easy to learn and use. It is because they are similar to the languages we use in our everyday life. Their disadvantage is that they _____ ***(requirement)*** special software for translating high-level language programs into machine level programs.

XII.Complete the sentences translating their Ukrainian parts into English.

1. COBOL, FORTRAN, and their descendants such as Pascal and C are known as imperative languages, *позаяк вони вказують у вигляді явних команд, як машина має взятися за розв'язання наявної задачі*.
2. *Оскільки об'єктами LISP можуть бути інші функції, а також окремі елементи даних або структури даних*, a programmer can create functions at the appropriate level of abstractions.
3. These languages are termed nonprocedural or declarative *в тому розумінні, що програміст вказує, які цілі мають бути досягнені, а не те, як слід застосовувати конкретні методи для досягнення цих цілей.*
5. High-level languages have a major advantage over machine and assembly languages *в тому, що їх легко вчити і застосовувати.*
6. *Ще одним прикладом прикладного програмного забезпечення* is programming languages.
7. Such a human readable language *треба транслювати в машинну мову за допомогою спеціальної програми, яка називається «транслятор».*
8. The symbolic programming of assembly language *легше для розуміння та економить програмісту багато часу та зусиль.*
9. *Аби полегшити програмісту роботу* more convenient, high-level languages were soon invented.
10. *Відтоді існує тенденція, спрямована на розвиток мов дедалі більш абстрактних,* allowing the programmer to think and communicate with the machine *на рівні дедалі більш несхожому на машинний код.*

XIII. Choose the appropriate word to fill in the blanks.

I. a) managemen b) developed c) driver d) machine e) debugging f) widely g) extensions h) programming i) code j) level

k) reasons l) stricter m) education n) Java o) interface

C language was **…** by Dennis Ritchie in 1972, at Bell labs. C is one of the most **…** used programming languages. There are a few **…** for this. As famouse p

rogrammer and writer Joel Spolsky says: "C is to programming as learning basic anatomy is to a medical doctor". C is a **…** level language, so you'll learn how a program interacts with the hardware and learn the fundamentals of **…** at the lowest – hardware - **…** (C is the foundation for Linux/GNU). You learn things like … programs, memory **…**, and how computers work that you don't get from higher level languages like **…** - all while prepping you to **…** efficiently for other languages. That said, coding in C is **…** and has a steeper learning curve than other languages, and if you're not planning on working on programs that **…** with the hardware (tap into device **…**, for example, or operating system **…**), learning C which add to your **…** time, perhaps unnecessarily.

II. a) irrespective b) coding c) programming d) machine e) compile f) filesystem g) principle h) project i) run j) requires k) object l) advantage m) must n) sophisticated o) portability p) access

Java was developed by James Gosling, in 1990 at Sun Microsystems. Java is one of the most used **…** languages in the world. There is always something that can be done with Java. The special thing about Java is that this is the first purely **…** oriented programming language. Java was developed on the **…** of WORA i.e. "Write Once Run Anywhere". This feature adds to the **…** of Java. You just need to **…** Java Source code once and then on any machine where JVM (Java Virtual Machine is installed), you can **…** that code **…** of the underlying operating system and hardware.

This is a **…** learn language for every programmer. Java has the **…** of a long history of usage. You won't get **…** -level control, as you would with C, but you'll be able to **...** / manipulate the most important computer parts like the **…,** graphics, and sound for any fairly **…** and modern program - that can run on any operating system.

Developing a deep understanding of Java takes a lot of time and strenuous effort, as it **…** deep knowledge of programming and how it works on a highly nuanced level. **…** in Java isn't just following steps until you get the **…** you want to work; it's knowing how and why the project works because of a complex fundamental knowledge.

XIV. Select the right words among the proposed ones in brackets.

Python is another … ***(high-level/ narrow-profile/ high-speed)*** programming language and is often … ***(rephrased/ considered/ contrasted)*** to be the easiest language to learn, owing to its simplicity, readability and … ***(intricate/ straightforward/ ornate)*** syntax. Python wasn't used that widely in the past; however, the language has seen

great … ***(oblivion/ transformation/ popularity)*** in the recent years owing to Google's investment in the language in the past 10 years.

Like, PHP, Python also has … ***(associated/ decorated/ suppliued)*** web … ***(packing boxes/ frameworks/ shells)*** which make it more (convenient to … ***(reformat/ develop/ transcribe***) web based applications in python. Many people recommend Python as the best … ***(beginner/ singer/ graduate)*** language because of its simplicity yet great … ***(capabilities/ skills/ experience)***. The code is easy to read and … ***(attenuate/ enforces/ conceal)*** good programming style, without being too strict about syntax (things like remembering to add a semicolon at the end of each line).

Python is an absolute … ***(maybe/ why not/ must)*** for beginners who want to get their feet wet with Linux (or are already … ***(distributed/ developed/ familiar)*** with Linux). One of the truly greatest … ***(purchases/ perks/ breakages)*** of working with Python is that it's completely open-sourced and free. If you have access to a computer, you can … ***(feasibly/ impossibly/ heavily)*** learn Python. What's even better is that it has a great online … ***(staff/ community/ atmosphere)*** that offers scores of … ***(actors/ translators/ tutorials)*** and other learning tools. The program is straightforward enough that there aren't many variable … ***(solutions/ transfers/ sendings)*** to mistakes, so … ***(creating/ troubleshooting/ installation)*** usually involves just a quick Google search for a helpful answer.

XV. Match the beginning of a sentence with its ending.

I.

1.Ruby is one of the newest programming languages …
2.Ruby powers Ruby on Rails, a web development framework …
3.It is a framework …
4.Ruby also has got a good job market and …
5.One of the best reasons to pick up Ruby as a first language …
6.When compared to some other programming syntax, like C, …
7.There is a sense of beauty in the coding of Ruby …
8.The code is so easy to write and read, …
9.Ruby is also very similar to both Perl and Python, …
10.While it is primarily object-oriented, …

II.

a) for building Web application based on that language.
b) it also has the capability of multiple paradigms, giving its users plenty of freedom to work with.
c) Ruby seems almost intuitive with the logical and semantic approaches it takes.
d) to be used on a widescale.
e) on which numerous famous websites including Github, Scribd, Yammer, Shopify, and Groupon have been developed.

f) ruby developers are being paid decently at the moment.
g) that makes this one of the best programs for beginners.
h) so a jump to either of those two languages are nearly seamless.
i) is that its syntax is one of the absolute easiest for beginners to understand.
j) it's no wonder this language is so often picked up before Java.

XVI.Insert the necessary words using professional vocabulary.

A programming language is a formal **…** that specifies a **…** of instructions that can be used to **…** various kinds of output. **…** languages generally consist of **…** for a computer. Programming languages can be used to **…** programs that **…** specific algorithms.

The earliest known programmable **…** that preceded the **…** of the digital **…** was the automatic flute player described in the 9th century by the brothers Musa in Baghdad, during the Islamic Golden Age. Thousands of different programming languages have been **…**, mainly in the computer **…**, and many more still are being created every year. Many programming languages **…** computation to be specified in an imperative form (i.e., as a sequence of **…** to perform) while other languages use other forms of program **…** such as the declarative form (i.e. the desired result is specified, not how to achieve it).

The description of a programming language is usually **…** into two components of syntax (form) and semantics (**…**). Some languages are **…** by a specification document (for example, the C **…** language is specified by an ISO Standard) while other languages (such as Perl) have a dominant implementation that is treated as a reference. Some languages have both, with the basic language defined by a standard and extensions taken from the **…** implementation being common.

XVII.Using the Internet and the information from the text, decide which languages would be best for these users and tasks.

1. A language for school pupils learning to program for the first time.
2. A language for professional programmers who want their software to run on any type of computer system.
3. A language for a student who wants to create his own webpage.
4. A language for a website designer who wants to include simple animation in site.
5. A language for computing students who want to write a general purpose program as a college project.

XVIII.Translate into English.

1. Мова асемблера є дуже зручною для комп'ютера, оскільки існує однозначна відповідність між її мнемокодами та командами в машинному коді.
2.Застосування комп'ютерів із більш досконалими процесорами дозволяє прискорити виконання програм.
3. Мови програмування, які схожі на людську мову і несхожі на машинний код, і, як наслідок, є зручнішими для людини, називаються мовами високого рівня.
5. Мовами програмування є мови, якими програміст пише команди, що їх комп'ютер зрештою виконуватиме.
6. Мови низького рівня далі поділяються на машинну мову та мову асемблера.
7. Термін «низький рівень» означає схожість із тим, як побудована машина.
8. Мови низького рівня є машинно-орієнтованими і вимагають широких знань комп'ютерного апаратного забезпечення та його конфігурації.
9. Машинна мова є єдиною мовою, яку комп'ютер розуміє безпосередньо.
10. Машинну мову вважають мовою першого покоління.
11. Мова асемблера стала першою спробою поліпшити структуру програмування.
12. Деякі комбінації літер можуть бути використані для того, щоб замінити собою числа машинного коду.
13. Мова асемблера має таку саму ефективність виконання, як і машинна мова, оскільки між програмою мовою асемблера та відповідною їй програмою машинною мовою існує однозначний транслятор.
14. Отже, зрозуміло, що програмування чи то машинною мовою, чи мовою асемблера є нелегкою справою.
15. Спочатку ФОРТРАН був дуже схожий на мову асемблера.

XIX.Speak on the following issues.

1. Machine and assembly languages.
2. High-level programming languages.

XX.Work with the Internet.

1. Surf the net and be ready to tell about other popular programming languages.
2. Find some additional information and facts about programming languages.

TEXTS FOR ADDITIONAL READING.

I. High-level languages versus low-level languages.

Computer languages are generally classed as being "high-level" (like Pascal, Fortran, Ada, Modula-2, Oberon, C or C++) or "lowlevel" (like ASSEMBLER). High-

level languages may further be classified as “imperative” (like all of those just mentioned), or “functional” (like Lisp, Scheme, ML, or Haskell), or “logic” (like Prolog).

High-level languages are claimed to possess several advantages over low-level ones:

• *Readability*: A good high-level language will allow programs to be written that in some ways resemble a quasi-English description of the underlying algorithms.

• *Portability:* High-level languages, being essentially machine independent, hold out the promise of being used to develop portable software. This is software that can, in principle (and even occasionally in practice), run unchanged on a variety of different machines.

• *Structure and object orientation*: There is general agreement that the structured programming movement of the 1960’s and the object-oriented movement of the 1990’s have resulted in a great improvement in the quality and reliability of code. High-level languages can be designed so as to encourage or even subtly enforce these programming paradigms.

• *Generality*: Most high-level languages allow the writing of a wide variety of programs, thus relieving the programmer of the need to become expert in many diverse languages.

• *Brevity*: Programs expressed in high-level languages are often considerably shorter (in terms of their number of source lines) than their low-level equivalents.

• *Error checking*: Being human, a programmer is likely to make many mistakes in the development of a computer program. Many highlevel languages — or at least their implementations — can, and often do, enforce a great deal of error checking both at compile-time and at run-time.

These advantages sometimes appear to be overrated, or at any rate, hard to reconcile with reality. For example, readability is usually within the confines of a rather stilted style, and some beginners are disillusioned when they find just how unnatural a high-level language is. Similarly, the generality of many languages is confined to relatively narrow areas, and programmers are often dismayed when they find areas (like string handling in standard Pascal) which seem to be very poorly handled. When one examines successful languages, one finds numerous examples of compromise, dictated largely by the need to accommodate language ideas to rather uncompromising, if not unsuitable, machine architectures. To a lesser extent, compromise is also dictated by the quirks of the interface to established operating systems on machines. Finally, some appealing language features turn out to be either impossibly difficult to implement, or too expensive to justify in terms of the machine resources needed.

I. Some aspects of language design

The design of a programming language requires a high degree of skill and judgement. There are two divergent schools of thought as to how programming languages should be designed. The one, typified by the Wirth school, stresses that languages should be small and understandable, and that much time should be spent in consideration of what tempting features might be omitted without crippling the language as a vehicle for system development. The other, beloved of languages designed by committees with the desire to please everyone, packs a language full of every conceivable potentially useful feature. Both schools claim success. The Wirth school has given us Pascal, Modula-2 and Oberon, all of which have had an enormous effect on the thinking of computer scientists. The other approach has given us Ada, C and C++, which are far more difficult to master well and extremely complicated to implement correctly, but which claim spectacular successes in the marketplace.

Other aspects of language design that contribute to success include the following:

• Orthogonality: Good languages tend to have a small number of well thought out features that can be combined in a logical way to supply more powerful building blocks. Ideally these features should not interfere with one another, and should not be hedged about by a host of inconsistencies, exceptional cases and arbitrary restrictions. Most languages have blemishes — for example, in Wirth's original Pascal a function could only return a scalar value, not one of any structured type. Many potentially attractive extensions to well-established languages prove to be extremely vulnerable to unfortunate oversights in this regard.

• Familiar notation: Most computers are "binary" in nature. Blessed with ten toes on which to check out their number-crunching programs, humans may be somewhat relieved that high-level languages usually make decimal arithmetic the rule, rather than the exception, and provide for mathematical operations in a notation consistent with standard mathematics. When new languages are proposed, these often take the form of derivatives or dialects of well-established ones, so that programmers can be tempted to migrate to the new language and still feel largely at home — this was the route taken in developing C++ from C, Java from C++, and Oberon from Modula-2, for example.

Besides meeting the ones mentioned above, a successful modern high-level language will have been designed to meet the following additional criteria:

• Clearly defined: It must be clearly described, for the benefit of both the user and the compiler writer.

• Quickly translated: It should admit quick translation, so that program development time when using the language is not excessive.

• Modularity: It is desirable that programs can be developed in the language as a collection of separately compiled modules, with appropriate mechanisms for ensuring self-consistency between these modules.

• Efficient: It should permit the generation of efficient object code.

• Widely available: It should be possible to provide translators for all the major machines and for all the major operating systems.

The importance of a clear language description or specification cannot be over-emphasized. This must apply, firstly, to the so-called syntax of the language — that is, it must specify accurately what form a source program may assume. It must apply, secondly, to the socalled static semantics of the language — for example, it must be clear what constraints must be placed on the use of entities of differing types, or the scope that vario hat constraints must be placed on the use of entities of differing types, or the scope that various identifiers have across the program text. Finally, the specification must also apply to the dynamic semantics of programs that satisfy the syntactic and static semantic rules - that is, it must be capable of predicting the effect any program expressed in that language will have when it is executed.

UNIT 10
Malware and vaccines

I.Study the following words and word expressions.

illicit	-	незаконний
to spread	-	поширюватися
threat	-	загроза
bulletin board	-	дошка оголошень, меню
sophisticated	-	досвідчений, складний, витончений
trick	-	трюк
boot sector	-	завантажувальний сектор
to exceed	-	перевищити
malware	-	шкідливе програмне забезпечення
malicious	-	шкідливий
to unleash	-	розв'язати(ся)
hacker	-	хакер
cracker	-	зломщик
to piggyback	-	приєднатися, прикріпитися
to alter	-	змінити
to interfere	-	заважати, втручатися
recurring	-	той, що повторюється; поточний

legitimate	-	законний
trigger	-	спусковий гачок, курок
to replicate	-	повторювати, копіювати
1victim	-	жертва, потерпілий
covertly	-	таємно, приховано
to reproduce	-	відтворювати
truncation	-	укорочення
erratic	-	нестабільний
suspicious	-	підозрілий
shield	-	щит, заслона, захист
to be aware of	-	бути в курсі

II.Read anf translate the text.

Malware and vaccines

A virus is a set of illicit instructions that infects other programs and may spread rapidly. Viruses are one of the biggest threats to the security of your computer files. In 1981 there was only one known computer virus. Early viruses were pieces of code attached to a common program like a popular game or a popular word processor. A person might download an infected game from a bulletin board and run it. But as virus creators got more sophisticated, they learned new tricks, for example, loading viruses into memory or infecting the boot sector on floppy disks and hard disks. Today the count exceeds 100 000. Between 900 and 1 300 new viruses appear every month.

Malware is a general name for all programs that are harmful for computers. Many types of malicious code, including viruses, worms, bombs, Trojan horses and some others are created and unleashed by individuals referred to as “hackers” or “crackers”. A virus is a small piece of software that piggybacks on real program. Viruses spread when people distribute infected files by exchanging disks and CDs, sending e-mail attachments, exchanging music on file-sharing networks, and downloading software from the Web. Many computer viruses infect files executed by your computer – files with extensions such as *.exe, .com.* or *vbs*. When your computer executes an infected program, it also executes the attached virus instructions. A computer virus has two parts: infector and detonator. They have two very different jobs. After the infector has copied the virus elsewhere, the detonator performs the virus’s main work. Generally, that work is either damaging data on your disk, altering what you see on your computer display, or doing something else that interferes with the normal use of your computer.

A virus can be classified as a file virus, boot sector virus, or macro virus. ***A file virus*** infects application programs, such as games. ***A boot sector virus*** infects the system files your computer uses every time you turn it on. These viruses can cause

widespread damage to your computer files and recurring problems. ***A macro virus*** infects a set of instructions called a "macro" – a miniature program that usually contains legitimate instructions to automate document and worksheet production. A trigger event, such as a specific date, can unleash some viruses. For example, the Michelangelo virus triggers on March 6, the birthday of artist Michelangelo.

One of the latest thing in the world of computer viruses is the e-mail virus, which moves around in e-mail messages, and usually replicates itself by automatically mailing itself to dozens of people in the victim's e-mail address book.

There are many other types of malicious code. Among them are the following ones.

A Trojan Horse is a program that covertly places illegal, destructive instructions in the middle of an otherwise legitimate program. The Trojan Horses are usually masked so that they look interesting, for example, a *saxophone.Wav.file* that interests a person collecting sound samples of instruments. A Trojan Horse differs from a destructive virus in that it doesn't reproduce.

A bomb is a program intended to sabotage a computer by triggering damage based on certain conditions: at a specified date, time or when a particular condition occurs. There are two types of bombs: logic and time. Logic bombs are set to go off when a particular event occurs. Time bombs go off at a specified time, date or after a set amount of time elapses.

A worm is a program that spreads by replicating itself. It usually spreads over network connection. Unlike a virus which attach itself to a host program, worms always need a host program to spread. In practice, worms are not normally associated with one-person computer systems. They are mostly found in multi-user systems such as Unix environments.

Bacteria, also known as rabbits, are programs that do not directly damage the system. Instead they replicate themselves until they monopolize CPU, memory or disk space.

Salamis cut away tiny pieces of data. They can be particularly dangerous as the damage they do is small and can be attributed to some truncation of the system. It is possible for a salami to do a great deal of damage before it is found.

When malware activates it does many different things. Might play a part of melody or play music in the background, show a picture or animated picture, show text, format hard disk or do changes to files. We can also distinguish several other symptoms of a computer virus, for example, slow computer performance, erratic computer behavior, unexplained data loss.

There are three steps you can take to prevent your computer from becoming infected:

- use antivirus software on every computing device you own;
- keep software patches and operating system service packs up to date;
- do not open suspicious e-mail attachments.

Antivirus software is a type of utility software that can look for and eradicate viruses. There are actually two kinds of antivirus programs: ***virus shields,*** which detect viruses as they are infecting your PC, and ***virus scanner***, which detect viruses once they've infected a computer. Popular antivirus software for personal computers includes McAfee, VirusScan, Norton AntiVirus and F-Secure Anti-Virus.

Viruses are sometimes to worry about, but not a lot. A little common sense and the occasional virus scan will keep your computer virus-free. Remember these four points:

- viruses can't infect a data or text file;
- before running an antivirus program, be sure to boot from a write-protected floppy;
- don't boot from floppy except reliable DOS disks or your original production disks;
- stay away from pirated software.

There are lots of viruses in the world and new viruses are coming up every day. There are new anti-virus programs and techniques developed too. It is good to be aware of viruses and other malware and it is cheaper to protect your environment from them rather than being sorry.

III.Discuss the following questions.

1. What is a computer virus?
2. How do viruses usually spread?
3. What does the term "malware" mean?
4. What parts does a computer virus consist of?
5. Are there different kinds of viruses?
6. How do different classes of viruses harm the computer?
7. What is a Trojan horse?
8. What is a Bomb intended for?
9. What are the peculiarities of a Worm?
10. What do Bacteria and Salamis do when entering your computer?
11. What symptoms of activating viruses in a computer do you know?
12. How can you avoid viruses and worms?
13. What is antivirus software? How does it work?
14. How can you protect your computer system from malware?

IV.Decide whether the following statements are true or false. If you think a statement is false, change it to make it true.

1. A virus is contagious.

2. From now on you need to check you IBM or IBM compatible personal computer for the presence of Michelangelo before each Friday the 13th or risk losing all the data on your hard disk when you turn on your machine that day.
3. A virus may be dealt with by means of a vaccine or antivirus program, a computer program that stops the spread of viruses and often eradicates them.
4. It is rather easy to protect hard disks.
5. Viruses cannot be spread through a computer network, only via floppies transported from computer to computer.
6. The virus will spread as soon as you put the infected disk in your PC.
7. The infector works by intefering in some way with the normal use of your computer.
8. Most viruses spread through pirated games.
9. Virus shields are more effective than virus scanners.
10. You should run an antivirus program every time you use your computer.
11. There are not very many viruses in circulation.

V.Give English equivalents to the following words and collocations.

Комп'ютерний вірус; незаконні інструкції; заражати комп'ютерну програму; поширюватися; безпека комп'ютера; завантажити заражену гру; завантажити віруси в пам'ять; шкідливе програмне забезпечення; шкідливий код; прикріплятися до справжньої програми; відправляти повідомлення електронної пошти; обмінюватися музикою в мережах обміну файлами; інфектор; детонатор; пошкодження даних на дискі; перешкоджати нормальному використанню комп’ютера; вірус завантажувального сектора; файловий вірус; викликати повторювані проблеми; розв'язати (активізувати) деякі віруси; копіюватися; таємно розміщувати незаконні інструкції; нашкодити; активізуватися в певний час; прикріплятися до хостової програми; пошкодити систему; монополізувати процесор; урізання системи; форматувати жорсткий диск; повільна продуктивність комп'ютера; нестабільна поведінка; втрата даних; запобігти зараженню; антивірусне програмне забезпечення; обновляти програмне забезпечення; підозрілі вкладення; позбавлятися вірусів; тримати комп'ютер без вірусів; піратське програмне забезпечення.

VI.Find synonyms to the words given below using the active vocabulary of the text:

illegal, to poison, to expand, hazard, insurance, bacillus, frauds, detrimentral, evil-minded, to barter, to duplicate, to deface, to modify, to collide, common, frequent, disastrous, waste, to avoid, utensil, to eliminate, to discover.

VII.Find antonyms to the words given below using the active vocabulary of the text:

authorized, to cure, sluggishly, danger, disconnected, inexperienced, assisting, benefit, limited, to turn off, frankly, harmless, safe, normal, profit, aid, believable, neglect.

VIII.Choose the ending for each sentence from the proposed versions.

2. Any program designed to enter a computer and disrupt its normal operations is called ___.

a) malicious code; ***b) utility.***

3. Many types of malicious codes are created by ___.

a) the computer itself; ***b) individuals referred to as "hackers".***

4. A boot sector virus infects the system files your computer uses ___.

a) every time you turn it on; ***b) when you are connected to the Internet.***

5. A change in the length of a program from one computing session to the next ___.

a) indicated the possible presence of a virus;

b) is a result of operation system work.

6. A checksum is ___.

a) a number calculated by combining the binary values of all bytes in a file;

b) the cost of an antivirus program.

7. A virus can be spread if people distribute infected files by ___.

a) exchanging disks or CDs ***b) sending e-mail attachments***

c) downloading software from the Web ***d) all of the above***

8. Some computer viruses are programmed to harm your computer by ___.

a) damaging programs, deleting files, or reformatting the hard drive.

b) providing fixes for features that aren't working as intended or adds minor software enhancements and compatibility.

9. Antivirus software was originally developed ___.

a) to add new hardware in a computer that improves its performance.

b) to detect and remove computer viruses.

c) to examine and remove errors from a program's source code.

10. A computer worm is a type of malicious software program whose primary function is ___.

a) to provide people with a common language or reference point when dealing with a project or process.

b) to allow the CPU, RAM, and all other computer hardware components to communicate with each other.

c) to infect other computers while remaining active on infected systems.

IX.Fill in the gaps using the following words and expressions:

a) worm ***b) antivirus*** ***c) conviction*** ***d) Ping Pong***

e) expression f) viruses g) disable h) bomb
i) ahead j) vaccines k) affected l) test m) Trojan horse

1. The terms … and … have entered the jargon of the computer industry to describe some of the bad things that can happen to computer systems and programs.
2. The … is a program that spreads by replicating itself.
3. … program is a computer program that stops the spread of and often eradicates the virus.
4. The … virus bounces a "… ball" around your screen while you are working.
5. The … is a program intended to sabotage a computer by triggering damage based on certain conditions – usually at a later date.
6. You should always … diskettes you share with others.
7. The … is a program that covertly places illegal, destructive instructions in the middle of an otherwise legitimate program.
8. Entire computer networks can be … by viruses.
9. Viruses sometimes … systems for a whole day.
10. Some virus writers maintain that virus writing is a form of creative … .
11. Despite the possibility of a … if they are caught, they continue to write viruses.
12. Software companies are forced to keep … of the game.

X. Suggest words or phrases that have a similar meaning to:

1) an entirely self-replicating virus which is not hardware dependent;
2) a program that stops spread of and often eradicates the virus;
3) a fixed disk inside a computer which may not be removed;
4) a flexible magnetic disk which can be removed from the computer;
5) a general term for any computer malicious program;
6) being inhabited by a computer virus;
7) replacement or modernization of software with a later version of the same software
8) a type of malware that infects executable files with the intent to cause permanent damage or make them unusable.
9) it prevents, detects and removes malicious software.
10) it works by embedding malicious code in the macros that are associated with documents, spreadsheets and other data files.

XI.Match the terms and definitions listed below.

TERMS	DEFINITIONS
Virus	**1)**part of a virus which performs the intended nasty work, for example, destroys data;

Detonator	**2)**self-replicating malware that duplicates itself to spread to uninfected computers;
Infector	**3)**malware that infects the computer storage sector where startup files are found;
File Viruses	**4)** software which is specifically designed to disrupt, damage, or gain authorized access to a computer system;
Boot sector viruses	**5)** a program or set of programs that are designed to prevent, search for, detect, and remove software viruses, and other malicious software;
Macro viruses	**6)** making something more modern or up to date;
Worm	**7)** adding new hardware in a computer that improves its performance;
Trojan horse	**8)** malicious code that replicates by copying itself to another program, computer boot sector or document and changes how a computer works;
Antivirus software	**9)** its role is to infect the files of a computer;
Bacteria	**10)** a program that appears to be legitimate but in reality does something malicious. It does not replicate and infect other files;
Updating	**11)** the act of illegally using, copying or distributing software without ownership or legal rights;
Upgrading	**12)** a type of computer viruses that inserts its malicious code into executable files on a system;
Malware	**13)** a type of malware that creates many instances of themselves, or run many times simultaneously, in order to consume large amounts of system resources;
Software piracy	**14)** a computer virus that spreads to other computers through software programs that utilize macros.

XII. Choose the right words from the proposed ones.

Police in Israel say they have … ***(uncovered/ dissimulated/ displayed)*** a huge industrial … ***(communicative/ spying/ entertaining)*** ring which used computer viruses to … ***(greet/ cure/ probe)*** the systems of many major companies. At least 15 Israeli firms have been … ***(awarded/ implicated/ excluded)*** in the espionage plot, with 18 people … ***(arrived/ arrested/ robbed)*** in Israel and two more … ***(held/ dressed up/ employed)*** by British police.

Among those under … ***(admiration/ suspicion/ gravitation)*** are major Israeli telecoms and media companies. Police say the companies used a "Trojan horse" computer … ***(hardware/ component/ virus)*** written by an Israeli to … ***(hack/ collaborate/ ally)*** into … ***(acquaintances'/ rivals'/ relatives')*** systems. Interpol and the authorities in Britain, Germany and the US are already involved in … ***(investigating/***

concealment/ cultivating) the espionage, which Israeli police fear may involve major international companies. This is one of the … ***(gravest/ pleasurable/ picturesque)*** scandals in Israel.

Two rival car import firms are … ***(suspected/ authorized/ admitted)*** of spying on each other, as are two of Israel's major satellite and cable television companies. No … ***(expenses/ charges/ contradictions)*** have been brought so far and the companies at the centre of the police … ***(demand/ reference/ inquiry)*** say they have done nothing wrong and are co-operating with the authorities. Police fear that as many as 60 Israeli and international companies could be involved or … ***(affected/ sold/ modernized).*** Trojan horse viruses work by … ***(mending/ installing/ deleting)*** themselves within a computer system and then … ***(prohibiting/ assuming/ allowing)*** hackers to monitor, … ***(track/ court/ trunk)*** or even control that system.

XIII.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.

XIV.Fill in the blanks choosing from the variants given in brackets.

1. Does the term computer virus refer to any malicious code that … ***(makes up/ invades/ modernizes)*** a computer system?
2. When your computer executes an infected program it … ***(executes/ deletes/ updates***) the attached virus instructions.
3. Love letter is one of the … ***(slowest/ fastest)*** spreading mass-mailing worms of all time.
4. Hackers created viruses that insert themselves into … ***(used/ unused)*** portions of a program file without changing its length.
5. A computer virus is a set of programs that attaches itself to a … ***(file/ hard disk/ driver)***.
6. If a document contains an infected macro, the macro virus … ***(selects/ deletes/ duplicates)*** itself into the general macro pool, where it is picked … ***(up/ of/ under)*** by other documents.
7. A virus might deliver a payload which could be both harmless and … ***(innocuous/ devastating/ corrupt).***
8. Software that can automate a task when … ***(greeted/ removed/ commanded)*** to do so is called an intelligent agent.

9. A trigger event, such as a specific date, can … ***(unleash/ detect/ prevent)*** some viruses.
10. Once a virus has successfully … ***(attached/ disconnected/ subscribed)*** to a program, file, or document, the virus will lie … ***(entertaining/ hesitating/ dormant)*** until circumstances cause the computer or device to execute its code.

XV.Match the beginnings of the sentences in the first part with the endings in the second one.

I.

1. A backup is a copy of one or more files …
2. A good backup plan allows you …
3. You must devise your own backup plan …
4. A full-system backup takes a lot of time …
5. Your backup schedule depends on how much data …
6 The backup device you select depends on the …
7. If your computer is connected to a local area network …
8. Your backup schedule depends on …
9. No single backup plan fits …
10. You can't always prevent data disasters …
11. You must devise your own backup plan …
12. Under normal use …
13. The best idea is storing your backups at a different location …

II.

a) to restore your computing environment to its pre-disaster state with a minimum of fuss.
b) and automating the process requires a large capacity tape backup device or a second hard disk drive.
c) that is tailored to your particular computing needs.
d) that has been made in case the original files become damaged.
e) value of your data, your current equipment, and your budget.
f) you can afford to lose.
g) you might be able to use the network server as a backup device.
h) that is tailored to your particular computing needs.
i) most people schedule a once-a-week backup.
j) how much data you can afford to use.
k) everyone's computing style or budget.
l) but at least store them in a room apart from your computer.
m) so you need a backup plan that helps you recover data that's been wiped out.

XVI.Write the correct form of the word in bold in each gap.

I.

Cyberspace does not … ***(respected)*** national security, … ***(commerce)*** sensitivity or individual … ***(private).*** Increasing … ***(reliable)*** on information technology, with all the benefits it brings, comes with a hefty price tag. However, … ***(success)*** an organisation may be, its Achilles' heel lies with its … ***(dependent)*** on information systems. The price tag is the cost of fighting computerised fraud or sabotage.

Aside from the … ***(dangerous)*** of internal … ***(to interfere)***, any of today's organisations are potentially at risk from ***… (to hack),*** computer viruses or other forms of … ***(disruptive).*** Computer viruses … ***(variation)*** in impact and sophistication. The less harmful may prove more … ***(inconvenience)*** than … ***(destruction),*** perhaps causing strange or inappropriate messages to … ***(appearance)*** on screen. The most dangerous can cause entire systems to crash or may … ***(introduction)*** software bugs whose presence remains undetected until serious damage has been done.

Organisations running an intranet or those with … ***(accessible)*** to the Internet, may find hackers and they can … ***(entrance)*** the system, steal information or leave a destructive bug. Files … ***(to download)*** from the Internet may be corrupt, unauthorised e-mails may contain the seed of destruction. For businesses everywhere, the battles have just begun!

XVII.Insert suitable words using professional vocabulary.

A computer virus is a **…** software program loaded onto a user's computer without the user's **…** and **…** malicious actions. The term 'computer virus' was first formally **…** by Fred Cohen in 1983. Computer viruses never **…** naturally. They are always **…** by people. Once **…** and released, however, their diffusion is not directly under human control. After entering a computer, a virus **…** itself to another program in such a way that execution of the host program **…** the action of the virus simultaneously. It can self-replicate, inserting itself onto other programs or files, **…** them in the process.

Not all computer viruses are **…** though. However, most of them **…** actions that are malicious in nature, such as **…** data. Some viruses wreak havoc as soon as their code is **…**, while others lie dormant until a particular event (as programmed) gets initiated, that **…** their code to run in the computer. Viruses spread when the software or documents they get attached to are **…** from one computer to another using a network, a disk, file **…** methods, or through infected e-mail **….** Some viruses use different stealth strategies to **…** their detection from anti-virus software. For example, some can **…** files without increasing their sizes, while others try to **…** detection by killing the tasks associated with the antivirus software before they can be detected. Some old viruses make **…** that the "last modified" date of a host file stays the same when they infect the file.

XVIII.Translate into English:

1. Багато користувачів ПК ніколи не бачили вірусів і їм важко повірити, що існує така проблема.
2. Протягом двох років комп'ютерні віруси вплинуть на мільйони ПК.
3. Не дивлячись на те, що всі видавництва комп'ютерних журналів і комп'ютерні компанії зі світовим іменем вкладають багато коштів намагаючись добитися контролю над вірусами, очевидно, що віруси поки непереможені.
4. Ви повинні регулярно зберігати свої дані, завжди завантажуватися з жорсткого диска чи з захищеної від запису системної дискети.
5. Використовуйте програми виявлення вірусів для всього програмного забезпечення, яке ви отримуєте.

XVIII. Match the crimes with their short descriptions.

Computer crime description	Description
Salami shaving	**a)** an illicit program that allows unauthorized and unknown entry;
Denial of service attack	**b)** using another person's identification code or using that person's files before he or she has logged off;
Trojan horse	**c)** adding concealed instructions to a computer program so that it will still work but will also perform prohibited duties. In other words, it appears to do something useful but actually does something destructive in the background;
Trapdoors	**d)** tricking a user into revealing confidential information such as an access code or a creditcard number;
Mail bombing	**e)** inundating an email address with thousands of messages, thereby slowing or even crashing the server;
Software piracy	**f)** manipulating programs or data so that small amounts of money are deducted from a large number of transactions or accounts and accumulated elsewhere. The victims are often unaware of the crime because the amount taken from any individual is so small;
Piggybacking	**g)** unauthorized copying of a program for sale or distributing to other users;
Spoofing	**h)** swamping a server with large numbers of requests;
Defacing	**i)** redirecting anyone trying to visit a certain site elsewhere;

Hijacking	**j)** changing the information shown on another person's website.

XIX.Prepare a report:

- "Harmful Impact of Viruses".
- "Who or what is a hacker?"
- "Computer crimes do not differ from other crimes."

TEXTS FOR ADDITIONAL READING

I. Computer Trespassing

Breaking into a computer system (using it when you don't have permission) is a crime. It is called computer trespassing. People break into computer systems for many reasons. They might do it to find out private records, to change or destroy information, to steal money or goods, or simply to show they know how to do it.

Computer trespassing is a serious problem. Important information ranging from medical records to top secret military information is often stored in computer systems. If someone changes, destroys, or steals the information, he or she might cause great damage. For example, a trespasser in a hospital computer system might endanger a patient's health by changing his or her medical records, in the case of a government computer system, a computer trespasser might threaten national security by stealing military information. A trespasser in a bank's computer system might steal millions of dollars.

How can we prevent computer trespassing? One way to protect information stored in computer systems is to use passwords or number codes. The words or codes are programmed into the computer system. The system will admit only those people who enter the correct code. An alarm alerts a security guard if someone enters an incorrect code more than once. Some computer systems use cryptography (secret writing) to protect information. Such systems store information in the computer in coded or scrambled form. If you don't know how to unscramble the information, it is meaningless.

Federal and state laws also protect information stored in computer systems. One federal law, the Counterfeit Access Device and Computer Fraud and Abuse Act of 1984, prohibits people from using a computer system without permission. It also prohibits the use of a computer system: (1) to steal money or goods worth $5,000 or more: (2) to use, change, destroy, or reveal restricted information in government files; (3) to obtain financial information and credit records that are protected by other federal laws.

II. Computer Viruses and Piracy: Problems for Businesses

PCs have transformed the small-business world. Unfortunately, some of the features of computers that have opened up a new world for businesspeople have also put that world in danger. Hackers can break into important and confidential documents without authorization and gain access.

Computer crime is often difficult to prove because of the large number of people who can tap into a company's files and the amount of damage they can wreak from a distance. A computer employee with a grudge can wipe out all the company's records with a few keystrokes, on a home computer. In this way complete strangers can and do sabotage private and company computers in the name of fun or mischief.

Like a physical virus, a computer virus attaches itself to a host program. Some viruses replicate themselves until they take up all the space in a computer's memory, causing the system to crash. Others invade specific programs, slowly altering data (perhaps reversing the digits in numbers) so that the virus remains undetected for a long time. Still others attack the system's vital first track, the track that tells the computer where all other records are stored, thus effectively wiping out records. Thanks to modems and the popularity of computer "bulletin boards," some viruses have been able to cross continents and infect thousands of machines.

The same businesses that fall victim to computer viruses are often guilty of committing another breach of computer ethics: software piracy. For years, software producers built copy protection into their programs. But faced with consumer outcry that such protection caused problems with many programs and made it difficult for legitimate owners of software to use that software on different machines at different times, producers dropped such protection. Today virtually anyone can make hundreds, even thousands, of copies of a popular software program.

UNIT 11
What is the Internet?

I.Learn the following words and phrases.

global network	-	глобальна мережа
host	-	хост (комп'ютер, підключений до мережі Інтернет)
remote terminal	-	дистанційний (віддалений) термінал

route	-	маршрут
packet switching	-	пакетне переключення
to knock out	-	вибити, вивести з ладу
to survive	-	залишитися живим, вижити, перенести, пережити
to pollute	-	забруднювати, поганити
to coin	-	вигадувати, створювати
snail mail	-	звичайною поштою
vast	-	величезний, широкий
databases	-	бази даних
server	-	сервер
hypertext document	-	гіпертекстовий документ
to designate	-	призначити, встановлювати, указувати
browser (Web browser)	-	Web-браузер (програма для просмотру Web-сторінок в мережі Internet)
communication network	-	мережа зв'язку
IP (Internet protocol)	-	Internet-протокол
ISA	-	Інтернет-провайдер
accessible	-	доступний
to log on	-	залогінитися, входити
to surf the net	-	шукати; “блукати” по інтернету
drastically	-	різко, рішуче
to chat	-	спілкуватися (через інтернет)
advertising	-	реклама
fee	-	плата
World Wide Web	-	Всесвітня Мережа
to feature	-	показувати на екрані
usenet	-	новинна сітка, юзнет
number-crunching	-	швидка обробка великої кількості чисел

NOTE:

HTML (HyperText Markup Language) — мова HTML (стандартна мова, яка використовується для створення сторінок WWW).
URL (Universal Resource Locator) — універсальный покажчик информаційного ресурсу (стандартизований рядок символів, що вказує на місцезнаходження документа в мережі Internet).

II.Read and translate the text.

What is the Internet?

The Internet is a global network connecting millions of computers. The best way to think of the Internet, or Net as it is often called, is as a vast global network of networks connecting computers across the world. Each Internet computer, called a host, is independent. A host is a computer system with the data which is accessed by a user when there are two computer systems connected by modems and telephone lines. The computer at which the user sits is called the remote terminal. Most of the Internet host computers (more than 50%) are in the United States.

Information sent over the Internet takes the shortest path available from one computer to another. Because of this, any two computers on the Internet will be able to stay in touch with each other as long as there is a single route between them. This technology is called packet switching. Owing to this technology, if some computers on the network are knocked out (by a nuclear explosion, for example), information will just route around them. One such packet-switching network already survived a war. It was the Iraqi computer network which was not knocked out during the Gulf War.

The prototype for the Internet was created in the sixties by the US Defence Department. To ensure that communication could be kept open in the event of a nuclear attack, it created a computer network known as Arpanet – the Advanced Research Project Agency Network. It was designed to survive a nuclear war, when everything around might be polluted by radiation and it would be dangerous to get out for any living being to get some information to anywhere.

The first attempt to connect two computers and allow them to communicate with one another was made by researchers at the University of California in Los Angeles and the Stanford Research Institute on the 20th of October 1969. The first people to coin the term "Internet" were two scientists, Vinton Cerf (known as "the father of the Internet") and his collaborator, Bob Kahn, who in 1974 devised a means by which data could be transmitted across a global network of computers.

On the whole, the Internet environment can be divided into five broad areas:

1. Electronic Mail.

E-mail is much faster than traditional or snail mail because once the message is typed out, it arrives in the electronic mailbox of the recipient within minutes or seconds. Anything that can be digitized – pictures, sound, video – can be sent, retrieved, and printed at the other end. This is efficient, convenient, and saves trees! All Internet Service Providers (ISPs) offer e-mail services so that you can exchange mail with other users. The first e-mail ever sent was in 1972 between computers in two American universities. It said "qwertyuiop" (the top line of the computer keyboard).

2. Information sites

This is perhaps the fastest growing area of the Internet as more and more people put their own information pages on line. One thing that computers do very well is processing vast amounts of information very fast, so, by specifying a key word or phrase, the computer can then search around the Net until it finds some matches.

3. The World Wide Web

The World Wide Web, usually referred to as WWW or 3W, is a vast network of information databases that feature text, visuals, sound, and even video clips. The Internet and the Web are two separate but related things. The Internet connects millions of computers together globally, forming a network in which any computer can communicate with any other computer as long as they are both connected to the Internet. The World Wide Web, or simply Web is built on top of the Internet. The Web is just one of the ways that information can be sent and received over the Internet. Tim Berners-Lee (born 1955) invented the World Wide Web. His first version of the Web was a program named "Enquire". He invented the system as a way of sharing scientific data (and other information) around the world, using the Internet.

Information travels over the Internet in many languages known as protocols. Tim Berners-Lee wrote the language HTML (HyperText Mark-up Language), the basic language for the Web, and devised URL's (Universal Resource Locators) to designate the location of each web page. HTTP (HyperText Transfer Protocol) was a set of rules for linking to pages on the Web. After he wrote the first browser in 1990, the World Wide Web was up and going. Its growth was (and still is) phenomenal, and has changed the world, making information more accessible than ever before in history.

There are several applications called Web browsers that make it easy to access the World Wide Web. The two most popular browsers are Netscape Navigator and Microsoft Internet Explorer. Both of these are graphical browsers, which means that they can display graphics as well as text. In addition, most modern browsers can present multimedia information, including sound and video.

4. Usenet

Usenet is a collection of newsgroups covering any topic. Newsgroup allow users to participate in dialogues and conversations by subscribing free of charge. Each newsgroup consists of messages and information posted by other users.

5. Telnet

Telnet programs allow you to use your personal computer to access a powerful mainframe computer. If you are an academic, or just have a lot of number-crunching to do it can be very useful and cost-effective.

There are many ways to gain access to the Internet. One of the ways is to gain access with the help of commercial Internet Service Provider (ISP). ISPs are also called IAPs (Internet Access Providers). ISP is a company that provides access to the Internet. For a monthly fee, the service provider gives you a username, password and access phone number. Equipped with a modem, you can then log on to the Internet and browse the World Wide Web.

There are many ways of using the Internet nowadays. One of them is to find information. It’s much faster and easier to surf the net in search of information from all over the world than to travel to libraries in dozens of countries. You can also use the Internet to read newspapers and magazines, play games, plan your holiday or buy from your favourite shop. Commercial use of this network is drastically increasing too.

However, the real world of the Internet may not be as perfect as it seems. With so much information available, finding what you want can take you hours. Besides, there is too much advertising instead of real information. As for Internet friendships, sitting at home in front of a computer making “chat friends” is not the same as actually meeting people.

III.Answer the questions to the text.

1.What is the Internet?
2. When and where did the history of Internet begin?
3. Why was the Internet designed?
4. What technology is called packet switching?
5. What areas does the Internet consist of?
6. What is e-mail? And what are its advantages?
7. When was the first e-mail sent?
8. Could you give a brief description of information sites?
9. What is the World Wide Web?
10. Who invented the first version of the Web?
11. What can one do on the WWW?
12. Where are most of the Internet host computers?
13. What are Usenet groups? Are you a member of any of them?
14. What do Telnet programs allow?
15. What is the Internet facilitated by?
16. What does the complex communications infrastructure of the Internet consist of?
17. What is Internet provider?
18. What is the main use of the Internet?
19. What is the most popular Internet service today?
20. Are there many users of the Internet nowadays?

IV. Say whether the following sentences are true or false. Correct the false ones.

1. The Internet began in the USA in 1969 as a scientific experiment.
2. Owing to packet switching, if some computers on the network are knocked out, information will just route around them.
3. Although the number of host computers can be counted fairly accurately, everybody knows exactly how many people use the Internet.
4. The most popular Internet services are e-mail, using the WWW, information sites and Search Engines.
5. The information sites are usually stored on big computers and optical disks that exist all over the world.

6. There are more than 10,000 newsgroups and they are popular with military and government.
7. The Internet consists of its hardware components and a system of software layers.
8. While being on the Internet you can use only one source of information.
9. Travelling about the Internet you are limited by some boundaries.
10. In order to enter a web site you need a special allowance.
11. It's much faster to find information in the library than in the Internet.
12. The access to the Internet is limited.
13. The quality of communication via the Internet is rather poor.
14. It is impossible to transfer entire books through the Internet.
15. The Internet strengthens real human communication.

V.Find English equivalents to the words and phrases given below.

Величезна глобальна мережа мереж; віддалений термінал; надсилати інформацію через Інтернет; взяти найкоротший шлях; підтримувати зв'язок один з одним; комп'ютер в Інтернеті виведений з ладу; рухатися навколо; пережити війну; прототип для Інтернету; забруднювати випромінюванням; передавати через глобальну мережу комп'ютерів; прибути в електронну скриньку одержувача протягом декількох хвилин; оцифровувати; витягнути (інформацію); пропонувати послуги; обмінюватися поштою з іншим користувачем; ставити інформаційні сторінки в режимі онлайн; вказати ключове слово; шукати по Інтернету; пов'язані речі; з'єднати глобально; спосіб обміну науковими даними; зробити інформацію більш доступною; отримати доступ до Інтернету; забезпечити доступ до Інтернету; увійти в Інтернет; шукати в Інтернеті; займати багато часу; Інтернет-дружба.

VI. In the text find synonyms to the words proposed below and use them in the sentences of your own:

chain, independent, join, to socialize, entry, distant, obtainable, endure, to contaminate, try, to permit, explorer, invent, to convey, surroundings, receive, comfy, enormous, databank, associated, to determine, introduce, to take part, cost, news, to furnish, dramatically, absolute.

VII. In the text find antonyms to the words proposed below and use them in the sentences of your own:

local, disunite, miniature, subordinate, close, unobtainable, to die, to hurt, to purify, secure, extraordinary, to departure, irrelevant, ordinary, restricted, to remove, moderately, to diminish, second-rate.

VIII.Choose the right word or phrase:

1. If you want to obtain up-to-date information about any possible subject, you need to _____ the Internet.

accede ***access*** ***accession*** ***acceleration***

2. To be able to find the information you want your computer needs to have a good _____.

search machine ***search tool*** ***search engine*** ***search device***

3. Buying things on the Internet is _____.

e-shopping ***e-business*** ***e-buying*** ***e-commerce***

4. Shopping on some websites is like going round a supermarket with a cart and then going to the _____ .

checkout ***check-in*** ***check mark*** ***check-up***

5. People who use the Internet are becoming more and more _____, they want to be able to use it wherever they are.

emotional ***moving*** ***mobile*** ***motivated***

6. A web browser is a software application for retrieving, presenting and traversing information resources on _____ .

the World Wide Web ***the Internet*** ***the motherboard*** ***the ISP***

7. Managing files on a _____ is also something Telnet is sometimes used for.

disk ***website*** ***protocol*** ***fold***

8. For most Internet users, _____ practically replaced the postal service for short written transactions.

articles ***webpages*** ***blogs*** ***e-mails***

9. Using the Web, you have _____ to billions of pages of information.

income ***updating*** ***access*** ***upgrading***

10. The Internet grew out of a computer _____, which was called ARPANET.

social group ***networkb*** ***game*** ***website***

11. Thanks to the _____, the user can find all the necessary data quickly.

WWW ***daily mail*** ***e-mails*** ***protocols***

12. The Internet is one of the best sources for _____ information.

loosing ***up-to-date*** ***debugging*** ***proving***

13. The program enables you to _____ the Internet in seconds.

access ***postpone*** ***visit*** ***transmit***

14. The electronic _____ such as Britannica and Encarta are available on both CDs and DVDs.

books ***circuits*** ***encyclopedias*** ***access***

15.By means of the Internet, companies sell goods and services _____ to customers.

freely ***with pleasure*** ***online*** ***directly***

IX.Match the terms to their definitions.

TERMS	DEFINITIONS
Browser	**1)**a worldwide distributed discussion system available on computers.
the Internet	**2)**a company that provides individuals and other companies access to the Internet and other related services such as Web site building and virtual hosting.
the Internet host	**3)**information stored on a computer that is exchanged between two users over telecommunications.
Modem	**4)** was built to be form of remote control to manage mainframe computers from distant terminals.
e-mail	**5)** is the global system of interconnected computer networks that use the Internet protocol suite (TCP/IP) to link devices worldwide.
ISP	**6)** refers to any computer (server) that is interlinked with another machine(s) through an Internet connection.
WWW	**7)** a computer language devised to allow website creation.
HTML	**8)** an application program that provides a way to look at and interact with all the information on the World Wide Web.
HTTP	**9)** an information space where documents and other web resources are identified by Uniform Resource Locators (URLs), interlinked by hypertext links, and can be accessed via the Internet.
Usenet	**10)** the set of rules for transferring files (text, graphic images, sound, video, and other multimedia files) on the World Wide Web.
Telnet	**11)** a hardware device that allows a computer to send and receive data over a telephone line or a cable or satellite connection.

X.Put the words in brackets into the necessary forms.

I.

Bill Gates — the Founder of Microsoft

William Henry Gates was born in Seattle, Washington, in 1955. He is a chairman and chief _____ (***to execute)*** officer of the Microsoft Corporation. Gates was the _____ ***(to found***) of Microsoft in 1975 together with Paul Allen, his partner in computer language _____ ***(to develop).*** While _____ ***(to attend)*** Harvard in 1975,

Gates together with Allen _____ ***(development)*** a version of the BASIC computer _____ ***(to program)*** language for the first _____ ***(a person)*** computer.

In the early 1980s, Gates _____ ***(leader)*** Microsoft's evolution from the _____ ***(to develop)*** of computer programming languages to a large computer software company. This _____ ***(to transit)*** began with the _____ ***(to introduce)*** of MS-DOS, the operating system for the new IBM Personal Computer in 1981. Gates also led Microsoft towards the introduction of _____ ***(to apply)*** software such as the Microsoft Word Processor.

Much of Gates' _____ ***(successful)*** is based on his _____ ***(able)*** to use market strategy. Gates has accumulated great wealth from his _____ ***(to hold)*** of Microsoft stock. Gates still continues to work _____ ***(a person)*** in product development at Microsoft.

II.

There are some problems with the use of the Internet remaining nowadays. The most important is _____ ***(secure).*** When you send an e-mail _____ ***(messanger)*** to somebody, this _____ ***(messanger)*** can travel through many different networks and computers. The _____ ***(datum)*** are constantly being _____ ***(direction)*** towards its destination by special computers called routers. Because of this, it is possible to get into any of computers along the route, _____ ***(interception)*** and even _____ ***(changeable)*** the data being sent over the Internet. In spite of the fact that there are many strong _____ ***(encode)*** programs available, nearly all the information being sent over the Internet is _____ ***(transmition)*** without any form of encoding, i.e. “in the clear”. But when it becomes _____ ***(to necessitate)*** to send important information over the network, these encoding programs may be _____ ***(to use).*** Notwithstanding these programs are not _____ ***(perfection)*** and can easily be cracked.

Some American banks and companies even _____ ***(conductor***) transactions over the Internet. However, there are still both _____ ***(commerce)*** and technical problems which will take time to be _____ ***(resolution).*** Another big and serious problem of the net is control. Yes, there is no _____ ***(effect)*** control in the Internet, because a huge amount of information _____ ***(circulation)*** through the net. It is like a tremendous library and market together. In the future, the situation might change, but now we have what we have.

XI. Complete the sentences with the words in the box. Translate.

a) GIF b) text c) graphics d) table e) background
f) linkg) CSS g) frame h) JPEG i) website
j) space k) navigation bar

A well-designed … should be neat and organized. Words should be surrounded by sufficient white … . Use dark … on a light …, preferably white. You can divide the page into columns with a … or use … to create the page layout. Usually the … appears on the left side of the page. You can display it on all the pages of your website by using a … . It is a good idea to put a … to the top of the page at the bottom of a long text. The graphical element of a web page is crucial. … load slowly, so use them sparingly and for good reason. There are two common picture formats: … for pictures with lots of colours and … which is ideal for buttons and banners.

XII.Fill in the blanks.

a) improving b) rate c) mail d) efficiency e) network
f) rectified g) authorized h) Security i) exchange j) perform
k) wireless l) connected m) confidentiality n) authentication
o) regularly p) transformed q) compete r) connectivity
s) support t) access u) availability

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

It has grown at a surprising …. Almost everyone has heard about it and an increasing number of people use it …. It has … the agricultural field and allowed farmers to … with massive issues they face. Complexity in the software has to be … in order to … the IoT network. Therefore, software must be developed as user-friendly for … the farming, production and quality of the crop. … is the major threat in the IoT applications. Security has to be enhanced through proper … control, data … and user …. Technical skill is required for farming to enhance the organizational … and to … the farming functions, solving problems and more. Proper supporting infrastructure can be developed with proper internet … and …. Some of the opportunities taken for reviewing the applications of internet are low power … sensor, better connectivity, operational … and remote management.

XIII.Fill in the gaps using professional vocabulary.

1. It allows your computer to get information … on other computers far away.
2. Computers are … to the Internet through telephone and cable systems.
3. This network allows you to … email messages from your computer to your friends' computers.
4. In an effort to … other people's computers, some users (sometimes called hackers) write software that controls or destroys another computer's programs or data.

5. E-mail is popular because it is ... than sending a letter and … than a telephone conversation.
6. In the early 21st century a new type of online encyclopedia (known as Wikipedia) … readers to create and edit encyclopedia articles.
7. She likes to … with friends by e-mail.
8. I did a … on the Internet and found three airlines with tickets available on that date.
9. If you need to write an essay, the Internet will be a useful means of all kinds of ….
10. Educational games are very … if you want to develop knowledge or skills.
11. The company … cheap Internet access. In addition, it makes demo … of various programs freely available.
12. In addition to electronic commerce, companies use the Net to … with other businesses to exchange financial information as well as to … various databases.

XIV. Choose the correct words from proposed ones.

I.

Computer network operations

A network typically includes five things (besides the computers themselves):
– protocol: a set of communication … ***(possibilities, rules, advices)*** to make sure that everyone speaks the same language. Two computers with different … ***(framework, protocols, hardware)*** won't be able to communicate with one another. While many computers have the ability to … ***(interpret, send, decorate)*** multiple protocols, it is important to understand the different protocols available before deciding on one that is… ***(appropriate, repetitive, formatted)*** for your network;
– network interface cards (NICs): cards that you … ***(screw, nag, plug)*** into the back (or side) of your computers to send and … ***(cancel, receive, rewrite)*** messages from other computers;
– cable (transmission medium): the medium to … ***(split, mix up, connect)*** all the computers together. The most spread media are coaxial cables, … ***(unfamiliar, obsolete, twisted)*** pairs, and fiber- … ***(optic, cosmic, spectacled)*** cables.
– hub: hardware to … ***(violate, perform, participate)*** traffic control.
– operating system: the main of its goals are … ***(cloaking, erasing, processing)*** of databases, regular reporting, control of distributed resources of a network.

II.

A computer … ***(scheme, network, flowchart)*** consists of two or more computers that are interconnected in order to … ***(take away, share, gain)*** resources, exchange … ***(folds, files, notes),*** or … ***(prohibit, allow, employ)*** electronic communications. The computers on a network may be … ***(disconnected, linked, jumbled)*** through … ***(wire, passwords, cables),*** telephone lines, radio … ***(channels, waves, types),*** satellites, or … ***(infrared, X-ray, visible)*** light beams. A network system has the function of

establishing a cohesive architecture that allows almost seamless data … ***(transmission, correlation, deleting)*** while using various equipment types.

Local-area networks and wide-area networks are two basic network types. A local-area network (LAN) is a computer network that … ***(covers, develops, enters)*** a local area. The generally … ***(noticed, accepted, underlined)*** maximum size for a LAN is 1 square km. At present, there are two common wiring … ***(technologies, advantages, programs)*** for a LAN - Ethernet and Token Ring. A LAN typically includes two or more PCs, printers, CD-ROMs and high-… ***(availability, capacity, voltage)*** storage devices, called file servers, which … ***(enable, prevent, determine)*** each computer on the network to … ***(change, access, infect)*** a common set of files. A LAN is controlled by LAN … ***(storage, debugging, operating)*** system software.

A wide-area network (WAN) is a computer network that covers a wide geographical area, … ***(inviting, excluding, involving)*** a large number of computers. The best example of WAN is the Internet, a collection of networks and … ***(gateways, windows, doors)*** linking millions of computer users on every continent. Typically, WANs are used to connect LANs together. WANs are most often built of leased … ***(pages, lines, abstracts).*** At each end of them, a router is used to … ***(interrupt, talk, connect)*** to the LAN on one side and a … ***(hub, hardware, block)*** within the WAN on the other.

XV. Read the website descriptions. To which website does each sentence 1-7 refer?

Internet applications

a) ***paralegal.com*** Fed up with paying exorbitant legal fees? Get leading-edge legal services at a fraction of the cost of going to a law firm. E-mail our legal team for low-cost advice on all aspects of company and tax law. Download specialist up-to-the minute documents for a small charge. Conduct your own court cases with our help and save thousands of euros! No win, no fee!

b) ***bespontaneous.com*** Be spontaneous! Do something on the spur of the moment. Book otherwise impossible-to-get tickets to theatre and sports events. Ready to fly tomorrow? Take a break to one of our popular destinations: beach or city. Worry-free booking by credit card on our secure server. Next-day courier delivery of tickets to your door.

c) ***worldweather.com*** Want to see what the weather's like anywhere in the world? Come to *worldweather.com*! Consult free forecasts for 100 world cities. Download stunning satellite pictures of the world's increasingly unpredictable weather for free. Deluxe, framed versions of these pictures make beautiful gifts. Order on-line. Delivery within 48 hours.

d) ***goinggoinggone.com*** Consumer electronics products auctioned daily: computers, TVs, washing machines, you name it. It's so simple: put in your bid and

we'll notify you by e-mail of the competing bids. You can raise your bid as many times as you like over a three-day period. If your bid is the highest at the end of three days, pay by credit card and goods are delivered to you within 24 hours.

1. You consult this site if you are not sure what clothes to take with you on a trip.
2. This site tries to reassure users who may be worried about giving their credit card details on-line.
3. This site mentions a delivery method that does not use the ordinary post office service.
4. This site does not mention physical delivery of goods or documents.
5. On this site, you can order a picture to put on your wall.
6. On this site, you can offer a price for something, but you won't necessarily get it.
7. On this site, there is a service that you may have to pay for or that may be free, depending on the results.

XVI. Translate into English.

1. Глобальна комп'ютерна мережа охоплює мільйони користувачів у всьому світі. Її було започатковано як військовий експеримент.
2. Ніхто точно не знає скільки людей користується Інтернетом. Їх кількість у світі щомісяця збільшується у тисячі разів.
3. Найбільшою популярністю користується електронна пошта.
4. Більшість людей, які мають доступ до Інтернету, використовують мережу лише для того, щоб надіслати й отримати повідомлення електронною поштою.
5. Користувач сплачує за надані йому послуги провайдеру помісячно чи погодинно.
6. Люди можуть заробляти гроші в Інтернеті.
7. Деякі американські банки та компанії навіть укладають угоди по Інтернету.
8. Блукати по Інтернету у пошуках інформації з усього світу набагато швидше й легшее ніж відвідувати бібліотеки у багатьох країнах.
9. Ви можете також користуватися Інтернетом, щоб читати газети й журнали, грати в ігри, планувати канікули чи робити покупки в улюбленому магазині.
6. Прототип Інтернету у 60-ті роки створило Міністерство Оборони США.
10. Першу спробу з'єднати два комп'ютери з ціллю взаємного спілкування було зроблено у 1969 році.
11. Впершее електронну пошту надіслали у 1972 році.
12. Мультимедійні web сторінки з фотографіями, музикою та відео – привабливі, проте завантажуються вони повільно.

XVII. Render in English.

1. Інтернет-енциклопедія Вікіпедія дозволяє створювати інформаційні сторінки, які б охоплювали будь-яку тему, та безкоштовно користуватися її ресурсами, оскільки вона є відкритим Інтернетджерелом.
2. Більшість соціальних мереж дають можливість зручно та ефективно завантажувати все, що можна перетворти в цифрову форму.
3. Пошук інформації в мережі — це проста дія: необхідно вибрати пошукову систему та надрукувати ключове слово або вираз.
4. Зазвичай програмні продукти цієї фірми-розробника супроводжуються детальними технічними специфікаціями.
5. Інтернет-форуми — це сфера, в якій кожен може спілкуватися з користувачами з усього світу та брати участь ву обговоренні будь-якої теми.
6. Лише ретельна стандартизація Інтернет протоколів дозволить збільшити швидкість передачі даних у мережі в декілька разів.
7. Такі поширені пошукові системи, як Google або Yandex за лічені секунди здатні опрацьовувати величезні масиви інформації.
8. Швидкість передачі будь-якого надрукованого повідомлення в Інтернеті також залежить від пошарової системи Інтернет-протоколів.
9. Інтернет забезпечує єдину фінансову систему, дає можливість як підписувати багатосторонні ділові контракти, так і здійснювати покупки та замовляти побутові послуги.
10. Кожний користувач Інтернету має можливість перечитувати книги більшості бібліотек світу, маючи доступ із власного комп'ютера.

XVIII. Discuss in your group.

1. The Internet is very useful.
2. Problems of the Net.
3. Five broad areas of the Internet.
4. Pro and cons of the Internet.
5. Getting news from the Internet.
6. Internet shops.
7. Communication through the Internet.
8. Earning money through the Internet.

XIX. Prepare a report:
"Global Computer Network, its advantages, areas and popularity".

TEXTS FOR ADDITIONAL READING

I. The Future of the Internet

Everywhere we go, we hear about the Internet. It's on television, in magazines, newspapers, and in schools. One might think that this network of millions of computers around the globe is as fast and captivating as television, but with more and more users logging on every day and staying on longer and longer, this "Information Superhighway" could be perhaps more correctly referred to as an expressway of big city centre at rush hour.

It is estimated that thirty-five to forty millions users currently are on the Internet. According to recent statistics, an average Internet call lasts five times longer as the average regular telephone call. 10 percent of the Internet calls last 6 hours or longer. This can cause an overload and, in turn, cause telephone network to fail. The local network was designed for short calls which you make and then hang up, but Internet calls often occupy a line for hours. With so many users in the Internet it certainly provides new challenges for the telephone companies. The Internet, up to the beginning of the 90s, was used only to read different texts. Then in the early 90's a way was made to see pictures and listen to a sound on the Internet. This breakthrough made the Internet to be most demanded means of communication, data saving and transporting.

However, today's net is much more than just pictures, text, and sound. The Internet is now filled with voice massages, video conferencing and video games. With voice massages, users can talk over the Internet for the price of the local phone call. Nowadays we no longer have to own a computer to access the Internet. Now, devices such as Web TV allow our television to browse the Web and use Electronic Mail. Cellular phones are now also dialing up the Internet to provide e-mail and answering machine services. The telephone network was not designed and built to handle these sorts of things. Many telephone companies are spending enormous amounts of money to upgrade the telephone lines.

K. Kao and G. Hockman were the first to come up with the idea of using fiber optic cables, as opposed to copper wire, to carry telephone signals. Fiber optics uses pulses of light to transmit binary code, such as that used in computers and other electronic devices. As a result, the amount of bandwidth is incredibly raised. Another solution for the problem is fast modems which satisfy the need for speed.

By accessing the Net through the coaxial cable that provides television to our homes, the speed can be increased 1,000 fold. However, the cable system was built to send information one way only. In other words, they can send stuff to us but we can't send anything back, if there is no modem available.

Yet another way is being introduced to access the Internet, and that is through the use of a satellite dish just like the TV dishes currently used to deliver television from satellites in space to your home. However, like cable connection, the information can only be sent one way. Faster ways of connecting to the Internet may sound like a solution to the problem, but just as new lanes on highways attract more cars a faster Internet could attract many times more users, making it even slower than before.

To help solve the problem of Internet clogs, Internet providers are trying new ways of pricing for customers. So, in business time any connection to Net cost more than your connection in the night.

II. Web Design

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

Web pages are created with a special language HTML (Hyper Text Markup Language), which is interpreted by a web browser to produce hypertext, a blend of text, graphics and links. You can view the source or raw HTML code by choosing the View Source option in your web browser. To build a website you could learn how to write HTML tags, the coded instructions that form web pages, or else an HTML editor, a WYSIWYG application that converts a visual layout into HTML code. A simpler option is to use a web template provided by a web-based site builder, where you just fill in the information you want on the page.

Some of the basic elements that can be found on a web page are:

• *Text*, which may be displayed on a variety of sizes, styles and fonts.

• *Links*, connections from text or graphics on the current web page to different parts of the same page, to other web pages or websites, or to external files.

• *Graphics*, pictures created with formats such as JPEG (Joint Photographic Experts Group), which is ideal for pictures with a wide range of colours, e.g. photographs, and GIF (Graphical Interchange Format), which is good for pictures with fewer colours or with large areas of the same colour, e.g. buttons, banners and icons.

• *Tables*, intended for the display of tabular data, but often used to create page layouts.

• *Frames*, subdivisions of a web page allowing the display of different HTML documents on the same page.

Instructions for the presentation, the styling of elements on a page such as text or background colour, can be included in the HTML code. However, it is becoming more common to use CSS (Cascading Style Sheets) to separate style from content. This makes pages easier to maintain, reduces download time and makes it easy to apply presentation changes across a website. Web pages can also include multimedia files: animations, audio and video files. Sounds are recorded with different audio formats. MIDI, AU and MP3 are some of the most popular ones. Shockwave and Flash are technologies that enable web pages to include video and animations. Java applets, specific applications using that programming language, may be used to add

interactivity to web pages. To see or hear all these files, you need to download the right plug-in, the additional software that enables the web browser to support this new content.

III. Netiquette

We expect other drivers to observe the rules of the road and the same is true as we travel through cyberspace. Here are a few pointers to help you out:

- Avoid writing e-mail messages or posting in newsgroups using all caps. IT LOOKS LIKE YOU'RE SHOUTING!
- To add humor and personality to your messages, use smileys, also known as emoticons, expressions you create from the characters on your keyboard. A few popular ones include:

:-)	Happy	:-e	Disappointed
:-(	Sad	:-<	Mad
:-o	Surprised	:-D	Laughing
:-@	Screaming	;-)	Winking
:-I	Indifferent		

- Keep your communications to the point. Some people pay for Internet access by the hour. The longer it takes to read your messages, the more it may cost them. This is true whether you post messages to a newsgroup or a mailing list.
- Remember that anything you post to a newsgroup or type during a chat session is a public comment. You never know who's reading it or who may copy it and spread it around.
- When posting a message to a public bulletin board, forum, or newsgroup, stick to the topic. Don't indiscriminately post unrelated comments or worse advertisements to every newsgroup you can think of. This practice, known as spamming, will quickly lead to another unpleasant Internet practice, flaming. What is flaming? Sometimes you might offend someone unintentionally. Be prepared to receive some angry e-mail or be treated rudely in a public discussion. This is called being flamed. If you attack back, you will spark a flame war. To contain the heat, the best response usually is no response at all.
- If you post an ad to a newsgroup or send it in an e-mail, clearly identify it in the subject line. That way people who aren't interested can delete it.
- Keep messages short, use some common abbreviations: “BTW” means "by the way." A “G” enclosed in brackets indicates grinning.

A good one to keep handy in case you're worried about offending someone is “IMHO” — In My Humble Opinion.

One of our favorites is “ROTFL”, which stands for Rolling on the Floor Laughing.

• FAQs (Frequently Asked Questions) are handy documents to read before asking questions. Always consult them whenever available.

Netiquette isn't something you learn overnight. For an informative guide visit Arlene Rinaldi's Netiquette Home Page.

UNIT 12
Jobs in computing

I. Learn the following words and collocations.

to meet	-	задовольняти, відповідати вимогам
to develop	-	розробляти
to manage	-	керувати, управляти
attention	-	увага
to break down	-	зламатися, вийти з ладу
manageable	-	керований
sole	-	єдиний, виключний, самотній
employer	-	роботодавець
impressive	-	вражаючий, виразний, показний
count for	-	розраховувати на
to enrich	-	збагачувати, поліпшувати
tool	-	інструмент
to succeed	-	досягати успіху, добитися
to staff	-	укомплектовувати
expertise	-	спеціальні знання
to look for	-	шукати
recruit	-	новачок
to make up	-	складати, придумувати, збирати
to improve	-	поліпшити, вдосконалювати
to repair	-	полагодити, відремонтувати
maintenance	-	технічне обслуговування
to handle	-	керувати, обробляти
to amend	-	змінювати, виправляти, полагодити
to retrieve	-	запускати, доставати
crash	-	крах, аварія, поломка
to alter	-	змінити
vehicle	-	транспортний засіб

to be aware of… - бути проінформованим про …
environmental - екологічний, навколишній
to advise - радити, консультувати
customer - замовник, клієнт, покупець
to suit - задовольняти, годитися
to supply - постачати, доставляти
delivery - доставка
to be familiar with … - бути знайомим з …

NOTE:
ICT - abbreviation for "information and communication technology"

II. Read and translate the text.

Jobs in computing

Most ICT-related jobs have developed to meet the need to analyze, design, develop, manage or support computer software, hardware or networks. The primary requirements for being a good programmer are nothing more than a good memory, an attention to detail, a logical mind and the ability to work through a problem in a methodical manner breaking tasks down into smaller, more manageable pieces. However, it's not enough just to turn up for a job interview with a logical mind as your sole qualification. An employer will want to see some sort of formal qualification and a proven track record. But if you can show someone an impressive piece of software with your name on it, it will count for a lot more than string of academic qualifications.

A programmer, or a computer programmer, is a person who writes programs to work on a computer. A programmer can be a specialist in one area of computer programming or a generalist who writes codes for many kinds of programs. Programmers also make, design, and test logical structures for solving problems by a computer. Many technical innovations in programming – modern computing technologies and new languages and programming tools - have changed the role of a programmer and enriched much of the programming work today.

British mathematician Ada Lovelace (who was the famous British poet Lord Byron's daughter) was the first to write a program for a computing machine. The machine was Charles Babbage's Analytical Engine, and Ada wrote and published an algorithm to make the calculations of Bernoulli numbers in October 1842. Unfortunately, her work never ran because Babbage's machine was never finished in her time.

The first person to successfully run a program on a computer was a computer scientist Konrad Zuse, who succeeded in it in 1941. The American ENIAC (Electronic

Numerical Integrator and Computer) programming team, consisting of Kay McNulty, Betty Jennings, Betty Snyder, Marlyn Wescoff, Fran Bilas and Ruth Lichterman were the first regularly working programmers.

There are some other specialties in computing and programming business.

• ***IT managers*** manage projects, technology and people. This means taking responsibility for the maintenance of servers and the installation of new software, and for staffing a help-desk and a support group. Apart from basic hardware and software expertise, an IT manager will typically have over five years' experience in the industry. Since IT managers have to take responsibility for budgets and for staff, employers look for both of these factors in any potential recruit. Nearly all IT managers have at least a first degree if not second one as well. All the people involved in the different stages of development of a computer project, i.e. analysts, programmers, support specialists, etc. are controlled by a project (or IT) manager.

• ***Systems analyst*** studies methods of working within an organization to decide how tasks can be done efficiently by computers. He or she takes a detailed analysis of the employer's requirements and work patterns to prepare a report on different options for using information technology.

• ***Software engineer/ designer*** produces the programs which control the internal operations of computers, converts the system analyst's specification to a logical series of steps, translates these into the appropriate computer language, often compiles programs from libraries or sub-programs, combining these to make up a complete systems program. Software Engineer designs, tests and improves programs for computer-aided design and manufacture, business applications, computer networks and games.

• ***Computer services engineering technician*** can be responsible for the installation, maintenance or repair of computers and associated equipment.

• ***Systems support persons*** are analyst programmers who are responsible for maintaining, updating and modifying the software used by a company. Some specialize in software which handles the basic operation of the computers. This involves use of machine codes and specialized low-level computer languages. Solving problems may involve amending an area of code in the software, retrieving files and data lost when a system crashes and a basic knowledge of hardware.

• ***Application programmer*** writes the programs which enable a computer to carry out particular tasks. He or she may write new programs or adapt existing programs, perhaps altering computer packages to meet the needs of an individual company.

• ***Hardware engineer*** researches, designs and develops computers or parts of computers and the computerized element of appliances, machines and vehicles. He or she is also involved in their manufacture, installation and testing. Hardware Engineer may specialize in different areas: research and development, design, manufacturing. He or she has to be aware of cost, efficiency, safety and environmental factors as well as engineering aspect.

• ***Computer salesperson*** advises potential customers about available hardware and sells equipment to suit individual requirements, discusses computing needs with the client to ensure that a suitable system can be supplied, organizes the sale and delivery and, if necessary, installation and testing.
• ***Computer consultant*** often works on very small timescales – a few days here, a week there, but often for a core collection of companies that keep coming back again and again. There's a lot of work out there for people who know Visual Basic, C++, and so on. And there are lots of people who know it too, so you have to be better than them.

Qualifications are important. Once you've decided which track you want to take, you should consider just how qualified you already are in terms of experience and knowledge. The key question here is experience.

There are three main types of qualifications that will help you in your quest to obtain employment in the database industry or any other IT field. These are experience, education and professional credentials. The ideal candidate's resume describes a balanced mix of criteria from each of these three categories. Every job searcher is familiar with the novice's paradox: "You can't get a job without experience but you can't get experience without a job."

TEXT-BASED ASSIGNMENTS

III.Find the answers to these questions in the text.

1.What are the major requirements for ICT-related jobs?
2. What should a candidate for a position in IT-sphere propose to convince an employer to hire him?
3. Is it true that modern programmers have the same duties as programmers had 10 years ago?
4. What are the main tasks of a computer programmer?
5. Who was the first person to write a program for a calculating device?
6. Who was the first programmer in the history of computing? Prove your opinion.
7. Who were the first regularly working programmers?
8. What are the functions of an IT-manager?
9. What are basic requirements for an IT-manager?
10. What does a System analyst do?
11. What is a Software designer responsible for?
12. Why is it important to have a Computer Technician in staff?
13. Why is it important to maintain and update the software?
14. Who is responsible for this?
15. What is the sphere of professional activity of an Application programmer?
16. What fields may Hardware engineers be specialized in?
17. Who usually helps us when choosing and buying suitable computer equipment?

18. What are the functions of Computer consultants?
19. Is it difficult to find a job for them?
20. What professional criteria play an important role in obtaining employment in IT fields?

IV.Give English equivalents to the words and word expressions using the active vocabulary of the text.

Задовольняти потреби; вимоги до хорошого програміста; увага до подробиць; методично; співбесіда з працевлаштування; керовані частини; послужний список; розраховувати на більше; працювати на комп'ютері; перевірка логічних структур; писати програми для обчислювальних машин; запускати програму на комп'ютері; керувати проектами; взяти на себе відповідальність за…; обслуговування серверів; служба підтримки; група підтримки; поглиблені знання апаратного і програмного обладнання; досвід в галузі; робочі зразки; скласти повну системну програму; вдосконалювати програми; ремонт комп'ютерів та супутнього обладнання; спеціалізуватися на програмному забезпеченні; керувати основними операціями комп'ютера; спеціалізовані комп'ютерні мови низького рівня; завантажувати файли; поломка системи; адаптувати існуючі програми; змінювати комп'ютерні пакети; відповідно до вимог; придатна система; організувати доставку; працювати в невеликі терміни; зайнятість в сфері баз даних; парадокс для початківців.

V.Which computer specialist will do the following:

a) researches, designs and develops computers or parts of computers;
b) maintains the link between PCs and workstations connected in a network;
c) organizes the sale and delivery and, if necessary, installation and testing;
d) writes the programs which enable a computer to carry out particular tasks;
e) studies methods of working within an organization to decide how tasks can be done efficiently by computers;
f) is responsible for maintaining, updating and modifying the software used by a company;
g) manages projects, technology and people;
h) designs, tests and improves programs for computer-aided design and manufacture, business applications, computer networks and games.

VI.Choose the appropriate form of the words to complete the sentences.

1. Mixture, mix, mixed, mixing

A. I always get … up between COBOL and BASIC. This results in syntax errors in my programs.
B. Most sound cards have some kind of … which can be used for adjusting volumes.
C. You will learn to … and master your tracks using the same plugins that top industry engineers use every day.
D. We construct a … analog/digital chaotic neuro-computer prototype system for quadratic assignment problems (QAPs).

2. Supervision, supervising, supervised, supervisor
A. The … is a program which is kept in the memory of a computer to control multiprogramming, timesharing, and input/output functions.
B. The systems analyst insisted on … the junior programmers for the first three months of their work.
C. The project succeeded because of the careful …by the data processing Manager.
D. Apple will continue to add options for controlling … devices.

3. Training, train, trained, trainer, trainee
A. We have three new … in our computer center.
B. To be … at whatever you do in the IT profession, you should never stop learning!
C. … in computer programming is offered by various educational institutions in the evening.
D. After attending whatever classes or seminars his employer offers the software … will begin working by contributing to an assigned project on the application level.
E. It took me two weeks to … myself to use the word processor. Now I can edit letters using my micro.

4. Modification, modify, modified
A. There are numerous problems in updating the existing payroll system due to …that were made to the file structure.
B. Lately, a lot of programs were … to improve their efficiency.
C: When you … the settings of a clustered virtual machine, we recommend that you use Failover Cluster Manager instead of Hyper-V Manager.

VII.Fill in the blanks. Use one of the words given before the text.

a) opportunities, b) include, c) design, d) customers, e) careers, f) experts, g) control, h) the wiring, i) peripheral, j) issue, k) properly, l) determine

There are many career opportunities in the computer industry. Computer engineers are probably the most technically specialized computer **....** Hardware

engineers **...** the circuits that are engraved on chips, and they develop **...** that lets information flow smoothly through the computer. Engineers also design the technical aspects of memory, storage, and **...** equipment.

Computer programmers write the instructions that make computers operate **....** Systems analysts **...** the most efficient use of computers for particular situations. Software publishers **...** programs, write and edit instruction manuals, and provide technical services for **....**

Many careers **...** exist outside the computer industry itself. Data processors who work for companies that use computers enter information into those computers. Workers in many factories oversee computers that **...** machines. Computer training is also an important industry. Some of the industry's most successful individuals are self-taught. But most computers **...** call for a college degree. College courses that help prepare students for careers in computers **...** programming, electrical engineering, systems analysis, and data processing.

VIII.Choose the appropriate words in brackets.

Becoming certified

Suppose you're a **…** ***(support, suspect, sustain)*** engineer. You're **…** ***(cheerful, stuck, luxuriate)*** in a job you don't like and you want to **…** ***(reduce, skip, make change)***. One way of making that change is to **…** ***(shorten, improve, truncate)*** your marketability to potential **…** ***(employers, acquaintances, kinsfolk)*** by **…** ***(upholding, upgrading, upswinging)*** your skill-set. Microsoft offers a large array of certification programs **…** ***(hooded, antiquated, aimed)*** at anyone from the user of a single program such as Microsoft Word, to someone who wants to become a **…** ***(certified, unclaimed, asserted)*** support engineer. If you're the proud holder of any of those qualifications, then you're **…** ***(received, entitled, refused)*** to call yourself a Microsoft Certified Professional (MCP).

In this question experience is very important. This will not only **…** ***(influence, parley, cancel)*** the amount of work you'll have to do for the exams, it could also mean the difference between **…** ***(passing, walking, crossing)*** or failing the exam. While you're busy learning all you need to know for your **…** ***(patent, reference, certification),*** the practice exams are an absolute godsend. They show you the type of questions you'll **…** ***(encounter, constitute, reformat),*** and they **…** ***(upgrade, familiarize, moderate)*** you with the structure of the exam. This is **…** ***(transiently, essential, lucidly)*** if you want to pass: the exams have time limits, and you need to get **…** ***(away, used, hold)*** to answering the requisite number of questions within the **…** ***(clipped, forgotten, allotted)*** time.

If you decide a training course will help you out, don't let the title of a course alone **…** ***(constellate, convince, converse)*** you that it will be **…** ***(suitable, sublime,***

succulent) or cost effective. Find out exactly what the course offers, and whether there are prerequisites for **…** ***(spectators, attendants, setters)***. You should also find out what the training company is prepared to do if attendants don't have the minimum knowledge **…** ***(inessential, minor, necessary)*** to be on the course.

As exams are **…** ***(replaced, publicized, desiccated)*** by 'updated' ones, you need to upgrade your certification to stay **…** ***(attractive, current, trendy)***. Ultimately it's your **…** ***(respiration, responsibility, restitution)*** to make sure you stay up to date. If you don't, you lose your certification until you take an **…** ***(upcast, upright, upgrade).***

As a support engineer, you get the **…** ***(allowance, satisfaction, detriment)*** of knowing that you passed a tough test, and the happy knowledge that your network manager is sweating a bit over the fact that you could be head-**…** ***(cured, hunted, on)*** at any time.

IX.Put the words in brackets into the proper forms to fill the gaps.

I.

Building your brand … ***(requirement)*** stylish web design and nearly flawless … ***(to implement).*** Without employing the help of a web … ***(development)*** with honed skills, your online identity will surely … ***(suffering).***

A front-end web developer is akin to a … ***(design).*** They code webpages with HTML, CSS and JavaScript, crafting the … ***(stylish)*** of your webpage. Back-end web developers query databases and … ***(utilization)*** programming languages like PHP or Python to do so. They take your beautifully crafted website and … ***(ensurance)*** it sits soundly on a … ***(functionality)*** server. Full-stack web developers … ***(marriage)*** the two positions, juggling both roles in a single job. Often, they are more … ***(expense),*** but they can help … ***(elimination)*** communication problems as your team builds websites.

At the moment, a custom website usually runs around $5,000 to $10,000, according to Web Builder Expert. The … ***(complex)*** of your site will largely … ***(determination)*** how much time it will take to … ***(developer),*** and may act a predictor of its cost. Typically, … ***(builder)*** a website will take a team 12 to 16 weeks, but the process can take up to six months.

II.

Networks now permeate the sciences and are used in mainstream areas such as big-data **…** ***(analytical),*** the Internet of Things (IoT), cyber-physical systems, autonomous systems, some forms of AI and cyber- **…** ***(secure).*** There is a need for software **…** ***(engineering)*** who have networking **…** ***(expert)*** in these areas. Nevertheless, there will still be a need for traditional software engineers, programmers, and app developers, who won't **…** ***(occupation)*** the top tiers of software **…** ***(developer)*** but will still fare well.

To obtain a good position an applicant must **…** ***(demonstrational***) in his interview that his good software-engineering background is not only one of the **…** ***(value)*** elements that he offers an **…** ***(to employ).*** Employers want more than good grades in **…** ***(advancing)*** courses. Many employers only hire people who have a passion for solving hard problems and are willing to work until they are **…** ***(to solve).***

If an **…** ***(application)*** wants to work in a place where software is not the core product or service, such as a government agency, he should understand that the organization will probably **…** ***(consideration)*** software engineers as just part of the IT infrastructure with less job **…** ***(flexible).*** If he wants to work in a place where software is the core product or service, he should understand ideas such as Agile and Scrum, as well as the relationship between testing and coding. With this type of organization, he'll have more **…** ***(responsible)*** for **…** ***(innovator)*** and ingenuity, and thus more job **…** ***(flexible).***

X.Study these job requirements. Try to match the requirements to the list of jobs.

a) Visual Basic Developer	***b) IT Engineer (Network and Database)***
c) Web Developer	***d) Network Support***
e) E-commerce Consultant	***f) Team Leader***

1) at least 5 years (2 at senior level) in: Unix, SYBASE or ORACLE, NT or Windows 2000, Terminal Server, TCP/IP, Internet; strong project management (2 years); willingness to travel abroad;
2) able to manage, lead and develop a team; knowledge of C, C++, Delphi; experience of object-oriented design within a commercial environment; ability to deliver software projects against agreed schedules and within agreed estimates;
3) proven track record in the delivery of resolutions in banking environment; knowledge of Unix, NT and Oracle; willingness to travel internationally;
4) minimum 4 years of lifecycle development experience; demonstrable skills using VB, SQL, RDBMS; able to develop core s/w; excellent communication skills;
5) minimum of 18 months of commercial experience of Web development; knowledge of HTML, Java, ASP; full portfolio of URLs as examples;
6) experience of NT, Exchange, SQL Server, Monitoring Software, Verta, TCP/IP; solid grasp of networking; 2 to 5 years of experience in a network environment.

XI.Read the quotes and write the name of the students by the jobs they want.

1. Web designer _____
2. Computer programmer _____
3. Database administrator _____
4. E-commerce manager _____

Elissa: "I'm interested in writing software. My friends say I'm a techno-nerd because I prefer working with computers to people. Money is important but I'd rather do a job I enjoy. I want to take a distance-learning course so I can study at home."

Katie: "I like shopping and I think the future of business is on the Internet. I'm good with computers, but I also like working with people. I'd like to manage my own online company. This will give me a lot of responsibility. E-commerce comes with risks, but rewards are high when you succeed."

Martin: "Many people like Web design, but I think data management gives more job security. There is so much information on the internet, and companies need people who know how to store, manage and retrieve data. I want to get my degree and work for a good company."

Peter: "I'm using Java-script to make my website more interactive. After college, I'd like to try telecommuting. This is working at home, using e-mail to communicate with clients. I want freedom, flexibility and long holidays, which you don't get by working in an office."

XII.Reading.

If you want to apply for a job you should present the information about yourself correctly. You can do this with the help of CV. Study the example of CV proposed below and define all main parts of it.

Curriculum Vitae

Profile:

Self-motivated, responsible and ambitious.
Skilled organizer and problem solver with the ability to consider options with an open mind before making a decision.
Determined to achieve results and be successful

Education:

2003 – 2006 Computing with Business Management (BSc) at Kingston University.

Subjects studied: Operating System Networking, Management Accounting, System Analysis & Design, Accounting in a Business Context, Introductory Data Analysis, Business Modelling and etc.

2000 – 2003 A/S Maths & AVCE Information Communication Technology at Harrow College

Main modules included: Creating and managing website, Spreadsheet, Networking, Presenting Information, Visual Basic, Graphics and etc

1998 – 2000 GCSE at Harrow High School 10

Including Maths, English/ English Literature, Humanities, Art, Science, French and Technology

1999 – 2000 Diploma of Vocational Education in Art and Design Experience

15.08.06 – 15.08.2007 Ocean Exchange UK Ltd: Data Entry Administrator

Main Duties: Administration of inbound and outbound data – Logging, checking and storing. Data Manipulation – Formatting, verifying and preparation ofelectronic data using MS Excel, MS Access Data Reporting – Delivery of internal reports on database compilation.

12.03.01 to Present Primark Stores Ltd: Sales Advisor

Involved in all aspects of customer service, including: answering questions, problem solving and providing assistance to the customers.

Computer skills:

Highly proficient in using the following software packages: Microsoft Word, Excel, Access, Front

Nationality: British

Marital Status: Single

Referees:

Professor Jones, Kingston University, Penrhyn Road, Kingston upon Thames Mr Burke (Store Manager) Primark Stores Ltd, 13 St Ann's Shopping Centre, St Ann's Road, Harrow.

XIII.Study the CV of Paul. Then write your own CV in the same way.

CURRICULUM VITAE

Paul W Cair

Personal details:

Date of birth: 30/5/79

Address: 7 Linden Crescent, Stonebridge EH21 3TZ

Email: p.w.cair@btinternet.com

Education:

1991-1995 Standard grades in Maths, English, Spanish, Computer Studies, Geography, Science, James High School

1996-1997 HNC in Computing Maxwell College

1997-1999 HND in Computing Support Maxwell College

Work experience: IT support consultant Novasystems. Novasystems is an IT company that provides a complete range of computing services for its corporate clients.

My experience includes:

- advising clients on IT issues and strategies;

-1st line customer telephone support;
- configuration and installation of hardware and software to clients' specifications;
- network administration and implementation;
- PC assembly.

I have knowledge of these areas:

- Windows 2000 Server/Professional
- Office 97, 2000
- Sage Line 50 & 100
- Windows 95/98
- TCP/IP Networking
- Windows NT4 Server/Workstation
- Exchange Server 5.5

XIV.Translate into English.

1. Існує стереотип, що всі айтішники – це програмісти, але це не так. IT-галузь об'єднує в собі досить багато різнопланових професій, в тому числі й "нетехнічних".
2. Тестувальник - спеціаліст, який, немов слідчий, спостерігає й вивчає, як працює програма, і шукає в ній помилки.
3. Менеджер проекту - свого роду польовий командир, який очолює робочий процес: визначає пріоритети, ставить завдання, контролює їх виконання та вирішує оперативні питання.
4. Бізнес-аналітик - аналізує бізнес і процеси, що підлягають автоматизації.
5. Системний адміністратор – його основним завданням є налагодження та забезпечення стабільної роботи комп'ютерного парку.
6. Дизайнер - "цифровий" художник, який створює зовнішній вигляд програм, веб-сайтів, додатків тощо, основне завданням якого є вирішення потреб користувача.
7. Team lead - управляє «бригадою» розробників, розуміється на технічній стороні, контролює якість роботи та вирішує найбільш складні завдання на проекті.
8. Архитектор – займається проектуванням інформаційних систем.
9. Програміст – інженер, який займається безпосереднім "будівництвом" IT-об'єктів – написанням програмного коду певною мовою програмування (наприклад, Java, PHP, Python).
10. IT продажі - дослідник та продавець відповідають за знаходження нових клієнтів для компанії-роботодавця.

XV.Render in English.

IT сфера – це сфера, яка продовжує стрімко розвиватися. Для того, щоб потрапити в IT сферу не обов'язково закінчити прикладну математику чи спеціальний факультет комп'ютерних наук, можна просто перекваліфікуватись на спеціалізованих курсах, де ви вивчатимете лише те, що Вам насправді знадобиться в роботі. Як правило, на хороших курсах викладають IT спеціалісти-практики, які весь день працюють в IT компанії над реальними проектами, а ввечері діляться досвідом зі своїми студентами.

Для того щоб стати розробником програмного забезпечення, необхідно мати аналітичний склад розуму, мислити алгоритмами, вміти прораховувати кілька кроків на перед.

Щоб стати веб-дизайнером варто мати задатки творчого мислення, вміти бачити те, що не помічають інші, мати дуже добре розвинуте почуття смаку та колористики, а також вміти працювати з певними програмами.

Також цінуються вміння аналізувати, чіткість висловлювання, послідовність, відповідальність, наполегливість, комунікабельність, бажання зробити продукт кращим, адже основним завданням спеціаліста з забезпечення якості є висока якісь кінцевого продукту, який потрапляє до рук споживача чи безпосереднього замовника.

Англійська мова для IT спеціаліста будь якого рівня є надзвичайно важливою тому що дозволяє порозумітися із замовником та усіма учасниками проекту на стороні замовника. Тому вивчення англійської мови є просто необхідним.

XVI.Work with the Internet.

Surf the net and find information about the advantages of the profession of a programmer and the peculiarities of the programmers' training courses at different universities.

XVII.Individual work.

Have you chosen an appropriate job for yourself?
What responsibilities are you suitable for? Here you can find some ideas:

• to work on the full range of development activities – analysis, design, coding, testing and implementation;
• to perform formal analysis of operational needs;
• to run data-processing equipment (data control and editing);
• to facilitate systems integration;
• to provide messaging, data storage, networking;
• to develop and maintain web-based applications;
• to possess analytical problem solving skills;

• to handle customer support calls;
• to set up equipment;
• to maintain security of documents and customers;
• to install, configure and maintain software and hardware systems;
• to assess potential risks;
• to conduct trainings to new hires, users and technical teams as needed;
• to analyze system issues and provide resolutions;
• to recommend process improvements;
• to ensure system reliability, security, integrity and performance;
• to conduct computer diagnostics.

XVIII.Group work. Role play the following situation.

You have read one of the above job advertisement in IT sphere in the newspaper. You are looking forward to getting this job. Pay a visit to that company and ask for more information.

TEXTS FOR ADDITIONAL READING

I. Web designer-developer

Summary

Relief International, a humanitarian non-profit agency with the vision and commitment to saves lives and sustaining livelihoods, is currently in search of Web designer/ developer. This position is based in Los Angeles, California. Under the supervision of the Executive director, the incumbent is responsible for developing, organizing, implementing, and maintaining Web services for the company. The incumbent will provide technical support and assist in the implementation and maintenance of company computing systems. The incumbent also provides on-going technical and analytical support to end-users and colleagues.

Primary Responsibilities:

•Develop and maintain web-based applications utilizing strategic, technical and user-friendly approaches.

•Utilize web and graphics development technologies to produce and implement internet and intranet solutions.

•Communicate and collaborate with staffs to develop recommendations for web-related services.

•Keeping up-to-date on the latest web site, user experience, and production technologies and proven best practices.

•Meticulous testing and troubleshooting of web pages across multiple browsers, platforms, operating systems.

•Produce and deploy electronic newsletters that include a diverse set of articles; be knowledgeable about common email delivery software, metrics and best practices.
•Consult with managerial and technical personnel to clarify problem intent, identify problems, and suggest changes.

Qualifications:

•Equivalent to a bachelor's degree from an accredited institution in computer science or related field.
•Two to four years of experience in web design.
•Knowledge of Content Management Systems, PHP, HTML (hand coding, Dreamweaver and FrontPage), CSS, Javascript, Flash, and, ActionScript, MySQL/SQL/ XML/ XHTML.
•Facility with all web publishing and common design programs including Quark, InDesign, Photoshop, Illustrator, Acrobat and other design tools.
•Experience developing user interfaces, layouts, branding, flash animations, other digital media to facilitate the distribution of digital information to all stakeholders.
•Knowledge of common email delivery software, metrics and best practices.
•Must possess analytical problem solving skills, and demonstrate the ability to handle projects.

II. Database Administrator

Job Summary

All database positions in the company form the sub-department of IT known as "Information Services". The overall task of IS is to oversee all aspects of data entry, create and maintain reports, queries, and provide first-level data analysis to all departments, based on need. IS the primary contact for all aspects of TrakQuip and all Microsoft Access databases.

The position of Senior Database Analyst will oversee the overall progress of Information Services. The Senior Database Analyst's primary focus will be working on larger projects that serve the company's strategic needs, and devising and implementing strategies for data entry and data consistency. This position will also be ultimately responsible for all work done by Information Services.

Essential Duties and Responsibilities:

• Supervising, training, setting priorities, and reviewing progress of Junior Database Analyst. As the Junior Database Analyst will report directly to the Senior Database Analyst, it will be important to ensure that the flow of communication between Information Services and the rest of the company is consistent.
• Resolving software issues.
• Setting priority of all projects.
• Maintaining SQL databases.
• Overseeing creation of Access databases.

• Considering data entry strategy and other procedural items.

Desired Minimum Qualifications, Education and Experience:

• 4 years college degree, not necessarily in a related field.
• 4 years related experience, not necessarily in a related field or industry.
• Advanced knowledge of database structure.
• Proficiency with SQL/T-SQL language, Exp. w/VBA conversion to .net, ASP.net, XML, Documentation, Sharepoint & Webparts Development, Source Safe.
• Advanced knowledge of MS Access and programming in Visual Basic for Access.

Necessary Knowledge, Skills and Abilities:

• Advanced knowledge of Microsoft Word, Access, Excel.
• Problem solving skills.
• Concepts of intermediate math.
• Ability to handle multiple tasks.

III. THE RULES OF THE RESUME GAME

Resume writing is like tennis in that certain rules apply. The tennis court is a specific size. The net is a standard height. You can remove the net and hit the ball, but then you're not playing tennis. Similar conventions apply to resume writing. You can make up your own rules as you go along.

Here are the features of the resume that always produces interviews and job offers:

- It's accomplishment-oriented. Everything on the page is built around your achievements. They are its only reason for being.
- It's organized. Things aren't dropped in helter-skelter. Information falls under easily understandable general headings, which makes it easy to find facts.
- It's broken down into sub-headings. No long paragraphs.
- It's concise, not wordy. It's written in crisp phrases, not full sentences. In resume language "K" means thousand, "M" means million, and "MM" means hundred million. Thus, $27K means 27 thousand dollars. Omit words like “a”, “an”, and “the” and “I”, “me” and “my”. Otherwise, don't abbreviate.
- It's written on one or two full pages, nothing else. Half-page or 1-1/2 page resumes look like you ran out of steam or didn't plan well.
- It's normally limited to two pages, except for the occasional senior executive resume, which can go to three. Getting it onto two pages is part of the drill.
- It's packed with important details. Nothing irrelevant. No personal data is included, except when there is an important reason to do so (for example, when industry standards require it). Let the resume simply show where you've been and what you've accomplished. That's its job. Don't say anything about references, age, marital status, references, sex, race, family, personal interests, political or religious affiliations — unless mentioning these things will help.

- It's typed or word processed - never handwritten - and it's laser printed on plain white bond paper. Nothing else very clean photocopies onto good bond paper are more than adequate.
- It's one-of-a-kind, not canned. It's not done by a resume service.
- It's conservative, because business is conservative.
- It's flawlessly clean. No typos, no misspellings. No white-out. One Human Resources Manager said he trashes all letters and resumes with even one spot of white-out. Perhaps short sighted, but that's reality.
- It's interesting, provocative, and enthusiastic. Not boring.
- It's weighted to emphasize recent work experience. As a general rule, employers care most about what you've done recently, say within the last ten years. They care less about what you did earlier. (Exception: when something 10 or 15 years ago bears directly on their needs today.) So if you look at a well-written resume visually, it looks like an inverted pyramid. Your most recent experience receives the most attention (space), and earlier jobs get less attention (space) as you go backwards in time.

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