

## Unit I. INFORMATION SYSTEMS AND TECHNOLOGIES

### VOCABULARY STUDY

#### Word List

##### *Nouns and noun phrases*

Data – данные; subset – подмножество; degree of commonality – степень унификации; hierarchy – иерархия; transfer – перенос; semiconductor – полупроводник; definition – определение; processing – обработка; application – применение, приложение; information systems umbrella – система обобщённых компонентов информационной системы; per say – в буквальном смысле.

##### *Adjectives*

Electronically mediated communications – электронные устройства для передачи информации; multidisciplinary – многопрофильный; interdisciplinary – междисциплинарный; constituent – составляющий компонент.

##### *Verbs*

Store – хранить; retrieve – извлекать; transmit – передавать; manipulate – манипулировать, обрабатывать; facilitate – упрощать, облегчать; encompass – охватывать; establish – основывать; disseminate – распространять; implement – осуществлять; evolve – развивать, формировать; herald – объявлять, возвещать; harness – укрощать, использовать, приспособливать под свои нужды.

#### **I. Match the words with the definitions below.**

*Commonality, harness, umbrella, constituent, distribution, establish, retrieve, application, herald.*

1. A way in which something can be used for a particular purpose.
2. To find and bring back something; to get stored information from a computer.
3. The sharing of a set of features, or a particular feature that is shared.
4. The process of giving things out to several people, or spreading or supplying something.
5. To cause something or someone to be accepted in or familiar with a place, position, etc.
6. Something that includes or represents a group or range of similar things.
7. Relating to one of the parts that a substance or combination is made of.
8. A sign that something will happen, change, etc.
9. To control something, usually in order to use its power.

#### **II. Using a dictionary add as many words as possible into the table.**

<i>Verbs</i>	<i>Adjectives</i>	<i>Nouns</i>
1. to compute		

2.		application
3. to communicate		
4.	programmable	
5.		establishment
6. to implement		
7.		simulation

**III. Choose the words with similar meaning from the two groups and arrange them in pairs.**

A. Hierarchy, information, computer, established, umbrella, multidisciplinary constituent.

B. Part, hardware, field, name, level, transfer, systems.

**IV. Complete the sentences with the words below.**

*Transform, promising, information, implement, principles, overlapped, software, programmable, compiling, calculations.*

1. Computer programming deals with the design of ... .
2. I didn't think that Information Technologies often ... with bionomics (i.e. ecology).
3. The term "computer" was originally given to humans who performed numerical ... using mechanical calculators, such as the abacus.
4. Charles Babbage was a famous English mathematician, who first proposed a ... machine.
5. Social informatics is considered to be a ... discipline.
6. Some of the individuals will become skillful enough to ... the information into knowledge.
7. I knew all main ... of predicate logic at the exam yesterday.
8. The computer and the resultant Information Age heralds a time when every person can harness more .... in practical ways than ever before.
9. By the first of September they will have been working at ... this program for 15 months.
10. The idea to ... Information Technologies into teaching process has attracted the attention of the academic staff.

**V. Make up your own sentences using the following words and word combinations.**

Information and communications technology (ICT), electronically mediated communications, information distribution technologies, established name, techniques for processing, simulation of higher-order thinking, information systems umbrella, interdisciplinary computer science field.

**VI. Translate into English.**

Как сегодня используются компьютеры?

Сегодня компьютеры выполняют работу, которая раньше была сложной, намного проще. Например, вы можете написать письмо в текстовом редакторе, отредактировать его в любое время, проверить орфографию, распечатать копии и отправить кому-то по всему миру за считанные секунды. Все эти действия раньше заняли бы у кого-то дни, если не месяцы. Кроме того, эти примеры — лишь малая часть того, что могут сделать компьютеры.

#### *A. TEXT STUDY*

##### **I. Read the text and answer the following questions.**

1. What unites computers, television and telephones?
2. The term Information technology is a peculiar one, as it appeared in modern sense in about 3000 BC, isn't it?
3. What are computers applied in information technology for?
4. What are the categories of the Information technology?
5. What is a subset of information and communications technology?
6. How did the Sumerians in Mesopotamia store, retrieve and manipulate information?
7. What is the definition of IT?
8. Why is it possible to present a pencil and a piece of paper as an information system example?
9. What is the main function of an Information System?

#### **Text A. Information Systems and Technologies**

Information technology (IT) is the application of computers to store, study, retrieve, transmit, and manipulate data, or information, often in the context of a business or other enterprise. IT is considered as a subset of information and communications technology (ICT). In 2012, Zippo proposed an ICT hierarchy where each hierarchy level contains some degree of commonality in that they are related to technologies that facilitate the transfer of information and various types of electronically mediated communications.

The term IT is commonly used as a synonym for computers and computer networks, but it also encompasses other information distribution technologies such as television and telephones. Several industries are associated with information technology, including computer hardware, software, electronics, semiconductors, internet, telecom equipment, and e-commerce.

Humans have been storing, retrieving, manipulating, and communicating information since the Sumerians in Mesopotamia developed writing in about 3000 BC but the term IT in its modern sense first appeared in a 1958 article published in the Harvard Business Review. Its authors Harold J. Leavitt and Thomas L. Whisler commented: "The new technology does not yet have a single established name. We shall call it information technology (IT)". Its definition consists of three categories: techniques for processing, the application of statistical and mathematical methods to

decision-making, and the simulation of higher-order thinking through computer programs.

The conception of IT is closely associated with Information Systems. IT falls under the information systems umbrella but has nothing to do with systems per say. IT deals with the technology involved in the systems themselves, e.g. an information system contains many information technologies such as servers, server operating systems, web server software etc.

An Information System (IS) is a large umbrella referring to systems designed to create, store, manipulate or disseminate information. An example of an information system is a pencil and a piece of paper. The two objects themselves are just tools, but together they create a system for writing information. IS is implemented within an organization for the purpose of improving the effectiveness and efficiency of the organization. Capabilities of the information system and characteristics of the organization, work systems, people and development methodologies together determine the extent to which that purpose is achieved.

As an area of study IS and IT include the multidisciplinary business field and the interdisciplinary computer science field that is evolving toward a new scientific discipline. IS and IT course is a broader field that includes computer science course as its main constituent part.

## **II. Choose the best option to the following statements.**

1. Computers are ...
  - a) the most important part of our life;
  - b) an essential part of our life;
  - c) very friendly to users.
2. As an area of study IS and IT includes...
  - a) the multidisciplinary industrial field and the interdisciplinary computer science field;
  - b) the multidisciplinary business field and the interdisciplinary computer science field;
  - c) the multidisciplinary social field and the interdisciplinary computer science field.
3. Computers have different ...
  - a) bacterium;
  - b) viruses;
  - c) worms.
4. An example of an information system is ...
  - a) a pencil and a piece of paper;
  - b) a set of writing;
  - c) a calculating table.
5. An information system contains ...
  - a) many information technologies;
  - b) many computers;
  - c) many manufacturing technologies.

6. ... to decision-making is the main task of an analyst-programmer.
  - a) The developing new solutions;
  - b) The application of new software;
  - c) The application of statistical and mathematical methods.
7. The term IT is commonly used as ...
  - a) a synonym for computers and computer networks;
  - b) a synonym for computers and computer software;
  - c) a synonym for iPod and computer networks.
8. With the help of computers users...
  - a) get control to the Internet;
  - b) get access to the Internet;
  - c) lose access to the Internet.
9. Information technology is ...
  - a) the application of computers to store, study, retrieve, transmit, and manipulate data;
  - b) the application of computers to store, study, retrieve, transmit, and manipulate people;
  - c) the application of computers to store, study, retrieve, transmit, and manufacture data.
10. The term IT in its modern sense first appeared ...
  - a) in a 1958 article published in the Harvard Business Magazine;
  - b) in a 1958 article published in the Harvard Business Review;
  - c) in a 1958 article published in the Harvard Business Review Journal.

**III. Comprehension Check. State whether the statements are true or false. Correct if necessary.**

1. Information technology is the theory and practice of using computers to store and analyze information.
2. Each level in the ICT hierarchy proposed by Zippo contains some degree of particularity in that they are related to technologies that facilitate the transfer of information.
3. The term computer network is very closely associated with the term Information technology.
4. Television and telephones are within the compasses of the term IT.
5. Information technology is a broad notion as it embraces computer hardware, software, electronics, semiconductors, internet, telecom equipment, and e-commerce.

**IV. Fill in the necessary prepositions.**

1. The term Information technology in its modern sense first appeared ... a 1958 article.
2. IT deals with the technology involved ... the systems themselves.
3. The term IT is commonly used ... a synonym ... computers and computer networks.
4. An ICT hierarchy is where each hierarchy level contains some degree ...

commonality in that they are related ... technologies that facilitate the transfer of information. 5. Information technology is the application ... computers to store, study, retrieve, transmit, and manipulate data often ... the context of a business enterprise. 6. The conception of Information technology is closely associated ... Information Systems. 7. Due ... computers modern medicine can diagnose diseases faster and more effectively. 8. With the help of computers we get access ... the Internet.

## **V. Fill in the necessary articles.**

1. Workers use handheld computing devices to collect data at ... customer site, to generate forms, to control inventory. 2. With small computing devices available for controlling ... flow of information in ... organization people are able to spend more time being active. 3. Computers can help ... people work more creatively. 4. Multimedia combines ... text with sound, video, animation and graphics, which greatly enhances ... interaction between user and machine. 5. Personal computers have ... potential to significantly improve ... way we relate to each other. 6. Many people today telecommute – that is, use their ... computers to stay in ... touch with ... office while they are working at ... home. 7. With ... proper tools, hospital staff can get ... diagnosis from ... medical expert hundreds or thousands of miles away. 8. ... disabled can communicate more effectively with others using computers.

### ***B. TEXT STUDY***

**I. You are going to read an article about types of computers. 5 sentences have been removed from the article. Choose from the sentences A–F the one which fits each gap (1–5). There is one extra sentence which you do not need to use.**

**A.** These devices usually do not have keyboards but rely on touchscreen technology for user input.

**B.** Their low cost means they're cheaper than almost any brand-new laptop you'll find at retail outlets. However, the internal components are less powerful than those in regular laptops.

**C.** Servers allow many computers to share a printer or other devices without the cost of having to buy one for every computer.

**D.** PCs were first known as microcomputers because they were a complete computer but built on a smaller scale than the huge systems in use by most businesses.

**E.** Many of today's great movies use supercomputers for their CGI.

**F.** The glasses can stream information to the lenses and allow the wearer to send and receive messages through voice commands.

## **Text B. Types of Computers**

There are a lot of terms used to describe computers. Most of these words imply the size, expected use or capability of the computer. While the term computer can apply to almost any device that has a microprocessor in it, most people think of a computer as a device that receives input from the user through a mouse or keyboard, processes it in some fashion and displays the result on a screen. Do you know the different types of computers?

**PC.** A single person defines the personal computer, or PC, as any computer designed for general use by one person. While a Mac is a PC, most people relate the term with computers that run the Windows operating system. (1) Personal computers come in many forms, including the new Apple iPad.

**DESKTOP.** A PC that is not designed for portability is a desktop computer. The expectation with desktop systems is that you will set the computer up in a permanent location, like a desk or table. Most desktops offer more power, storage and versatility for less cost than their portable brethren.

**LAPTOP.** Also called notebooks, laptops are portable computers that mix the display, keyboard, a pointing device or trackball, processor, memory and hard drive all in a battery-operated package slightly larger than an average hardcover book.

**TABLET COMPUTERS.** Tablet Computers are ultra-portable computers that are even smaller than traditional laptops. (2) Recent improvements to tablet computers have allowed users to view HD video, get high quality sound, great photo capabilities, and the ability to share information, photos, and videos with anyone.

**SMARTPHONES.** Smartphones are handheld-sized computers that often use flash memory instead of a hard drive for storage. (3) Smartphones are typically smaller than a paperback novel, very lightweight with a reasonable battery life. Smartphones have the same capabilities as tablet computers, but also allow users to text or make phone calls.

**WORKSTATION.** Another type of computer is a workstation. A workstation is simply a desktop computer that has a more powerful processor, additional memory and enhanced capabilities for performing a special group of tasks, such as 3D Graphics or game development. They may even use multiple screens to enhance their viewing.

**SERVER** A computer that has been optimized to provide services to other computers over a network. Servers usually have powerful processors, lots of memory and large hard drives. (4) Servers also allow users to share information and files with each other. The computers in this lab are part of a network.

**MAINFRAME** In the early days of computing, mainframes were huge computers that could fill an entire room or even a whole floor! As the size of computers has diminished while the power has increased, the term mainframe has fallen out of use in favor of enterprise server. You'll still hear the term used, particularly in large companies to describe the huge machines processing millions of transactions every day. Mainframes store vast amounts of information.

**SUPERCOMPUTER** This type of computer usually costs hundreds of thousands or even millions of dollars. Although some supercomputers are single

computer systems, most are composed of multiple high-performance computers working in parallel as a single system. Supercomputers are the fastest, most powerful, most expensive computers made today. The best-known supercomputers are built by Cray Supercomputers. They can perform over a trillion calculations per second.

**WEARABLE COMPUTERS** The latest trend in computing is wearable computers. Essentially, common computer applications (e-mail, database, multimedia, calendar/scheduler) are integrated into watches, cell phones, visors and even clothing. Users can use these devices for health and fitness, navigation, social networking, and gaming. Google can now augment a person's vision through special computer glasses. (5) There is also a built-in camera to record video and take pictures.

## **II. Read the text and answer the following questions.**

1. Enlist the types of computers.
2. What are the forms of personal computers?
3. What does server provide?
4. What stores vast amounts of information?
5. What is latest trend in computing? Give examples.

## **III. Give the main points of the text in 4-7 sentences. Use the following clichés:**

*The information presented in the text... . On the one hand ..., on the other hand ... There was some new information for me... . I find this text ... . I like (dislike) the text ... .*

## **IV. Fill in the gaps with prepositions where necessary.**

The first thing that you will notice 1)\_\_\_ tablet PC's is that they do not feature a physical keyboard. Many on-screen keyboards take 2)\_\_\_ the bottom half 3)\_\_\_ the screen, when being used and will give you some loss 4)\_\_\_ usable screen size. The keyboards on laptops are much better 5)\_\_\_ anyone who does a lot 6)\_\_\_ typing. The trackpad 7)\_\_\_ laptop computers is a touch sensitive area about 3 inches 8)\_\_\_ 2 inches 9)\_\_\_ size. Directly below the trackpad are two small buttons used 10)\_\_\_ right and left click.

## **V. Translate from Russian into English.**

За последние 50 лет постоянно расширялась сфера применения компьютеров, при этом можно выделить несколько этапов этого процесса.

Первый этап: применение цифровых систем, прежде всего компьютеров, для решения сложных вычислительных задач, связанных с большим объемом расчетов. В их числе задачи моделирования процессов, которые сложно воспроизвести физически.



Второй этап: использование компьютеров совместно с теми или иными изделиями с целью мониторинга их состояния или задействование их в бизнес-процессах для надежного хранения информации, ее быстрого извлечения в удобной форме и передачи по каналам связи. Компьютеры, однако, непосредственного влияния на изделия или процессы не оказывают. Управление изделиями или процессами остается прерогативой людей. Основу компьютерного парка на втором этапе составляют персональные компьютеры и их сети.

Третий этап: встроенные компьютерные системы, управляющие работой изделий и их совокупностей, а также выделенные компьютерные системы, непосредственно функционирующие для достижения целей того или иного процесса. На третьем этапе цифровые системы имеют целевую функцию, совпадающую с целевой функцией изделия или процесса. Можно сказать, что разделить цифровую систему и изделие или процесс теперь невозможно. Компьютеры встраиваются буквально во все — от пылесосов, телефонов и микроволновых печей до высокотехнологичных производств. Более того, компьютеры теперь ближе и к человеку, они становятся персональными, а затем — с уменьшением в размерах — носимыми и мобильными. Сегодня уже есть примеры того, что микропроцессоры начали вживлять в человеческое тело.

## **VI. Conversational Practice. Read the dialogue.**

### **Computers in our Life**

Bernard: Hello! How are you?

Jack: Hi. I'm fine. And you?

Bernard: I'm OK. What are you doing?

Jack: I'm writing an essay.

Bernard: What is the essay about?

Jack: It's about the role of computers in our life.

Bernard: Oh, it's interesting. Is it positive or negative?

Jack: Of course, it's positive. Personally, I think that computers have only advantages.

Bernard: To be honest, I don't agree with you.

Jack: Why? Nowadays we can't imagine our life without them. They are our brain.

Bernard: Don't forget computers are dangerous to our health. The monitors are harmful for eyesight. Moreover, working with computers for a long time can cause epilepsy.

Jack: Due to them modern medicine can diagnose diseases faster and more effectively. They control all data on hard disks. Imagine how much paper would have to be used, how many trees would have to be cut just to store information.

Bernard: But computers have different viruses. The biggest problem is when your hard disks break down and you lose your documents.

Jack: Ok, tell me, please, how you can watch movies, listen to the music, play games without computers?

Bernard: It's the main threat. Because of this, you can be computer addict. Moreover, teenagers have access to pornography and bloody games.

Jack: With the help of computers, we get access to the Internet. There are free calls from different countries which make the world smaller. Nowadays, it takes just a minute to buy a ticket and check in hotels of other countries. You can easily shop online everywhere. Also, they are wide-spread in education. Furthermore architects, designers and engineers can't do their work properly without computers. And they...

Bernard: Stop, please. I understood you. You are right that computer is an essential part of our life. I just want to prove you that they have disadvantages as well as advantages. It will be better to mention them too.

Jack: Do you want to say that I should write two essays?

Bernard: No, just write down pros and cons of computer in one essay while comparing them.

Jack: Good idea! Thank you very much!

Bernard: Not at all!

**VII. Answer the following questions to the dialogue. Role-play the dialogue with your partner on analogy.**

1. What do the friends think about the role of computers in our life? Whom do you agree with? 2. What is the main advantage of the computer? 3. Which computer capacity helps to save such natural resources as trees? Why? 4. The computers have got only positive characteristics, haven't they? 5. What can make you computer addict? 6. How can the Internet make the world smaller? 7. Whom are computer viruses dangerous for? 8. How can computers be hazardous to human health?

**VIII. Open the brackets and put the right form of the verb.**

1. Information is data that has been processed into a form that (has been / was / is) meaningful to the user. 2. Information systems and technologies (became / will become / have become) a vital component of businesses and organizations. 3. People (relied / rely / are relying) on information systems to communicate with each other using a variety of physical devices, information processing instructions and procedures. 4. In 2012, Zippo (has proposed / will propose / proposed) an ICT hierarchy where each hierarchy level contains some degree of commonality. 5. Humans (had stored / have been storing / will store) information since the Sumerians in Mesopotamia developed writing in about 3000 BC. 6. Summarization and message routing are the two methods that (have been increasing / will increase / increase) the sending and receiving efficiency of the system.

**IX. Speak about information systems and technologies, types of computers using key words, phrases and the topic sentences.**

**Unit II. COMPUTER ESSENTIALS**

*VOCABULARY STUDY*

**Word List**

*Nouns and noun phrases*

Central processing unit – центральный процессор; electronic circuit – электрическая цепь; firmware – встроенное ПО; RAM (Random Access Memory) – оперативное запоминающее устройство (ОЗУ); ROM (Read only memory) – постоянное запоминающее устройство (ПЗУ); circuitry – электрическая схема; floppy drive – накопитель на гибких магнитных дисках; hard drive /hard disk – жёсткий диск; fetch step – стадия выборки информации; decode step – стадия декодирования; execute step – стадия исполнения команд; writeback step – выдача результатов, выполненных процессором команд; USB port – порт универсальной последовательной шины; socket – электрическая розетка, разъем; chipset – набор микросхем; disk drive – дисковод; clock generator – генератор синхросигналов, тактовый генератор; PS / 2 connector – 6-штырьковый разъём.

*Adjectives* – non-volatile memory – энергонезависимая долговременная память; volatile memory – кратковременная память, temporary storage – ЗУ для временного хранения информации, two-dimensional motion – двумерное движение, peripheral bus – периферийная шина; performance speed / operation speed – скорость обработки информации; key matrix – клавиатурная матрица.

*Verbs*

perform – выполнять; underestimate – недооценивать, приуменьшать; imply – подразумевать; define – определять; bootstrap – выполнять загрузку.

**I. Match the words with the definitions below.**

*Screenshot, computer storage, monitor, software, punch card, firmware, magnetic drum, chipset, motherboard.*

1. A set of commands which are stored on a chip rather than as part of a program because the computer uses them very often.

2. A magnetic data storage device.
3. A piece of stiff paper that was used to contain digital information in old computers.
4. A visual display unit.
5. A set of programs.
6. The main printed circuit board found in general purpose microcomputers and other expandable systems.
7. A collection of integrated circuits which are designed to function together as a unit, especially to perform a particular task within a computer system.
8. A digital image of what should be visible on a monitor, television, or other visual output device.
9. A technology consisting of computer components and recording media that are used to keep digital data.

**II. Using a dictionary add as many words as possible into the table.**

<i>Verbs</i>	<i>Adjectives</i>	<i>Nouns</i>
1. to generate		
2.		performance
3. to install		
4.	magnetic	
5.		processing
6. to store		
7.		charge

**III. Choose the words with similar meaning from the two groups and arrange them in pairs.**

- A. processing, arithmetic/logic, computer, storage, instant, electronic, performance
- B. Speed, feedback, switch, capacity, storage, unit (×2).

**IV. Complete the sentences with the words below.**

*Software, operating systems, communicate, central processor unit, Digital Age, graphical user interface, online course components, networks.*

1. The idea of information age is usually linked to the concept of ..., Digital Revolution or Computer Revolution.
2. Professors are pushing for the ... to include more of the multimedia Web experience the Net Generation students are accustomed to.
3. Computers would need ... to make them do useful things.

4. Computing has made many evolutionary leaps over the decades - from the command line to the ... , from stand-alone PCs to a globally connected Internet.
5. PC can recognize speech and handwriting, create realistic animation, and enable people to collaborate, ... , and find information around the world, but we've barely scratched the surface of the PC's potential.
6. To date, tests have shown that 5G ... are starting to show high performance in various scenarios, such as densely populated urban areas and indoor access points.
7. Microsoft and Google are developing new unique ... that allow you to offer an interface for any screen sizes and devices of any power.
8. The basic components of a modern digital computer are: input device, output device, ... , mass storage device and memory.

**V. Match the synonyms given below.**

1. Accurate 2. Available 3. To communicate 4. Essential 5. To provide 6. Versatile
  7. To perform 8. To facilitate 9. Simultaneously 10. To search for.
- a. To ease b. Precise c. To look for d. To interact e. Accessible f. At the same time  
g. Fundamental h. To give i. To accomplish j. Multipurpose

**A. TEXT STUDY**

**I. Read the text and answer the following questions.**

1. What are the main parts of a computer?
2. What is a monitor used for?
3. What other output devices do you know?
4. What parts does a computer motherboard consist of?
5. Monitor is a visual display unit, isn't it?
6. RAM is a volatile form of computer memory, isn't it? How does it operate?
7. How do the buttons of a keyboard work?
8. Was Lenovo the first successful mouse-driven computer? What other modern computer brands do you know?
9. How does a mechanical mouse work?
10. How many stages can CPU operation be divided into? Describe all of them in detail.

**Text A. What are the Main Parts of a Computer?**

A computer is a complex machine that is capable of performing huge computations at an extraordinary speed. Its processing power is often compared to

that of human brain. Although human intellect is the undoubted winner in this competition, the capabilities of a computer cannot be underestimated. This complex machine influenced from the design of a human brain, mainly consists of a processing unit, an arithmetic/ logic unit, computer storage, and input/ output devices along with its peripherals. All the parts make the whole system.

**Central Processing Unit (CPU):** Also known as the computer processor, The CPU is an electronic circuit that executes computer programs. The primary responsibility of a computer processor is to execute a sequential set of instructions that constitute a program.

CPU operation can be divided into four basic steps, namely, fetch, decode, execute, and writeback. During the fetch step, the processor retrieves program instructions from memory. In the decode step, the instruction is broken down into parts. The instruction set architecture of the CPU defines the way in which an instruction is decoded. In the execute step, CPU performs the operation implied by the program instruction. During the writeback step the CPU writes back the results of execution to the computer's memory.

**Motherboard:** A computer motherboard consists of sockets in which microprocessors are installed, memory slots, a chipset that acts as an interface between the CPU bus and the peripheral buses (a bus connects all the internal parts of a computer) , non-volatile memory chips housing the system's firmware and a clock generator, which helps in the synchronization of various system components. Some motherboards also include logic and connectors to support input devices like PS/2 connectors for a mouse and keyboard.

**Hard Disk:** A hard disk is described as a part of the computer – which stores data and provides computer users with quick access to large amounts of data. A hard disk is an electromagnetically charged surface or a set of disks that record data in concentric circles known as tracks. It is a non-volatile storage device that stores digitally encoded data. The hard disks of desktops are generally capable of storing 120 GB to 200 TB of data. Laptop hard disk drives are smaller and have lower data storage capacities.

**Computer Memory:** It refers to those components of a computer, which retain digital data. It forms the core of a computer and makes up the basic computer model in collaboration with the CPU. Magnetic drums and delay lines used as primary storage by computers of the early days, have metamorphosed into a miniature silicon chip, which can achieve efficient storage of large volumes of data. Random Access Memory, popularly known as RAM, is a small-sized light and volatile form of computer memory. It is capable of temporary storage of data. Registers located in a computer processor are the fastest forms of computer storage. The most frequently used information is duplicated in the processor cache of a computer, thereby improving its performance. Computers require a non-volatile primary storage to read large programs. This non-volatile memory is known as ROM or Read-only memory. It also contains the startup programs used for bootstrapping a computer. Secondary storage media such as flash memory, magnetic tape, punch cards – are also a part of computer memory.

**Monitor:** A visual display unit, as it is called, is an electrical equipment that displays images generated by the video output device of a computer. Modern computer monitors use LCD or even plasma screens. The display provides computer users with instant feedback in the form of text and graphic images. Monitors are the most-used output devices of a computer.

**Keyboard:** A keyboard is regarded as an input device for a computer. With respect to the arrangement of keys, a computer keyboard is similar to a typewriter. The keys or buttons act as electronic switches with characters printed on them, with each keypress corresponding to a written symbol. A keyboard has its own processor and circuitry, which consists of a key matrix, which helps bring about the keyboard operation.

**Mouse:** A computer mouse is a pointing device that detects two-dimensional motion. Apple's Macintosh was the first successful mouse-driven computer. A mouse translates the motion of your hand into signals that a computer can recognize and respond to. There are three basic types of mice, namely, mechanical, opto-mechanical, and optical. Mechanical mice have a rubber or metal ball that can roll in all directions. Mechanical sensors in the mouse detect the direction of motion of the ball. Opto-mechanical mice differ from mechanical mice, in that they use optical sensors to detect motion. Optical mice, popularly used today, have a laser to detect movement of the mouse. They do not have mechanical moving parts and possess higher performance speeds.

## **II. Choose the best option to the following statements.**

1 A computer is a complex machine that ...

- a) is the most valuable part of our life;
- b) is capable of performing huge computations at an extraordinary speed;
- c) is capable of performing huge calculations at an extraordinary speed.

2 Although human intellect is the undoubted winner in this competition, the capabilities of a computer cannot be ...

- a) underestimated;
- b) underemployed;
- c) underemphasized.

3 All the computer parts make ...

- a) the whole processing unit;
- b) the whole technological process;
- c) the whole system.

4 CPU is an electronic circuit that ...

- a) executes computer programs;
- b) exists computer programs;
- c) excavates computer programs.

5 A computer motherboard consists of sockets, memory slots, non-volatile memory and ...

- a) a clock generator;
- b) a hard disk;

c) an analog system.

6 A hard disk is an electromagnetically charged surface or a set of disks that ...

a) record information in disks known as tracks;

b) record data in motherboard known as tracks;

c) record data in concentric circles known as tracks.

7 Computer Memory refers to those components of a computer, which retain digital data ...

a) and form the core of a computer;

b) and form the core of a storage device;

c) and form the core of a motherboard.

8 A hard disk is an electromagnetically charged surface or a set of ...

a) disks;

b) concentric circles;

c) desktops.

9 RAM is a small-sized light and ...

a) non-volatile form of computer memory;

b) volatile form of software;

c) volatile form of computer memory.

10 ... is a pointing device that detects two-dimensional motion.

a) A monitor;

b) A view port;

c) A computer mouse.

### **III. Comprehension Check. State whether the statements are true or false.**

**Correct if necessary.**

1 A keyboard is regarded as an output device.

2 There are four basic types of mice.

3 Monitors are seldom used as output devices of a computer.

4 Magnetic drums are used for processing information.

5 A hard disk is an electromagnetically charged surface or set of discs that record data in concentric circles known as tracks.

6 Some motherboards have logic and connectors to support input devices like PS/2 connectors.

7 Mechanical mice, popularly used today, have a laser to detect movement of the mouse.

8 CPU operation can be divided into three basic steps.

9 The processing power of a computer is equal to that of a human brain.

10 Hard disk is a non-volatile storage device that stores digitally encoded information.

### **IV. Translate the following words and word combinations into your native language. Try to memorize them.**



1. a set of commands; 2. a visual display unit; 3. circuit board; 4. circuitry; 5. concentric circles; 6. digital information; 7. digitally encoded data; 8. video output; 9. plasma screen; 10. firmware; 11. instant feedback; 12. integrated circuit; 13. key matrix; 14. optical sensor; 15. performance speed; 16. primary storage; 17. processing power; 18. processing unit; 19. punched card; 20. secondary storage media; 21. storing device; 22. two-dimensional motion.

### **V. Continue the phrases.**

- 1 Monitors are mostly used ...
- 2 A complex machine known as a computer mainly consists of ...
- 3 CPU operation can be divided into four basic steps, namely, ...
- 4 Random Access Memory is a small-sized light ...
- 5 Under an electrical equipment displaying images generated by the video output of a computer, it's easy to recognize ...
- 6 A non-volatile primary storage required by computers to read large programs is known as ...
- 7 A computer keyboard is similar to ...
- 8 A pointing device that detects two-dimensional motion has three basic types such as ...
- 9 Mechanical sensors in the mechanical mouse detect ...
- 10 As far as opto-mechanical mice use optical sensors to detect motion, they differ from ...

### **VI. Insert the missing words.**

- 1 The display provides computer users with ... in the form of text and graphic images.
- 2 During ... the processor retrieves program instructions from memory.
- 3 A keyboard is regarded as ... for a computer.
- 4 The keyboard buttons act as ... with characters printed on them.
- 5 A hard disk ... in concentric circles known as tracks.
- 6 Due to its ... a computer is often compared to the human brain's power.
- 7 A mouse ... the motion of your hand into ... that a computer can recognize and respond to.
- 8 ... is a small-sized light and volatile form of computer memory.
- 9 A clock generator helps in the ... of various system components.
- 10 ... is an electronic circuit that executes computer programs.
- 11 ... house the system's firmware.
- 12 A hard disk is described as a part of the computer disk drive, which ... data and provides computer users with ... to large amounts of data.
- 13 ... contains the startup programs used for bootstrapping a computer.
- 14 Computers require ... to read large programs.
- 15 ... possess high performance speeds, but they do not have mechanical moving parts.

## ***B. TEXT STUDY***

### **I. Read the text and fill in the gaps with the words from the list.**

a) activities; b) computer; c) data; d) devices; e) function; f) hardware; g) information; h) instructions; i) machine; j) memory; k) output; l) peripherals; m) program; n) sections; o) software; p) system; q) the central processing unit.

#### **Text B. What is a computer?**

A computer is an electronic 1) ... which can accept data in a certain form, process the data, and give the results of the processing in a specified format as 2) ... . First, data is fed into the computer's 3) ... . Then, when the program is run, the computer performs a set of 4) ... and processes the data. Finally, we can see the 5) ... on the screen or in printed form. A computer 6) ... consists of two parts: hardware and software. 7) ... is any electronic or mechanical part you can see or touch. 8) ... is a set of instructions, called a 9) ... , which tells the computer what to do. There are three basic hardware 10) ... : the central processing unit (CPU), main memory and peripherals. Perhaps the most influential component is 11) ... . Its 12) ... is to execute program instructions and coordinate the 13) ... of all the other units. In a way, it is the "brain" of the 14) ... . The main memory holds the instructions and 15) ... which are being processed by the CPU. 16) ... are the physical units attached to the computer. They include input / output and storage 17) ... .

### **II. Choose the right preposition.**

1. To be capable ... performing huge computations ... an extraordinary speed; 2. to be compared ... a human brain; 3. the winner ... the competition; 4. the capabilities ... a computer; 5. to be influenced ... the design ... a human brain; 6. a computer motherboard consists ... sockets; 7. to take a look... the major parts of a computer; 8. the responsibility ... a computer processor; 9. the set ... instructions; 10. to be divided ... four basic steps; 11. to be implied ... the program instruction; 12. to write back the results ... the computer's memory; 13. a connector ... a mouse and keyboard; 14. to record data ... concentric circles; 15. the motion ... your hand; 16. basic types ... mice; 17. to roll ... all directions; 18. to differ ... the mechanical mice; 19. to use sensors ... detect motion.

### **III. Fill in the necessary articles.**

I think each and every one of us must know about ... evolution of ... computers. It is one of ... most useful machines ever created by ... humans. ...invention of ... computer was just ... beginning of ... ever-increasing thirst for knowledge. I guess, even ... inventor of ... computer mustn't have realized ... potential that ... machine

would have. Today, almost ... all of our work is done by ... computing machine. Computers are enhancing technological growth at ... rapid rate.

**IV. Conversational Practice. Read the dialogue. Role-play the dialogue with your partner on analogy. Use set expressions and phrases given below:**

*frankly speaking, as far as I know, for sure, right you are*

Computers in our life

Jim: What's the most important part of the computer?

Paul: The most important part of your computer isn't the hard disk or the monitor or the printer. The most important part is the data you use.

Paul: It's the only part of your computer that can't be replaced. If you didn't made a back-up copy of it – and something bad happens to your computer – you will never see your data again.

Jim: I should buy a back-up device.

Paul: That's a very good idea.

**V. Open the brackets and put the right form of the verb.**

1. Similar in operation to desktop computers, laptop computers (are being miniaturized / are miniaturized / had been miniaturized) for mobile use. 2. Information system (implements / is being implemented / is implemented) within an organization for the purpose of improving the effectiveness and efficiency of the organization. 3. When the users' hands and sensory organs (engage / are engaged / have been engaged) in other activities, wearable computers are of great help in tracking human actions. 4. During the writeback step the CPU (is written back / writes back / has been written back) the results of execution to the computer's memory. 5. Computer users (are providing / will be provided / are provided) with quick access to large amounts of data by a computer hard disk. 6. A keyboard (has regarded / is regarded / regards) as an input device for a computer.

**VI. Translate from Russian into English.**

1. Портативные компьютеры обладают расширенной функциональностью, они компактны и эргономичны. 2. Зарядное устройство отвечает за подзарядку компьютера? 3. Какие периферийные устройства составляют аппаратное обеспечение компьютера? 4. Какими устройствами ввода, вывода и хранения информации ты пользуешься? 5. Устройства ввода информации переносят информацию на компьютер. К ним относят клавиатуру, мышку, сканнер, микрофон и веб камеру, не так ли? 6. Устройства вывода выводят обработанную информацию. Они включают такие периферийные устройства как монитор, принтер, колонки, не так ли? 7. Какие устройства хранения информации ты знаешь? 8. Восьмиядерные процессоры

современных компьютеров, мощная аккумуляторная батарея, семнадцатидюймовый экран с высоким разрешением полностью соответствуют ожиданиям самых требовательных пользователей. 9. Меню быстрого доступа команд открывается нажатием правой или левой клавиши на сенсорной панели мышки? 10. Какие производители являются лидерами на рынке мобильных электронных устройств сегодня?

**VII. Speak about the main parts of a computer using key words, phrases and the topic sentences. Describe your ideal computer.**

### **Unit III. GENERATIONS OF COMPUTERS. ARTIFICIAL INTELLIGENCE**

#### **VOCABULARY STUDY**

##### **Word List**

###### ***Nouns and noun phrases***

vacuum tubes — вакуумные трубки; malfunction — несрабатывание, технический сбой; predecessor — предшественник, прототип машины; silicon — кремний; hallmark — критерий, характерная особенность; semiconductor — полупроводник; networks — сети; voice recognition — распознавание голоса; artificial intelligence — искусственный интеллект; quantum computation — квантовые вычисления;

###### ***Adjectives and collocations***

punched cards — перфорированные карты; superior — старший, превосходящий; integrated circuits — интегрированные электросхемы; accessible — доступный; rectangular — прямоугольный;

###### ***Verbs, Adverbs***

run — вести, руководить; affect — воздействовать, влиять; result in — приводить к результату; take up — начинать; usher — объявлять, возвещать; attain — достигать; handle — управлять, обращаться; drastically — решительно; eventually — окончательно.

##### **I. Match the words with the definitions below.**

*Predecessor, computation, portable, spreadsheet, miniaturization, power, recognition, hallmark.*

1. The process of making something very small using modern technology.
2. Electricity, especially when considering its use or production.
3. A typical characteristic or feature of a person or thing.
4. A piece of computer software used for showing rows and columns of numbers or other data, and for doing calculations with this data.
5. A machine, system, law, etc. that has been replaced by a new one.

6. The act or process of calculating an answer or amount by using a machine.
7. Light and small enough to be easily carried or moved.
8. The fact of knowing someone or something because you have seen or heard him or her or experienced it before.

## II. Using a dictionary add as many words as possible into the table.

<b>Verbs</b>	<b>Adjectives</b>	<b>Nouns</b>
1. to power		
2.		generation
3. to operate		
4.	reliable	
5.		industry
6. to miniaturize		
7.		processing

## III. Choose the words with similar meaning from the two groups and arrange them in pairs.

- A. lowest-level programming, input, widespread, atomic, integrated, punched, voice, artificial, portable, object-oriented.
- B. Circuit, intelligence, card, language ( $\times 2$ ), energy, recognition, device, use.

## IV. Complete the sentences with the words below.

*Amplification, cards, circuitry, predictions, programming, input, current, light bulbs.*

1. The first generation computers used vacuum tubes for ... and switching purposes.
2. The tubes were made of sealed glass containers, the size of ....
3. The sealed glass allowed ... to flow wirelessly from the filaments to metal plates.
4. Vacuum tubes also started and ended ... by switching on and off when turned on or off.
5. Initially, technicians manually perforated ... with holes.
6. These machines were intended for low-level operations and thus ... was done using only binary digits 0s and 1s; the systems could solve only one problem at a time.
7. Among many things, the ENIAC was used to study the feasibility of thermonuclear weaponry, firing of ballistic artillery and engine thermal ignition, and elsewhere, for weather ....

8. Second generation computers saw advancement in data ... and output procedures.

## **V. Make up your own sentences using the following words and word combinations.**

Major technological development, enormous size, assembly languages, integrated circuit, silicon chips, palm of the hand, object-oriented languages, voice recognition, superconductors, artificial intelligence, quantum computation, molecular and nanotechnology, biological computing.

## **VI. Translate into English.**

1. Современные компьютеры универсальны, компактны и точны. 2. Компьютеры обрабатывают информацию с очень высокой скоростью. Они делают миллионы точных арифметических расчетов и геометрических измерений в секунду. 3. Если объем оперативной памяти компьютера невысок, пользователь ПК вынужден сохранять данные на флеш-накопитель. 4. Многозадачность – это способность компьютеров выполнять несколько операций одновременно. 5. Компьютеры позволяют пользователям выйти в Интернет и перемещаться по веб страницам с высокой скоростью. 6. Необходимая информация и обновления доступны для скачивания через любой Интернет-браузер. 7. Интернет приложение позволяет пользователям общаться друг с другом по Скайпу, участвовать в онлайн конференциях и взаимодействовать на форумах. 8. Необходимо устанавливать на компьютер хорошую антивирусную программу, чтобы обезопасить личные данные от атак хакеров. 9. Основные приложения Майкрософт Офис позволяют вам набирать текст, выделять его, копировать, вырезать, удалять, редактировать и сохранять. 10. Современные компьютерные технологии оказывают противоречивое влияние на систему образования. С одной стороны, они облегчают репрезентацию информации, так как студенты имеют свободный доступ к учебным материалам и могут делать контрольные работы в онлайн режиме. С другой стороны, компьютеры негативно влияют на учебную деятельность студентов, поскольку они используют их в основном не для получения основных знаний, а для развлечения. 11. Сейчас программные средства позволяют пользователям ПК улучшать качество фотографий, создавать высококачественную графику и редактировать веб сайты. 12. Сегодня люди очень зависимы от мобильных устройств.

### **A. TEXT STUDY**

#### **I. Read the text and answer the following questions.**

1. What did first generation computers rely on? Give the examples of the first-generation computing devices.
2. When was the transistor invented?
3. What are its advantages over the vacuum tubes?

4. What was the hallmark of the third generation of computers?
5. Describe the fourth generation of computers.
6. When was the Macintosh introduced?
7. What are fifth generation computers based on?
8. What are sixth generation of computers different from other generation computers?
9. What may future generation Computers be?

### **Generations of Computers**

The history of computer development is often referred as to the different generations of computing devices. Each of the six generations of computers is characterized by a major technological development that fundamentally changed the way computers operate, resulting in smaller, cheaper, more powerful and more efficient and reliable computing devices. As a result of the miniaturization, speed, power and memory of computers have proportionally increased. New discoveries are constantly being developed that affect the way we live, work and play.

*First generation (1940-1956): vacuum tubes.* The first computers used vacuum tubes and were often enormous, taking up entire rooms. 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. First generation computers relied on machine language, the lowest-level programming language understood by computers, to perform operations, and they could only solve one problem at a time. Input was based on punched cards and paper tape, and output was displayed on printouts. The UNIVAC and ENIAC computers are the examples of the first-generation computing devices.

*Second generation (1956-1963): transistors.* Transistors replaced vacuum tubes and ushered in the second generation of computers. The transistor was invented in 1947 but did not see a widespread use in computers until the late 1950s. 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. Second-generation computers moved to symbolic, or assembly languages, which allowed programmers to specify instructions in words. High-level programming languages were also being developed at this time, such as the early versions of COBOL and FORTRAN. The first computers of this generation were developed for the atomic energy industry.

*Third generation (1964-1971): integrated circuits.* The development of the integrated circuit was the hallmark of the third generation of computers. Transistors were miniaturized and placed on silicon chips, called semiconductors, which drastically increased the speed and efficiency of computers. Instead of punched cards and printouts, users interacted with 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 than their predecessors.

*Fourth generation (1971-1982): microprocessors.* The microprocessor brought the fourth generation of computers, as thousands of integrated circuits were built onto a single silicon chip. What in the first generation filled an entire room could now fit in the palm of the hand. The Intel 4004 chip, developed in 1971, located all the components of the computer – from the central processing unit and memory to input/output controls – on a single chip. In 1981 IBM introduced its first computer for the home user, and in 1984 Apple introduced the Macintosh. This generation of computers allows users to use the computer for word processing, spreadsheets, file managing and graphics. The computer languages like C, C++, and DBase are used in this generation to perform the accurate operations. The concept of networking and CD-ROM came into existence in the fourth generation. As these small computers became more powerful, they could be linked together to form networks, which eventually led to the development of the Internet. Fourth generation computers also saw the development of the GUI and the mouse.

*Fifth generation (1982-present): artificial intelligence.* Fifth generation computing devices, based on artificial intelligence, are still in development, though there are some applications, such as voice recognition, that are being used today. The use of parallel processing and superconductors is helping to make artificial intelligence a reality. Quantum computation and molecular and nanotechnology will radically change the face of computers in years to come.

Now we use the *Fifth Generation of Computers* which were started around 1982. These generation computers use the high level of languages like Perl, Python, C, JAVA, etc. Moreover, the Ultra Large Scale Integration technology was introduced in 5th generation computers which leads to the development of a microprocessor chip with several millions of chips on it.

It introduces the laptops, notebooks, PC's, desktops, and many more during this period. Besides, these computers are based on Artificial Intelligence. The fifth-generation computers perform the parallel processing with fast results. In this generation of the computers, the new languages are introduced like object-oriented languages like C++, JAVA, etc. The new operating systems are developed MS Window, Linux; Linux based components are developed. Example of fifth generation computers are Notebook, Laptop, Desktop, Ultra book, Chrome book, and many more.

**Advantages of Fifth Generation of Computers.** The fifth generation of the computer is much faster than fourth generation of computers. Whereas, these computers smaller and give fast results as compared with other generation computers. Moreover, these computers are portable so that, you can carry the devices anywhere and access at any time. Easy to handle these portable devices. With this generation computers, you can perform the multiple operations at a time with no slow down. The new version technologies are improved to repair the problems of computers. The fifth-generation computers introduce an improvement in semiconductor technology and Artificial Intelligence.

*Sixth Generation* of computers is different from, other generation computers in terms of size, speed and tasks that they perform. These computers are called



intelligent computers based on artificial intelligence or artificial brains. Whereas, it uses the semiconductors as the raw material to its processors. Moreover, the sixth generation introduces the voice recognition which takes dictation and recognizes the words. By using the voice recognition, you can search and send the messages quickly and easily. Although people need to speak slowly and clearly to work properly. With the 6th generation computers, the complex problem solving is possible and researches are ongoing to find the ways to solve the problems more efficiently and easily.

In the military, the AI helps soldiers to solve unexpected problems arise in many situations around the world. Additionally, it helps to prevent the many of world's spy network problems. In the automobile technology, robots are used for manufacturing.

*Future Generation Computers* may be neurons and attains the human level intelligence. We all have the image that the computer is a rectangular box either on desk or packet. We can think that computers are in cars or refrigerators. Whereas, you can operate the refrigerator with your phone or communicate with a light bulb. In fact, in the coming years, your light bulb will become the computer which performs operations and projects the information instead of light. Similarly, biological computing performs the operations using DNA or RNA and understand the biotechnology as one computer.

## **II. Describe the features of the six generations of computers.**

The five generations of computers are characterized by electrical current flowing through the processing mechanisms listed below:

- The first within vacuum tubes
- The second within transistors
- The third within integrated circuits
- The fourth within microprocessor chips
- The fifth unveiled smart devices capable of artificial intelligence.
- The sixth introduces the voice recognition which takes dictation and recognizes the words.

## **III. Choose the best option to the following statements.**

1. Each of the six generations of computers is characterized by ...
  - a) a size of a device.
  - b) a specific feature that influences the computer performance.
  - c) a major technological development that fundamentally changed the way computers operate.
2. The first computers used ...
  - a) vacuum tubes and were often enormous, taking up entire rooms.
  - b) a great deal of electricity, generated a lot of heat, which was often the cause of malfunctions.

- c) all of the above.
- 3. The transistor was invented ...
  - a) in 1947.
  - b) the late 1950s.
  - c) the early 1960s.
- 4. Transistors were miniaturized and placed on ...
  - a) conductors.
  - b) silicon chips.
  - c) semiconductors.
- 5. The fifth-generation computers perform ...
  - a) the parallel processing which fast results.
  - b) simultaneous output and input.
  - c) all of the above.

**IV. Comprehension Check. State whether the statements are true or false. Correct if necessary.**

- 1. Future generation computers may be neurons and attains the human level intelligence.
- 2. There are computers in cars, refrigerators different devices.
- 3. The AI help people to solve unexpected problems arise in many situations around the world.
- 4. The fourth-generation computers introduce an improvement in semiconductor technology and Artificial Intelligence.
- 5. Fourth generation computers also saw the development of the GUI and the camera.
- 6. The fifth-generation computers perform the parallel processing with fast results.

**V. Open the brackets and put the right form of the verb.**

- 1. Supercomputers are optimized (to be executed/ to be executing/ to execute) a few number of programs.
- 2. A desktop computer is designed (to be using/ to have been used/ to be used) on a single location.
- 3. Thanks to computer technology, we have been able (have achieved/ to achieve/ to be achieving) storage and processing of huge amounts of data.
- 4. The portability and capacity of laptops (operating/ to operate/ to be operated) on battery power have proven to be of great help to mobile users.
- 5. Tablets are mobile computers that are very handy (to have been used/ to use/ to be using).

**VI. Fill in the necessary articles.**

Charles Babbage was ... English polymath. Considered by some to be ... ‘father of the computer’, Babbage is credited with the invention of ... first

mechanical computer that eventually led to ... complex electronic design, though all ... essential ideas of modern computers are to be found in ... Babbage's analytical engine. His varied work in other fields has led him to be described as 'pre-eminent' among ... many polymaths of ... century. Parts of ... Babbage's incomplete mechanisms are on ... display in ... Science Museum in ... London. In 1991 ... functioning difference engine was constructed from ... Babbage's original plans.

## *B. TEXT STUDY*

**I. You are going to read an article about AI. 5 sentences have been removed from the article. Choose from the sentences A–F the one which fits each gap (1–5). There is one extra sentence which you do not need to use.**

**A.** The rational agent approach tries to make the best possible choice in the current circumstances.

**B.** A popular example of a reactive AI machine is IBM's Deep Blue, which is a machine that beat Garry Kasparov, a Grandmaster in chess in 1997.

**C.** To distil the essence of the human mind, there are 3 approaches.

**D.** The terms were coined by John Searle in order to differentiate the performance levels in different kinds of AI machines.

**E.** By definition, they have narrow capabilities, like recommending a product for an e-commerce user or predicting the weather.

**F.** The human agent ideally should not be able to conclude that they are talking to an Artificial Intelligence.

## **How does AI work, Types and Future of it?**

Artificial Intelligence is the simulation of natural intelligence in machines that are programmed to learn and mimic the actions of humans. These machines are able to learn with experience and perform human-like tasks.

*Artificial Intelligence Definition.* AI is an intelligent entity created by humans. AI is capable of performing tasks intelligently without being explicitly instructed. AI is capable of thinking and acting rationally and humanely.

We can base the human-likeness of an AI entity with the Turing Test, Cognitive Modelling Approach, Law of Thought Approach, Rational Agent Approach.

The basis of **the Turing Test** is that the Artificial Intelligence entity should be able to hold a conversation with a human agent. (1) To achieve these ends, the AI needs to possess these qualities:

Natural Language Processing to communicate successfully.

Knowledge Representation to act as its memory.

Automated Reasoning to use the stored information to answer questions and draw new conclusions.

Machine Learning to detect patterns and adapt to new circumstances.

**Cognitive Modelling Approach** tries to build an Artificial Intelligence model-based on Human Cognition. (2)

Introspection: observing our thoughts, and building a model based on that

Psychological Experiments: conducting experiments on humans and observing their behavior.

Brain Imaging: Using MRI to observe how the brain functions in different scenarios and replicating that through code.

**The Laws of Thought** are a large list of logical statements that govern the operation of our mind. The same laws can be codified and applied to artificial intelligence algorithms. Also, there are some actions that we take without being 100% certain of an outcome that an algorithm might not be able to replicate if there are too many parameters.

**The Rational Agent Approach** acts to achieve the best possible outcome in its present circumstances. According to the Laws of Thought approach, an entity must behave according to the logical statements. But there are some instances, where there is no logical right thing to do, with multiple outcomes involving different outcomes and corresponding compromises. (3)

To understand how Artificial Intelligence actually works, one needs to deep dive into the various sub domains of Artificial Intelligence and understand how those domains could be applied into the various fields of the industry.

**Machine Learning** teaches a machine how to make inferences and decisions based on past experience. It identifies patterns, analyses past data to infer the meaning of these data points to reach a possible conclusion without having to involve human experience.

**Deep Learning** teaches a machine to process inputs through layers in order to classify, infer and predict the outcome.

**Neural Networks** work on the similar principles as of Human Neural cells. They are a series of algorithms that captures the relationship between various variables and processes the data as a human brain does.

**Natural Language Processing** is a science of reading, understanding, interpreting a language by a machine. Once a machine understands what the user intends to communicate, it responds accordingly.

**Computer Vision** algorithms try to understand an image by breaking down an image and studying different parts of the objects.

**Cognitive Computing** algorithms try to mimic a human brain by analyzing text/speech/images/objects in a manner that a human does and tries to give the desired output.

Artificial Intelligence can be built over a diverse set of components and will function as an amalgamation of Philosophy, Mathematics, Economics, Neuroscience, Psychology, Computer Engineering, Control Theory and Cybernetics, Linguistics.

There are 3 Types of Artificial Intelligence: Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI), Artificial Super Intelligence (ASI)

Artificial Narrow Intelligence (ANI) is the most common form of AI that you'd find in the market now. These Artificial Intelligence systems are designed to solve one single problem and would be able to execute a single task really well. (4) By definition, they have narrow capabilities, like recommending a product for an e-commerce user or predicting the weather. This is the only kind of Artificial Intelligence that exists today. They're able to come close to human functioning in very specific contexts, and even surpass them in many instances, but only excelling in very controlled environments with a limited set of parameters.

AGI is still a theoretical concept. It's defined as AI which has a human-level of cognitive function, across a wide variety of domains such as language processing, image processing, computational functioning and reasoning and so on. An AGI system would need to comprise of thousands of Artificial Narrow Intelligence systems working in tandem, communicating with each other to mimic human reasoning.

Artificial Super Intelligence (ASI) is seen as the logical progression from AGI. It would be able to surpass all human capabilities. This would include decision making, taking rational decisions, and even includes things like making better art and building emotional relationships.

Extensive research in Artificial Intelligence also divides it into two more categories, namely Strong Artificial Intelligence and Weak Artificial Intelligence. (5) Here are some of the core differences between them.

**Weak AI.** It is a narrow application with a limited scope. This application is good at specific tasks. It uses supervised and unsupervised learning to process data. Example: Siri, Alexa.

**Strong AI.** It is a wider application with a vaster scope. This application has an incredible human-level intelligence. It uses clustering and association to process data. Example: Advanced Robotics.

## **II. Translate the following words and word combinations into your native language. Try to memorize them.**

Cluster, supervised learning, to mimic, cognitive function, amalgamation, infer and predict the outcome, variable, inference, capture, vast, circumstance, instance, explicitly, entity, approach, introspection, MRI, detect, replicate.

## **III. Read the text and answer the following questions.**

1. What is the definition of Artificial Intelligence?
2. What approaches and tests can we base the human-likeness of an AI entity with?
3. What do you need to understand how Artificial Intelligence actually works?
4. What are subdomains of Artificial Intelligence?
5. Describe three types of Artificial Intelligence?
6. Characterize Weak AI and Strong AI, give examples.

**IV. Paraphrase the following sentences. Make use of the words from the list instead of the words given in italics.**

*Indispensable, drag, shortcut menu, performance, boot time, technical specifications, storage capacity, portable, application open time, meet the needs, enhanced, scroll.*

1. Laptops are *essential* part of nearly all people's life. So, you can hardly imagine a person who can do without them. 2. Mobile devices today are compact and *movable*. 3. *Upgraded* software and functionality are strong points of modern computers. 4. It is rather difficult to find high quality mobile devices with long-run *productiveness*. 5. One of the most important *technical parameters* of a mobile device is a long-life battery. 6. A computer's long *load time* and *attachment open time* tell a user about some hardware and software problems. 7. *Space for saving files* is usually insufficient for most computer users. 8. The latest computers completely *correspond* to users' needs. 9. According to the manual, you need to press the left button of the touchpad and *move* the cursor *from top to the bottom* to look through the web page. 10. If you want to call for *contextual menu*, select an item and click the right touchpad button. 11. You can also copy a file by *pulling* it *over* to the new location point.

**V. Arrange the words in the proper order to make questions.**

1. installed / she / a new / has / or / the updates / application? 2. the function / is / what / of / the / CPU? 3. are / who / you / e-mail / sending / this / to? 4. sent / who / this / me / reference? 5. have / a 3.0USB port / does / or / PC / your / a 2.0USB port? 6. add / a water-proof / manufacturers / do / to / the assembly / membrane / parts / a laptop / of? 7. what / work / platform / on / this / computer / does? 8. boot / has / time / doesn't it / your / laptop / a quick? 9. manual / is / what / about / this? 10. enhanced / created / who / software / this?

**VI. Ask questions to get these answers.**

1. \_\_\_\_\_?  
The touchpad is placed on the keyboard.

2. \_\_\_\_\_?  
Yes, the keyboard does.

3. \_\_\_\_\_?  
The right button does.

4. \_\_\_\_\_?

Capacitive battery is used to meet all the above mentioned specifications and users' preferences.

5. \_\_\_\_\_?

Terry clicked the right button of the mouse.

6. \_\_\_\_\_, \_\_\_\_\_?

Yes, the shortcut menu does.

7. \_\_\_\_\_, \_\_\_\_\_?

Yes, the input devices will.

8. \_\_\_\_\_?

No, am not. I am closing the application.

9. \_\_\_\_\_?

I'm reloading the computer.

## **VII. Give the main points of the text in 4-7 sentences. Use the following clichés:**

*The information presented in the text... .On the one hand ..., on the other hand ...There was some new information for me... . I find this text ... . I like (dislike) the text ... .*

## **Unit IV. COMPUTER NETWORKS**

### **VOCABULARY STUDY**

#### **Word List**

##### ***Nouns and noun phrases***

A hub — концентратор; switch — коммутатор; cabling — кабельное соединение; token — аппаратный ключ, генератор одноразовых паролей в системах аутентификации; terminator — оконечное устройство; Media Access Control address — уникальный идентификатор для контроля доступа к носителю информации; stream — поток ; encryption — шифровка, кодирование; lock-down cables — блокирующие кабели; swipe-card — бесконтактная карта доступа; CCTV (Close Circuit Television) — система скрытого видеонаблюдения;

##### ***Adjectives and collocations***

Stand-alone — изолированный, независимый; copper wiring — медный кабель; a junction box — кабельная коробка; data packet collisions — конфликт пакетов данных. Попытка двух (или более) станций одновременно начать передачу пакета в сети; hexadecimal number — шестнадцатеричное число; packet switching technology — технология пакетной коммутации, т.е. технология маршрутизации и передачи данных, по которому всё сообщение разбивается на небольшие фрагменты, пакеты, каждый из которых последовательно один за другим пересылается по коммуникационным каналам самостоятельно, возможно, по разным путям. В пункте назначения происходит сборка пакетов; upper-case/lower-case letters — буквы

верхнего/нижнего регистра; peer-to-peer network – сеть с равноправными узлами;

### ***Verbs, Adverbs***

Back and forth — вперед - назад; allocate — распределять, предназначать; transmit — передавать; expand — расширять; troubleshoot — выявлять и устранять неисправности; temporarily — временно; keep track — отслеживать; authenticate — аутентифицировать, проверять на подлинность; log onto — входить в систему.

### **I. Match the words with the definitions below.**

*Router, network, back up, deliver, storage device, queue, via, network interface card (NIC).*

1. The way computers and peripherals are physically connected together.
2. It is needed to connect computers and other peripherals to a network.
3. A piece of electronic equipment that connects computer networks to each other, and sends information between networks.
4. A piece of computer equipment in which information and instructions can be kept.
5. By way of, or by use of.
6. To make a copy of information in a computer that is stored separately.
7. A line of people or things waiting for something.
8. To provide a service, to take goods, etc. to a place.

### **II. Using a dictionary add as many words as possible into the table.**

<b><i>Verbs</i></b>	<b><i>Adjectives</i></b>	<b><i>Nouns</i></b>
1. to access		
2.		packet
3. to link		
4.	secure	
5.		collision
6. to identify		
7.		cabling

### **III. Choose the words with similar meaning from the two groups and arrange them in pairs.**

- A. cable, fiber-optic, storage, wireless, data, data packet, backed up  
 B. packets, collisions, files, connections, network (×2), facility.



**IV. Complete the sentences with the words below. You may have to change some words slightly.**

*Peer-to-peer, fiber-optic, hub, LAN, backbone, hotspot, server, capability, router, setting up*

1. All the PCs on a \_\_\_\_ are connected to one \_\_\_\_, which is a powerful PC with a large hard disk that can be shared by everyone.
2. A \_\_\_\_ is a more complex device that usually includes the \_\_\_\_ of hubs.
3. In the \_\_\_\_ model each client can download and share files with other users.
4. To access the Internet via a \_\_\_\_, you'll need an Internet device that has Wi-Fi capability.
5. A \_\_\_\_ is an intermediary device which enables communication between all devices on a network.
6. \_\_\_\_ an e-mail account is easy, and it's free.
7. A \_\_\_\_ cable has been installed on a large scale, enabling vast amounts of data to be transmitted at a high speed using light signals.
8. A \_\_\_\_ is the largest 'pipe' (cable or channel) that carries the heaviest data traffic at highest possible speed, and which connects every main server or device on the network.

**V. Make up your own sentences using the following words and word combinations.**

A Computer Network system, to be linked through a hub or switch, shared hardware and software, network cabling, network topology, data packet collisions, client-server network, peer-to-peer network, common network topologies: ring, line (bus) and star.

**VI. Translate the following sentences into English.**

1. Самый простой и наименее дорогой способ соединить компьютеры в вашем доме – это установить беспроводную сеть, которая использует радиоволны вместо проводов. 2. Глобальные сети соединяют компьютеры линиями связи и программными протоколами, позволяя пользователям обмениваться данными быстро и надежно. 3. Если ты введешь правильный пароль, то у тебя будет доступ к сети. 4. В прошлом телефонные сообщения передавались по металлическим проводам, а сейчас передаются по оптоволоконным кабелям. 5. – Мой ноутбук подключается к Wi-Fi, но сила сигнала очень низкая. Что вы можете посоветовать? – Используйте свой компьютер максимум тридцать метров от маршрутизатора. 6. – Ваши специалисты уже подключили все компьютеры к локальной сети? – Нет еще. Техники устанавливали сеть целый день вчера, но наша сетевая структура требует большого количества устройств. 7. Компоновка большинства домашних сетей представляет собой систему, основанную на замкнутом цикле. 8. На прошлой неделе в нашем офисе была установлена сложная сеть,

включающая сервер, сетевой аппаратный узел, несколько принтеров и ряд компьютеров. 9. Благодаря Wi-Fi сегодня легко получить доступ к Интернету из кафе, отеля, аэропорта и других общественных мест.

#### *A. TEXT STUDY*

##### **I. Read the text and answer the following questions.**

1. What is a Computer Network?
2. What are the types of network connections?
3. What are the advantages of networking stand-alone computers into a LAN?
4. What hardware is needed to network stand-alone computers into a LAN?
5. What is a hub, a switch, a wireless access point?
6. What are the roles of the computers in client-server and peer-to-peer networks?
7. What are ring, bus and star network topologies?

#### **TEXT A. Computer Networks**

A Computer Network is a system of connected computers, peripherals and communication devices that can exchange data and share resources. If the network is limited to a single building or group of buildings then it is described as a Local Area Network (LAN). Computers in a LAN can be linked together directly but more commonly are linked through a hub or switch. The network connections can be cable, fiber-optic, or wireless (infra-red, microwave or radio). A router acts as an interface between networks, passing data packets back and forth between them.

Hardware such as printers can be shared by all the computers on the network. Some software and files such as databases can be shared by different users. Users can work together as networked computers can communicate with each other easily and quickly via email or internal messaging systems. An Internet connection can be shared. File storage facilities can be shared and files therefore accessed from any networked computer. Improved security as there is central control over user access, which programs, data and hardware users have access to. Files can easily be backed up centrally.

*A typical computer network interface card for a cabled network connection.* A network adapter such as a network interface card (NIC) is needed to connect computers and other peripherals to a network, either by cable or wirelessly. Each connected device is allocated an IP address to uniquely identify it on a TCP/IP network. Cabling is needed in a non-wireless network to connect the computers and peripherals together, either directly or through a hub/switch. Typically network cabling will be copper wiring or a mixture of this and fiber-optic cable. The amount of cabling needed depends on the network topology (the way computers and peripherals are physically connected together).

A hub is used to link computers and peripherals together in a cabled network that uses a star network topology. A hub is a junction box but it does not manage

any of the traffic that comes through it, any data packet entering any port is sent out to all the connected ports. This can result unnecessary data packet collisions which slow the network considerably as the amount of data traffic rises.

A switch is used in the same way as a hub but the switch uses the IP address of the data packet to direct the data to the correct device, rather than being sent out to all the connected ports. This greatly reduces data packet collisions resulting in a faster network than the equivalent one using a hub.

A wireless access point is a device that allows computers and printers etc. to connect to a wired network using radio waves rather than cabling, provided they are equipped with a wireless NIC. This allows a network to build with few or no cables and makes it simple to add further wireless devices.

*Client-server network.* On a client-server network there are two types of computers with two distinct roles. One or more server computers which have the role of: controlling access to shared files; installing software on the client computers; allowing the client computers to access networked printers and managing print queues; controlling client computer access to the Internet; controlling user access to the network by verifying usernames and passwords'; controlling the levels of access to files and software once users have once logged onto the network; storing, delivering and sending email.

Multiple client computers (workstations) are then connected to the server computers. These are where the user actually works. Some servers may have a more specialized role such as a print server, dedicated to controlling access to shared printers on the network and queuing print jobs in the order that they were sent by the users.

*Peer-to-peer networks.* In a peer-to-peer network computers are simply linked together, either using cables and a hub or with a wireless connection. All the computers in the network have equal status so there is no server controlling the network. Provided that sharing has been enabled, any computer on the network can access data from of any other computer and any computer on the network can use a printer connected to any other computer. A peer-to-peer network will be cheaper to set up and, provided there are only a small number of computers, will be easier to manage than server-based networks. However, they are less secure and peer-to-peer networks are used mainly by home users and small companies who do not have the necessary technical staff to maintain a client-server network.

A network topology is the name given to the way in which devices are physically connected in a network. There are three common network topologies: ring; line (bus) and star.

**Ring topology.** This is typically a peer-to-peer network. The devices are connected in a ring and data travels in one direction using a control signal called a 'token'. To send data, a computer must wait for the token to reach it, attach the data to the token, and then return both to the network. When the token reaches the intended destination, the receiving device removes the data from the token and returns it to the network so the process can start again.

*Advantages:* Not greatly affected by adding further devices or heavy network traffic as only the device with the ‘token’ can transmit data so there are no data collisions. Relatively cheap to install and expand.

*Disadvantages:* Slower than a star topology under normal load. If the cable fails anywhere in the ring or any device fails then the whole network will fail because the token cannot be passed around the ring. This is the hardest topology to troubleshoot because of the difficulty of tracking down where in the ring the failure has occurred. It is inconvenient to modify or expand because to add or remove a device means the network has to be shut down temporarily. The special network interface cards needed to connect devices are expensive.

**Bus (line) topology.** This is typically a peer-to-peer network. Devices are connected to a main (bus) cable using special T-connectors. If data is being sent between devices, then the other devices cannot transmit. The bus cable must have a terminator fitted at each end to prevent reflected signals.

*Advantages:* The simplest and cheapest to install and extend. Well suited for temporary networks with not many devices. Very flexible as devices can be attached or detached without disturbing the rest of the network. Failure of one device does not affect the rest of the bus network. Simpler than a ring topology to troubleshoot if there is a cable failure because sections can be isolated and tested independently.

*Disadvantages:* The bus cable has a limited length and if it fails then the whole network will fail. Performance of the network slows down rapidly with more devices or heavy network traffic as data cannot be transmitted while the bus is in use by other devices. Slower than a ring network.

**Star topology.** This is typically a client-server network. A central computer (server) is connected to the other devices either through a switch or hub.

*Advantages:* The most reliable because the failure of one device does not affect other devices. Simple to troubleshoot because only one device is affected by a cable break between the switch and the device. Adding further devices does not greatly affect performance because the data does not pass through unnecessary devices. Easy to add extra devices by plugging their cables into the hub/switch.

*Disadvantages:* Uses the most cable which makes it more expensive to install than the other two topologies. The extra hardware required such as hubs/switches further increases the cost. If the hub/switch fails then the whole network will fail. When used as a client-server network then the whole network will fail if the cable link between the server and the hub/switch fails.

## II. Compare the features of the network.

Topology	LINE (BUS)	RING	STAR
Performance with few devices or low network traffic	Medium	Slow	Fast

<b>Change in performance with many devices or high network traffic</b>	Most affected	Least affected	Some effect but the switch/hub can be upgraded easily
<b>Ease of troubleshooting</b> (compared to other topologies)	Fairly easy	Hard	Easy
<b>Cost of installation</b> (compared to other topologies)	Low	High	High
<b>Ease of setting up and modifying</b> (compared to other topologies)	Easy to set up and modify	Easy to set up but harder to modify	Easy to set up and modify
<b>Problems to the network caused by cable or device failure</b>	Failure of the bus cable causes total failure. Failure of a PC has no affect.	Cable or PC failure causes total network failure.	Failure of the cable to the client PC only affects that PC. Failure of the hub/switch or the server causes total network failure.

### III. Choose the best option to the following statements.

1. The network connections can be ...
  - a) fiber-optic.
  - b) wireless (infra-red, microwave or radio).
  - c) all of the above.
2. Data packet collisions can
  - a) shut down the network.
  - b) accelerate the network insignificantly as the amount of data traffic rises.
  - c) slow the network considerably as the amount of data traffic rises.
3. The switch uses the IP address of the data packet to...
  - a) direct the data to the correct device.
  - b) be sent out to all the connected ports.
  - c) reduce data packet collisions.
3. Any computer on the network can ...
  - a) provide sharing facilities.
  - b) access data from of any other computer.
  - c) use a printer connected to any other computer.
4. Bus network is ...
  - a) the simplest and cheapest to install and extend.
  - b) well suited for temporary networks with not many devices.

- c) very stable.
- 5. Star network ...
  - a) uses the most cable which makes it expensive to install.
  - b) requires no extra hardware.
  - c) fails if the hub/switch fails.

**IV. Complete the sentences using the Present Simple or Future Simple (Active or Passive Voice).**

1. If you (to add) memory to a computer, it (to run) faster.
2. Files and peripherals (to share) by all the workers when our company (to set up) a LAN.
3. If you (not to save) your document, you (to lose) the information.
4. The keyboards (not to use) in future if voice-recognition systems (to become) more sophisticated.
5. If David (not to have) enough computer knowledge, he (to need) to hire a qualified technician to install a LAN.
6. If your network (not to protect), unauthorized users (to break) into the system easily.
7. If the central server (to fail), the whole network (to fail).

**B. TEXT STUDY**

**I. Read the text and answer the following questions.**

1. What is a Wide Area Network (WAN)?
2. What do the terms IP addressing, MAC addressing, data packet and protocols mean?
3. What do data packets serve for?
4. Enlist the types of protocols and their function.
5. Enlist the network security techniques?
6. Which technique is the most reliable one? Give your reasoning.

A WAN covers a much larger geographical area than a LAN. The largest WAN is the Internet itself as it is a global network of linked computers and LANS. Smaller examples of a WAN would include a national ATM network used by a bank to allow customers to access cash. Many supermarkets and other large companies operate their own national WANs.

*IP Addressing.* An Internet Protocol (IP) address is a unique address number that is allocated to devices on a computer network that uses the Internet Protocol.

Each address has to be unique as it is used to identify a particular device on a network, allowing data to be sent to the correct device and returned to the device that requested it. An IP address can be private, (for use on a LAN) or public (for use on the Internet or another WAN).

*MAC Addressing.* In computer networking, a Media Access Control address (MAC address) is a unique 48-bit number assigned by the manufacturer to any

hardware device used to connect to a network. MAC addresses are limited to being used on a LAN. Because they are so long, MAC addresses are usually displayed as 8 hexadecimal numbers, for example 00-0C-E7-5D-A8-AD.

*Data Packets.* Modern computer networks, including the Internet, carry data by breaking it down into a series of distinct units called data packets, rather than sending it as a continuous stream of data. A typical data packet might contain 1,000 to 1,500 bytes.

In complex networks such as the Internet, a series of packets sent from one computer to another may follow different routes to reach the same destination and may arrive out of order. This technology is called packet switching and makes the network more efficient because the network can balance the load across various pieces of equipment and if there is a problem with one piece of equipment in the network then packets can be routed around it.

*Protocols.* A communications protocol is a description of the format that digital data has to be in and the rules for hardware/software to communicate that data. The protocol may also define how devices authenticate themselves and may define how error checking and correction takes place.

Examples include the Internet Protocol Suite, the set of communications protocols used for the Internet and similar networks. It is commonly also known as TCP/IP, named from two of the most important protocols in it:

The Internet Protocol (IP) – used to route data packets between networks and over the Internet.

The Transmission Control Protocol (TCP) – used to exchange data directly between two networked computers.

Some other common Internet Protocols:

HTTP (HyperText transfer Protocol): used on the World Wide Web for transferring web pages and files contained in web pages such as images;

FTP (File Transfer protocol): employed for transferring files from one computer to another.

SMTP (Simple Mail Transport Protocol): used for email;

UDP (User Datagram Protocol): a simpler transmission model than TCP, leaving checks for reliability, ordering, or data integrity to the applications exchanging the data. This increases the speed data is exchanged making it more suitable for real-time systems, streaming media, Voice over IP (VoIP) and many online games;

TLS/SSL (Transport Layer Security / Secure Sockets Layer): Encryption protocols used with secure communications over the Internet.

*Network security techniques.* A network needs security to prevent unauthorized access to the information stored on the network and unauthorized access to hardware managed by the network.

*User access levels:* most network security involves users having different levels of user access to the network. The network manager will have full access to all the hardware and software on the network but other users may be restricted to

certain areas of the network, only have READ access to files or be unable to install new software and hardware.

This user access is controlled by the user having to log onto the network with a unique username which is then associated with a particular set of permissions.

*Suitable passwords:* a password is used in combination with the username to prevent unauthorized access to a network. A suitable (strong) should ideally not be a dictionary word and should include a mixture of upper-case and lower-case letters, numbers and even symbols so it is unlikely to be guessed. Many network authentication systems will require users to regularly change their passwords and block the use of previous passwords. Stored passwords on the network should be encrypted.

*Access restrictions:* users can only log in during certain hours of the day and from certain computers. HTTP is a secure web connection.

*Encryption:* files can be encrypted making the data meaningless without the correct numerical key to decrypt it. This is particularly important with wireless networks and sensitive data such as online financial transactions.

*Physical security:* CCTV, door locks, laptop lock-down cables and swipe-card systems etc. can be used to physically restrict access to networked computers.

*Firewall:* this can be a device or be software-based. Its purpose is to control network transmissions between networks. It is commonly used to block unauthorized access hacking to a network from the Internet, while allowing legitimate network traffic through.

*Antivirus software:* Many viruses are designed to bypass security systems and having up-to-date antivirus software installed will reduce this risk.

*Proxy server:* this can be a device or be software-based and uses a set of rules to check that the file, connection or web page the user requests is acceptable. It can filter network traffic by IP address or protocol. If the request is valid then the proxy server makes the connection on behalf of the user.

*Wi-Fi access restrictions* should be in place to allow only legitimate computers to connect to the network. All data transmitted over Wi-Fi should be encrypted using the highest level available.

*Filtering:* certain websites can be blocked by filtering. However, this only increases security if the sites are known security risks, for example they distribute viruses.

## **II. Comprehension Check. State whether the statements are true or false. Correct if necessary.**

1. An IP address can be private (for use on the Internet or another WAN), or public (for use on a LAN).
2. MAC addresses are used on any computer network.
3. Modern computer networks carry data by breaking it down into a series of data packets.
4. A communications protocol is a description of the format that digital data has to be in and the rules for hardware/software to communicate that data.



5. TLS/SSL is employed for transferring files from one computer to another.
6. A password is used in combination with the encryption to prevent unauthorized access to a network.
7. Proxy server is used to physically restrict access to networked computers.
8. Filtering can block certain websites.

### **III. Insert the missing words.**

*Frequency, satellite, transmit, wireless, receiver.*

We can categorize ... (1) communication into 3 ways as mentioned below:

*Radio waves.* The signals which have transmitting frequency ranging from 3KHz to 1 GHz are called radio waves. These are omnidirectional as when an antenna ... (2) the signals, it will send it in all the directions. If one sends the radio wave signals, then any antenna having the receiving properties can receive it.

Its disadvantage is that, as the signals are transmitted through radio waves, it can be intercepted by anyone, hence it is not suitable for sending classified important data. It is used in AM, FM radio, television.

*Microwaves.* The signals which have transmitting ... (3) ranging from 1GHz to 300GHz are called microwaves.

These are unidirectional waves, which means that when the signal is transmitted between the sender and ... (4) antenna then both need to be aligned. Microwaves have fewer interference issues than the radio wave communication. It is very widely used in ... (5) and wireless LAN communication. There are two types of microwave communication. Terrestrial microwave. Satellite microwave. The only disadvantage of the microwave is that it is very costly.

*Infrared waves.* The signals which have transmitting frequency ranging from 300GHz to 400THz are called infrared waves. It can be used for short distance communication, like infrared remote control as infrared with high frequencies can't penetrate the rooms and thus prevents the interference between one device to another.

### **IV. Complete the sentences with the correct tense form of the verbs in brackets.**

#### **a. Active Voice**

1. They (to test) the program and (to detect) the bugs by 3 p.m. tomorrow.
2. This company (to play) an important role in multimedia development since its very inception.
3. She never (to be able) to fix the problem.
4. They (not to install) the updates yet.
5. You ever (to watch) TV on the Internet?
6. He (to study) some high-level computer languages by next year.

#### **b. Passive Voice**

1. After the program (to be improved) it (to be published) as an updated version.
2. All the articles on programming languages (to be translated) by next Friday.
3. Five networks for large companies (to be set up) recently.
4. The program

already (to be translated) into machine language. 5. A flowchart (to be designed) by 3 pm yesterday. 6. The printer fault (not to be fixed) yet.

**V. Give the main points of the texts A and B. Use the following clichés:**

*The text is about ... .In the next paragraph ... . The text elucidates ... . It should be noted, that ... . The text gives a good insight into ... . To conclude ... .*

**VI. Speak about computer networks.**

**Unit V. INTERNET**

**VOCABULARY STUDY**

**Word List**

***Nouns and noun phrases***

Decade — десятилетие; attention span — устойчивость внимания; survey — исследование, опрос; accolade — похвала; incentive — мотив, стимул; mailing list — список рассылки электронных почтовых сообщений; assignment — задание; syllabus (pl. syllabi) — программный, учебный план;

***Adjectives and collocations***

Broadband — широкополосная сеть; instant messaging — система мгновенного обмена сообщениями; collaborative — совместный, способный к сотрудничеству; fancy — особенный; ubiquitous — повсеместный, распространённый;

***Verbs and adverbs***

Withstand — противостоять; transfer — переносить; instantly — мгновенно; simultaneously — одновременно; consume — потреблять; lack — испытывать нехватку; crave — настойчиво стремиться, желать; scramble — смешивать.

**I. Match the words with the definitions below.**

*Query, domain name, sophisticated, colon, slash, bookmark, compatibility, feedback.*

1. The part of an email or website address on the internet that shows the name of the organization that the address belongs to.
2. Reaction to a process or activity, or the information obtained from such a reaction.
3. A question, often expressing doubt about something or looking for an answer from someone.
4. It is a way of thinking, a system, or a machine, which is complicated or made with great skill.
5. The fact of being able to be used with a particular type of computer, machine, device, etc.

6. The symbol: used in writing, especially to introduce a list of things or a sentence or phrase taken from somewhere else.

7. The address of a web page that is kept on your computer so that you can find it again easily.

8. The symbol / used in writing to separate letters, numbers, or words.

## II. Using a dictionary add as many words as possible into the table.

<i>Verbs</i>	<i>Adjectives</i>	<i>Nouns</i>
1. to separate		
2.		symbol
3. to communicate		
4.	attached	
5.		transmission
6. to link		
7.		maintenance

## III. Choose the words with similar meaning from the two groups and arrange them in pairs.

A. Electronic, research, click, share, Instant, homework, crave, search;

B. assignments, engine, hyperlink, messaging, rewards, files, mail, skills.

## IV. Complete the sentences with the words below. You may have to change some words slightly.

*Digital data, IP address, router, access, wi-fi, link, attached file, voice call.*

1. By clicking on a \_\_\_\_, you might be taken to another website.

2. Traditionally, telecoms companies make most of their profits from \_\_\_\_.

3. It's possible to store a lot more \_\_\_\_ on a DVD.

4. The \_\_\_\_ will connect your computer to the Internet via your phone line.

5. With the e-mail we received some \_\_\_\_.

6. Most public libraries provide free \_\_\_\_ to the Internet for library members.

7. With \_\_\_\_, you can watch live news and sport, download and share large files quickly.

8. In order to be able to connect to the Internet a computer needs an \_\_\_\_.

## V. Translate the following sentences into English.

1. Интернет предоставляет доступ к невероятному количеству информации. 2. – Какой интернет-браузер ты используешь? – Я предпочитаю Гугл Хром, так как он, с моей точки зрения, самый надежный. 3. В Интернете компьютеры соединены друг с другом сетью оптоволоконных кабелей или спутников. 4. Для чего используется маршрутизатор? – Он позволяет вам создать беспроводную сеть. 5. Когда вы ищите что-нибудь в Интернете, вы путешествуете в киберпространстве. 6. Хороший способ поддерживать связь с

друзьями или семьей – это использовать различные системы мгновенных сообщений. 7. Если у вас есть доступ в Интернет, вы можете читать новости, и проверять прогноз погоды в сети, смотреть фильмы, музыкальные видео в сети, играть в интерактивные игры и делать покупки через Интернет. 8. – Сколько времени потребуется, чтобы скачать этот видеофайл из сети? – Все зависит от скорости Интернета и размера файла. 9. – Как данные передаются по Интернету? – Вначале, с помощью межсетевого протокола файл необходимо разбить на небольшие порции данных, известных как пакеты данных, а затем данные восстанавливаются, как только достигают места назначения. 10. Ридер – это устройство, которое вмещает тысячи электронных книг, при этом оно легче большинства бумажных аналогов. 11. Последнее, что вам необходимо сделать – это переустановить пароль.

## *A. TEXT STUDY*

### **I. Read the text and match the headings (a-d) with the paragraphs (1-4).**

- a. Components of the Internet.
- b. The origin of the net.
- c. What the Internet is.
- d. How the net works.

### **Text A. The Internet**

1. The Internet is a global network connecting millions of computers. The largest number of Internet users is in China, followed by the United States and India. In the early days, most people just used the Internet to search for information. Today the Internet helps many people communicate, work, learn, and have fun.

2. The Internet enables computers to send one another small packets of digital data. For that to work, they use a common 'language' called TCP/IP (Transmission Control Protocol / Internet Protocol). If you are on the net, you have an IP address. This address is a way to identify a computer on the Internet. Packets of Internet data are transmitted through a variety of cables, routers and host computers on the way to their destination.

3. The Internet began in 1969 as ARPAnet, a U.S. Department of Defense project to create a computer network that could withstand a nuclear war. During the next two decades, the network that evolved was used mainly by universities, scientists and the government for research and communications. The nature of the Internet changed in 1992, when the U.S. government offered Internet access to the general public. The number of users grew rapidly into the millions and then hundreds of millions. The main reasons for this massive increase were the huge growth of the personal computer market, the invention of the World Wide Web by Tim Berners-Lee in the early 1990s, and the widespread adoption of broadband in the 2000s.

4. The Internet consists of multiple data systems. The most popular and important systems are:

WWW, the World Wide Web, a collection of files or pages containing links to other documents on the Internet. Most Internet services are now integrated on the Web.

E-mail, or electronic mail, for the exchange of messages and attached files. Mailing Lists are a combination of e-mail and discussion groups. Subscribe to a list and messages are distributed to your e-mail box.

Instant messaging (IM), a system for sending public and private messages to other users in real time over the Internet. You can chat privately with a friend, family member or business colleague. The latest IM programs also incorporate telephone, video and file-sharing facilities and are becoming an alternative to traditional video conferencing programs. The most popular instant messaging services include Skype, WhatsApp, Viber, Telegram, etc.

File Transfer Protocol (FTP), a system for transferring data files between computers via the Internet. Video conferencing, a system that allows transmission of video and audio signals in real time, so users can exchange data, talk and see one another on the screen. Some services also let you do video conferencing, such as Skype and Facebook Video Calling. VoIP (Voice over Internet Protocol), or Internet Telephone, a system that lets people make voice calls over the Internet.

## **II. Read the text again and decide if the following statements are true or false.**

1. The Internet is a network of networks.
2. The largest number of Internet users is in the UK.
3. Computers need to use the same File Transfer Protocol to communicate with each other.
4. Every computer connected to the Internet is given a unique address or IP number.
5. The Internet began as a military experiment.
6. The huge growth of personal computer market was one of the reasons for rapid growth of Internet users.
7. Tim Berners-Lee invented a broadband technology in the early 1990s.
8. Mailing Lists are based on programs that send messages on a certain topic to all the computers whose users have subscribed to a list.
9. Many IM services now offer audio and video capabilities.

## **III. What Internet system do these people use?**

1. I don't want to spend too much money on international phone calls, so I've found a cheaper way to talk to my friend from Canada.
2. I like receiving daily updates and headlines from newspapers on my computer.

3. I want to read people's opinions about current sporting events and express my views.

4. I'd like to check my students' draft essays on my computer and send them back with my suggestions.

5. I have designed a web page and want to transfer the data to my reserved web space.

6. I'd like to avoid flying to Hong Kong to attend the meeting but I want to see what's going on there.

#### **IV. Fill the gaps with the correct prefix from the list.**

**ir- , in- , up-, re- , dis- , down-, de- , con**

1. The printer was not working because someone had \_\_\_\_ connected it by mistake. 2. As the results are \_\_\_\_ regular, the program will have to be \_\_\_\_ written. 3. Flash drives are \_\_\_\_ expensive and \_\_\_\_ usable. 4. Once you finish your program, you will have to test it and \_\_\_\_ bug to remove all the mistakes. 5. If your mobile device has an Internet \_\_\_\_ nection, you can \_\_\_\_ load apps directly onto it. 6. Did you buy a full version of the OS or just an \_\_\_\_ grade? 7. If your computer crashes, you may have to \_\_\_\_ boot it.

#### ***B. TEXT STUDY***

##### **I. Read an article about net generation and decide which statement is true, false or not given.**

1. As the Net Generation Survey found, 75 % students message instantly while doing schoolwork.

2. The trend towards collaborative work is an inherent feature of Net Generation.

3. The blogs of Net Generation can't be referred to their online diaries causing emotional honesty in their online communications.

4. Net generation students expect open and personal connection with their professors.

5. Net Generation students are confident that evolving technology can cope with the challenges that affect the world.

6. Net generation students are keen on dealing with vital global environmental issue.

7. The majority of college professors tend to think that students are failing at small group discussions.

8. Students and professors are pushing for the online course components to include more of the multimedia Web experience the Net Generation is accustomed to.

9. Net Generation workers are indifferent to the expression of approval for their achievements.

10. For many of them, work will never be the center of their lives, and they search out employers who understand the importance of maintaining a healthy work-play balance.

### **How Net Generation Students Work**

Net Generation students are infamous for their multitasking skills and short attention spans. Growing up online, they're trained to quickly and simultaneously consume and process information from multiple media sources — and to ignore anything “boring” or otherwise uninspiring.

The Net Generation quickly shifts attention from one project to the next, always putting a high priority on speed. Sometimes that speed comes at a cost. Educators and researchers have found that the Net Generation lacks depth in its research and critical skills. Research shows that Net Generation college students are strong visual learners and weaker textual learners. One study examined a library class at California State University — Hayward, where students frequently ignored lengthy text directions for homework assignments. When the assignments were rewritten using images first, student scores increased. More than anything, Net Generation students are excellent collaborators. They're natural at networking and love to work in teams. For the Net Generation, collaboration can occur in the same classroom or with team members across the world. They're comfortable starting and maintaining online relationships and becoming “good friends” with people they've never met in person. The Net Generation is constantly connected. Not just to the Internet, but to each other. The powerful combination of cell phones, text messaging, instant messaging and e-mail means that Net Generation students are always mid-conversation with one or more friends either online, in person or both at the same time.

Social networking is a fancy word for a Net Generation way of life. The Net Generation Survey found that 69 percent of college students surveyed had a Facebook account. Net Generation students are open and emotionally honest in their online communications. For many, their blogs are literally online diaries, where no topic is taboo. With the popularity of YouTube, more and more students are posting blogs, or video blogs, that cut out the middle man by talking straight to the viewer. In contrast with cynical Generation X, the Net Generation is optimistic, positive and driven to succeed. High achievers, they crave rewards and accolades for their hard work. They're aware of the many significant problems affecting the world, but they're confident that through youthful innovation and ever-improving technology, these problems will be solved.

Net Generation students are no stranger to community service. Volunteer projects have been a part of their academic and extracurricular life since kindergarten. Because of this, they value work that has meaning and improves the lives of others. Net Generation college students are strongly motivated by academic projects that have a real-world component, particularly those that address a major issue like the environment, homelessness or poverty.

College campuses were some of the earliest adopters of ubiquitous high-speed wireless networks. That's because students expect to be connected anywhere and

everywhere. To that end, many colleges are trying to make other essential student services available online around-the-clock. These services include adding money to meal accounts, making doctor's appointments at the student health center and renewing library books online. Net Generation students expect the same availability from college administrators, staff and professors. They want to e-mail the director of the study abroad program and receive an answer quickly. Net Generation students work fast and make plans even faster. They need institutional infrastructures that can keep up with their pace.

College professors understand the traditional "lecture, read and test" method is failing to reach the Net Generation college student. Large lecture courses are regularly broken up into small group discussions. Microsoft PowerPoint presentations are popular, as are posting all presentations, lecture notes, assignments and syllabi online.

Businesses are also scrambling to understand and work alongside a new breed of employee. The focus should be on the product, not the process. Net Generation workers are still going to multitask. They'll have their iPod on, six browser windows open and three instant messaging conversations going while they're writing software code. The free flow of ideas is essential. An entry-level employee should be able to instant message a senior executive with an idea and expect a response. Employees should be able to set up virtual teams within offices and across different locations to develop new ideas independently.

Net Generation workers are used to the awards and accolades showered upon them as overachieving high school and college students, and the workplace should be no exception. Net Generation workers expect quick feedback from superiors and incentives for jobs well done, like extra vacation time or prizes.

**II. a) Speaking practice. Say which of the following ideas about the Internet may be considered as advantages and disadvantages. Think of any other pros and cons of the Internet.**

Public facility, worldwide, the information may not be true or correct, spend too much time playing games, make free calls, visit many interesting websites, make new friends, downloading software may contain viruses.

**b) Split into four groups and get ready to speak on one of the issues given below.**

1. The definition of the Internet.
2. How the Internet works.
3. The origin of the Internet.
4. Major components of the Internet.

**c) Most information on the Internet is on websites. Which features from the list below would you choose to make a good website? Give reasons for your choice.**

1. Simple and user-friendly navigation.
2. Complex design and a lot of animation.
3. Fast-loading pages.
4. Brightly-coloured text.
5. Minimal scroll.



6. Fresh content.
7. Low resolution photography.
8. Cross-platform / browser compatibility.

**III. What do the abbreviations URL, HTML, HTTP, CSS, PHP stand for? Read the text and check your answers.**

### **THE WORLD WIDE WEB**

Nowadays, the terms "Internet" and "World Wide Web" are often used interchangeably—but they're actually not the same thing. The Internet is the physical network of computers all over the world. The World Wide Web is a virtual network of websites connected by hyperlinks. Websites are stored on servers on the Internet, so the World Wide Web is a part of the Internet. A web browser is a kind of application you use to access the World Wide Web. Any Internet-connected device like a laptop, tablet or smartphone should come with a browser pre-installed. PCs come with Internet Explorer, and Macs come with Safari. If you prefer to use a different browser, you can download Firefox, Google Chrome, or Opera. Web pages are written with a simple coding system, called HTML (Hypertext Markup Language). A browser takes the HTML and translates it into the content you see on the screen. Websites often have links to other sites, also called hyperlinks. A web browser lets you navigate from one link to another. It also allows you to create bookmarks (or Favorites) for sites you like. To get to a webpage, you can type the URL (Uniform Resource Locator) into the browser address bar. The URL, also known as the web address, tells the browser exactly where to find the page. However, most of the time, people get to a webpage by following a link from a different page or by searching for the page using a search engine. If you type keywords or a phrase into a search engine, it will display a list of websites relevant to your search terms. A set of transfer rules, called HTTP (Hyper Text Transfer Protocol) is used to link Web files together across the Internet. This is why web page addresses begin with http, followed by a colon and two slashes.

Today, many web pages are not written in advance, but created dynamically in response to someone's input. This happens to answers to search engine queries and, for example, on shopping sites where people search for products within specific price ranges. As websites are becoming more sophisticated, web developers are using many more versatile tools. These include CSS (Cascading Style Sheets) and scripting languages such as JavaScript and PHP (Hypertext Preprocessor)

**IV. Using the words in *italics* complete these instructions about the process of navigation.**

*Web page, search engine, web browser, client, URL, website, surf, web server.*

1. Start up your computer and connect to the Internet.
2. Open your \_\_\_\_.
3. Type the \_\_\_\_ to access a website.

4. Your web browser sends the request to the correct \_\_\_\_ \_\_\_\_.
5. The server looks for the document and sends it to the \_\_\_\_ computer.
6. Your web browser displays the selected \_\_\_\_ \_\_\_\_ on the screen.
7. From the home page of the \_\_\_\_ you can \_\_\_\_ to other pages by clicking on hyperlinks.
8. If you want to find more websites use a \_\_\_\_ \_\_\_\_.

#### **V. Read a short text about E-mail and study the way we say e-mail addresses.**

An Internet e-mail address has a user name, the @ (at) symbol, and a domain name. The user name is the name you choose. The domain name has two parts separated by a dot (.). The first part is the network that receives the e-mail and the second is the top-level domain (TLD) which shows the type of organization, such as commercial (.com) or educational (.edu). Sometimes the TLD is a country code, such as .it (Italy).

#### **VI. Say these e-mail addresses.**

1. s\_luc@redtop.com.fr
2. wills547@yahoo.co.uk
3. client-info@tech.store.com.de
4. n.tigers@callserve.com
5. [mary-jones@hotmail.co.uk](mailto:mary-jones@hotmail.co.uk)

#### **VII. Translate the following sentences into English.**

1. С главной страницы веб-сайта вы можете перемещаться по нему, нажимая мышью на гиперссылки в тексте или на изображения. 2. Содержание электронного сообщения обычно включает текст, а также изображения, аудио-, видео- и программные файлы как прикрепленные. 3. Если у вас есть любое устройство, поддерживающее Интернет, вам остается только открыть браузер и начать просмотр в сети. 4. Электронная почта – это один из самых старейших и самых универсальных способов, чтобы общаться и обмениваться информацией в Интернете. 5. У вас обычно попросят адрес электронной почты при заказе билетов и гостиницы по Интернету или заполнении какой-нибудь формы заявления. 6. – Что тебе не нравится в этом сайте? – Он медленно загружается, и фон текста – черный. 7. Некоторые сайты магазинов используют виртуальную реальность, чтобы рекламировать свою продукцию в сети. 8. Этот принтер полностью совместим с любым ведущим программным обеспечением. 9. Сегодня существуют тысячи различных поисковых систем, доступных в Интернете. 10. Небезопасно открывать почтовые сообщения от неизвестных отправителей. Они могут содержать вирусы.

#### **VIII. Match the prefixes in column A to the correct endings in column B.**

column A

DOWN-

RE-

column B

-reader, -commerce, -mail

-time, -load

E-	-crime, -space, -slacking
UP-	-write, -boot, -set, -usable
CYBER-	-grade, -date, -load

### **IX. Complete these definitions with the words from Exercise VIII.**

1. \_\_\_ is to modify data in a file so that it has the most recent information.
2. \_\_\_ is the buying and selling of products and services over the Internet.
3. \_\_\_ is when a network or a computer is not working or unavailable for use.
4. \_\_\_ is to start the computer again.
5. \_\_\_ is the environment in which communication over computer networks occurs.
6. \_\_\_ is to add or replace hardware or software in order to expand the computer's power.
7. \_\_\_ is using a company's Internet access for activities which are not work-related, e.g. emailing friends, playing games, etc.

### **X. Practise conditional sentences.**

#### **a) Transform the following sentences according to the model.**

*(Model:) He runs round the park every morning, so he keeps very fit.  
If I ran round the park every morning, I would keep fit, too.*

1. He lives in the South, so he can grow a lot of flowers.
2. He lives near his work, so he is never late.
3. He goes to bed early, so he always wakes up in time.
4. They have a maid, so they can enjoy themselves.

#### **b) Put the verbs in brackets into the correct form.**

1. If he worked more slowly, he (not make) ..... so many mistakes.
2. I could give you his address if I (know) ..... it.
3. I (keep) .... a gardener if I could afford it.
4. What would you do if the lift (get) ..... stuck between two floors?
5. He (not go) ..... there, if his family were not invited.
6. If I (know) ..... her better, I (introduce)..... you.

#### **c) Answer the questions, using complete conditional sentences.**

1. If you had been born in 1960, how old would you have been in 1975?
2. If you had been late for this lesson, would you have apologized to the teacher?
3. What would you have done if there had been a holiday yesterday?
4. Could you have answered these questions correctly if you had been absent at the last lesson?

#### **d) Put the verbs in brackets into the correct tenses. Don't forget that there exist mixed types of conditional sentences.**

1. I had a sandwich for lunch. If I (have) ..... a proper lunch, I (not feel) ..... so hungry now.
2. He told his friend, "I'm not feeling very well. I (not be) ..... here today if I (not promise) ..... to come."
3. I can hardly keep my eyes open. If I (go) ..... to bed earlier last night, I (not be) ..... so tired

now. 4. He looked at his watch while he was driving and thought, "If I (not stop) ..... to get petrol, I (be) ..... home now." (use might)

**IX. Speak about Internet, instant messaging systems, file transfer protocols and e-mail using key words, phrases and the topic sentences.**

## **Unit VI. COMPUTER SOFTWARE. PROGRAMMING LANGUAGES**

### **VOCABULARY STUDY**

#### **Word List**

##### ***Nouns and noun phrases***

control flow — последовательность управляющих команд; computation — вычисление; spreadsheet software — программное обеспечение для табличных расчётов; freeware — бесплатное программное обеспечение; trial period — срок пробного пользования, период тестирования; charge — плата за оказываемые услуги; shareware — условно-бесплатное программное обеспечение; proprietary software — программное обеспечение собственной разработки; paradigm — категория; utility — служебная программа; script — сценарий; essence — сущность; back end developer — разработчик серверной части приложения; retail — розничная торговля; acronym — акроним, вид аббревиатуры, образованной начальными звуками; shortcut — быстрая клавиша;

##### ***Adjectives***

non-essential — несущественный; instant — мгновенный; open-source — с открытым исходным кодом; concurrent — для использования в многопоточной среде; relevant — релевантный, уместный; in-demand — востребованный; flexible — гибкий; robust — устойчивый к сбоям и ошибкам; numerical — численный;

##### ***Verbs and adverbs***

Execute — выполнять, запускать; ultimately — в конечном итоге; cause — быть причиной, вызывать; carry out — выполнять; edit — редактировать; debug — отладить, устранить ошибки; purchase — покупать; maintain — поддерживать в рабочем состоянии; distribute — распространять; track — отслеживать.

#### **I. Match the words with the definitions below.**

*Environment, programming language, trial period, source code, encompass, alter, requirement, familiar, assembler, feature.*

1. Testing period of time to discover how effective or suitable something or someone is.
2. Language for writing software.
3. The system in which a computer or computer program operates.
4. The set of computer instructions that have been written in order to create a program or piece of software.
5. A typical quality or an important part of something.
6. To include several different things.

7. A program that changes computer instructions into machine code (= a set of numbers that gives instructions to a computer).
8. An official rule about something that it is necessary to have or to do.
9. Easy to recognize because of being seen, met, heard, etc. before.
10. To change something, usually slightly, or to cause the characteristics of something to change.

**II. Using a dictionary add as many words as possible into the table.**

<i>Verbs</i>	<i>Adjectives</i>	<i>Nouns</i>
1. to alter		
2.		requirement
3. to execute		
4.	original	
5.		interpreter
6. to assemble		
7.		accessibility

**III. Choose the words with similar meaning from the two groups and arrange them in pairs.**

A. Load, debug, end-user, open-source, pass, provide, translate, programming language.

B. Application, software, programming language, editor, instruction, environment, software.

**IV. Complete the sentences with the word collocations below that describe the advantages of high-level languages.**

*Easy to detect and remove errors; Machine Independence; Built-in library functions; Easy to understand; Easy to learn; Easy to write program.*

There are several advantages of high-level programming languages. The most important advantages are:

a) ... - the high-level languages are easier to learn than low level languages. The statements written for the program are similar to English-like statements.

b) ... - the program written in high level language by one programmer can easily be understood by another because the program instructions are similar to the English language.

c) ... - in high level language, a new program can easily be written in a very short time. The larger and complicated software can be developed in few days or months.

d) ... - the errors in a program can be easily detected and removed. mostly the errors are occurred during the compilation of a new program.

e) ... - Each high-level language provides a large number of built-in functions or procedures that can be used to perform specific task during designing of new programs. In this way, a large amount of time of programmer is saved.

f) ... - program written in a high-level language is machine independent. It means that a program written in one type of computer can be executed on another type of computer.

## **V. Make up your own sentences using the following words and word combinations.**

*A collection of computer programs, to execute the software, high-level programming languages, different classes of computer software, provide an environment or platform, test, debug, compiler, interpreter, assembler, Freeware, Shareware, Open Source Software, Closed Source Software, Utility Software.*

## **VI. Translate into English.**

Программное обеспечение – наряду с аппаратными средствами, важнейшая составляющая информационных технологий, включающая компьютерные программы и данные, предназначенные для решения определенных задач.

В компьютерном жаргоне часто используется слово «софт» от английского software, которое в этом смысле впервые применил в журнале American mathematical Monthly математик из Принстонского университета Джон Тьюки (John W. Tukey) в 1958 г.

По назначению ПО разделяется на системное, прикладное и инструментальное. Системное программное обеспечение реализует связь аппаратного и программного обеспечения, выступая в качестве «межслойного интерфейса», с одной стороны которого аппаратура, а с другой приложения пользователя. Прикладное программное обеспечение призвано решать прикладные задачи пользователя. Например, финансовое управление, сеть поставок, управление транспортными расходами. Инструментальное программное обеспечение предназначено для использования в ходе проектирования, разработки и сопровождения программ. Виды инструментального ПО: текстовые редакторы, компиляторы, интерпретаторы, линковщики, отладчики, ассемблеры.

По способу распространения (доставки, оплаты, ограничения в использовании) ПО подразделяются на:

Freeware – бесплатное ПО, являющееся собственническим. Условия его распространения могут запрещать его копировать, изменять, распространять; Shareware – условно-бесплатное ПО. Пользователю предлагают пробную версию с напоминанием о необходимости оплаты использования программы. Основной принцип этого ПО: «попробуй, прежде чем купить»;

Proprietary ware – собственническое ПО. Правообладатель сохраняет за собой монополию на его использование, копирование, модификацию.

## **A. TEXT STUDY**

### **I. Read the text and answer the following questions.**

1. What does software include?

2. What does software execution mean?
3. What operations do computers carry out?
4. Who introduced the term 'software'?
5. What does system software coordinate?
6. Give examples of application software.
7. What software is used for creating both the system as well as application software?
8. Characterize some additional subcategories of software.

### **Text A. Different Classes and Types of Computer Software**

*Computer software* is a general term used to describe a collection of computer programs, procedures and documentation that perform some tasks on a computer system. Software includes websites, programs, video games, etc. that are coded by programming languages like C, C++, etc. The term “software” is sometimes used in a broader context to mean anything which is not hardware (which encompasses the physical interconnections and devices required to store and execute (or run) the software) but which is used with hardware, such as film, tapes, records, etc.

In computers, software is loaded into RAM and executed in the CPU. Once the software is loaded, the computer is able to execute the software. This involves passing instructions from the application software, through the system software, to the hardware which ultimately receives the instruction as machine code. Each instruction causes the computer to carry out an operation – moving data, carrying out a computation, or altering the control flow of instructions. Software is usually written in high-level programming languages that are easier and more efficient for humans to use (closer to natural language) than machine language. The term “software” was first used by John. W. Tukey in 1958.

A software is a collection of programs that help one to communicate with the hardware of the computer. There are different classes of computer software which are useful for several purposes.

*System Software* coordinates the complete system hardware and provides an environment or platform for all the other types of software to work in. It is the most basic type of software in any computer system, which is essential for other programs, applications and indeed for the whole computer system to function. For desktop computers, laptops and tablets System software examples are Microsoft Windows 10, Mac OS, Linux, Ubuntu, devices drivers, etc. For smartphones: Apple’s iOS, Google’s Android, Windows Phone OS.

*Application Software* comprises those programs that help the user perform tasks of his/ her choice. They are non-essential software which are installed and run depending upon the requirements, in the environment provided by the system software. Application software examples are MS Office, Open Office, Media Players, educational software, media development software, antivirus software, etc.

There are some examples of application software that allow you to do specific work: **MS Excel:** It is spreadsheet software that you can use for presenting and analyzing data. **Photoshop:** It is a photo editing application software by Adobe. You

can use it to visually enhance, catalogue and share your pictures. **Skype:** It is an online communication app that you can use for video chat, voice calling and instant messaging.

*Programming software* is used to write, test, debug, and develop other software programs and applications. They are used for creating both the system as well as application software.

Programming software is used by software programmers as translator programs. They are facilitator software used to translate programming languages (i.e., Java, C++, Python, PHP, BASIC) into machine language code. Translators can be compilers, interpreters and assemblers. You can understand compilers as programs that translate the whole source code into machine code and execute it. Interpreters run the source code as the program is run line by line. And assemblers translate the basic computer instructions – assembly code – into machine code.

Different programming language editors, debuggers, compilers and Integrated Development Environments (IDE) are examples of programming software. For example: Eclipse – a Java language editor; Coda – programming language editor for Mac; Notepad++ – an open-source editor for Windows; Sublime Text – a cross-platform code editor for Mac, Windows, and Linux.

There are **five additional subcategories of software**. These are: Freeware; Shareware; Open Source Software; Closed Source Software; Utility Software.

*Freeware software* is any software that is available to use for free. They can be downloaded and installed over the internet without any cost. Some well-known examples of freeware are: Google Chrome; Skype; Instagram; Snapchat; Adobe reader. Although they all fall under the category of Application or end-user software, they can further be categorized as freeware because they are free for you to use.

*Shareware*, on the other hand, are software applications that are paid programs, but are made available for free for a limited period of time known as ‘trial period’. You can use the software without any charges for the trial period but you will be asked to purchase it for use after the trial ends. Shareware allows you to test drive the software before you actually invest in purchasing it. Some examples of Shareware that you must be familiar with are: Adobe PhotoShop; Adobe Illustrator; Netflix App; Matlab; McAfee Antivirus.

*Open Source Software* is a type of software that has an open-source code that is available to use for all users. It can be modified and shared with anyone for any purpose. Common examples of open source software used by programmers are: LibreOffice; PHP; GNU Image Manipulation Program (GIMP).

*Closed Source Software*. These are the types of software that are non-free for the programmers. For this software, the source code is the intellectual property of software publishers. It is also called ‘proprietary software’ since only the original authors can copy, modify and share the software. Following are some of the most common examples of closed-source software: .NET; Java; Android; Microsoft Office; Adobe PhotoShop.

*Utility software* is considered a subgroup of system software. They manage the performance of your hardware and application software installed on your



computer, to ensure they work optimally. Some features of utility software include: Antivirus and security software; File compressor; Disk cleaner; Disk defragmentation software; Data backup software.

There can be multiple ways to classify different types of computer software. The software can be categorized based on the function they perform such as Application software, System software, Programming Software, and Driver software. They can also be classified based on different features such as the nature of source code, accessibility, and cost of usage.

## II. Study the table, analyze and describe different types of software.

Application Software Type	Examples
<b>Word processing software:</b> Tools that are used to create word sheets and type documents etc.	Microsoft Word, WordPad, AppleWorks and Notepad
<b>Spreadsheet software:</b> Software used to compute quantitative data.	Apple Numbers, Microsoft Excel and Quattro Pro
<b>Database software:</b> Used to store data and sort information.	Oracle, MS Access and FileMaker Pro
<b>Application Suites:</b> A collection of related programs sold as a package.	OpenOffice, Microsoft Office
<b>Multimedia software:</b> Tools used for a mixture of audio, video, image and text content.	Real Player, Media Player
<b>Communication Software:</b> Tools that connect systems and allow text, audio, and video-based communication.	MS NetMeeting, IRC, ICQ
<b>Internet Browsers:</b> Used to access and view websites.	Netscape Navigator, Microsoft Edge, and Google Chrome
<b>Email Programs:</b> Software used for emailing.	Microsoft Outlook, Gmail, Apple Mail

## III. Choose the best option to the following statements.

- In computers, software is loaded into ... and executed in the CPU.
  - ROM
  - RAM

- c) CPU
- 2. Each instruction causes the computer to ... an operation.
  - a) execute
  - b) promote
  - c) change
- 3. Software is usually written in ... languages.
  - a) mark up
  - b) assembler
  - c) high-level
- 4. The software can be categorized based on ... .
  - a) different features such as the nature of source code, accessibility, etc.
  - b) the function they perform.
  - c) all of the above.
- 5. ... can be modified and shared with anyone for any purpose.
  - a) Utility software
  - b) Shareware
  - c) Open source software

#### **IV. Choose the correct word to fill the spaces.**

1. Turn on your computer. It will usually take a few minutes to \_\_\_\_\_.
  - a. boot itself b. boot up c. get booted
2. Windows XP, Macintosh OSX and Linux are \_\_\_\_\_.
  - a. operating systems b. operating tools c. operators
3. On my computer, I have a picture of my cat as the \_\_\_\_\_.
  - a. desktop background b. desktop picture c. desktop scene
4. Microsoft Word, Adobe Acrobat and CorelDraw are programs or \_\_\_\_\_.
  - a. applicators b. appliers c. applications
5. To open Microsoft Word, click on the \_\_\_\_\_.
  - a. picture b. symbol c. icon
6. I keep all my digital photos in a \_\_\_\_\_ called "Photos".
  - a. folder b. packet c. box
7. Is it possible to open Microsoft Excel \_\_\_\_\_ in Word?
  - a. texts b. files c. pages
8. In Microsoft Word, to start typing a new letter, open a new \_\_\_\_\_.
  - a. document b. page c. paper
9. When you \_\_\_\_\_ a document, it's sent to the recycle bin.
  - a. destroy b. erase c. delete
10. Deleted documents stay in the recycle bin until you \_\_\_\_\_ it.
  - a. wash b. empty c. clean
11. In Windows, the icon is just a \_\_\_\_\_ to the application. If you delete the icon, the application will still be on your computer.
  - a. connector b. shortcut c. link
12. If the computer crashes, you can try pressing the \_\_\_\_\_ button.

a. restart b. recommence c. replay

13. When I've finished using my computer, I always \_\_\_\_\_.

a. close it down b. shut it down c. shut it off

14. If I leave my computer on without using it, after a while it goes into \_\_\_\_\_ mode.

a. stand down b. waiting c. standby

## ***B. TEXT STUDY***

### **I. Read the text and answer the following questions.**

1. What is a programming language used for?

2. What are the types of programming languages?

3. Characterize some of the most relevant and in-demand languages?

### **Types of programming languages**

A programming language is a computer language that a programmer uses to develop software programs, scripts, or other sets of instructions for computers to execute.

Although many languages share similarities, each has its own syntax. Once a programmer learns the languages rules, syntax, and structure, they write the source code in a text editor or IDE. Then, the programmer often compiles the code into machine language that can be understood by the computer. Scripting languages, which do not require a compiler, use an interpreter to execute the script.

Each of the different programming languages mentioned can be broken into one or more of the following types (or paradigms) of languages.

High-level (most common) / low-level; Declarative / imperative / procedural; General-purpose / domain-specific; Object-oriented / concurrent; Command / Compiled / Script language; Answer set. A language can also be broken into one of five generation languages. Today, there are hundreds of different programming languages.

*Application and program development* involve programs you work with on a daily basis. For example, the Internet browser you are using to view this web page is considered a program. If you are interested in developing a program, consider the following languages: C, C#, C++, Java, Swift, Visual Basic.

*Artificial intelligence* or related fields involve creating the character interactions in computer games, portions of programs that make decisions, chatbots, and more. If you're interested in developing an AI, consider the following languages: AIML, C, C#, C++, Prolog, Python.

*Database* developers create and maintain databases. If you're interested in creating or maintaining a database, consider any of these: DBASE, FoxPro, MySQL, SQL, Visual FoxPro.

*Game development* involves creating computer games or other entertainment software. If you're interested in developing a game, consider these: C, C#, C++, DarkBASIC, Java.

*Computer drivers* and programming hardware interface support are a necessity for hardware functionality. If you're interested in developing drivers or software interfaces for hardware devices, consider these: Assembly, C.

*Internet and web page development* are the essence of the Internet. Without developers, the Internet would not exist. If you're interested in creating web pages, Internet applications, or other Internet-related tasks, consider these languages: HDML, HTML, Java, JavaScript, Perl, PHP, Python, XML.

There are dozens of programming languages used in the industry today. Let us overview some most important, relevant and in-demand of these languages.

**Python** is an advanced programming language that is interpreted, object-oriented and built on flexible and robust semantics. Python was developed in the late 1980s in the Netherlands and first released to the public in 1991. Python is used by developers, software engineers, back end developers, Python programmers, also by employers in information technology, engineering, professional services and design in scientific and numeric computing; desktop graphical user interfaces (GUIs). Python lets you work quickly to integrate systems as a scripting or glue language. It's also suited for Rapid Application Develop (RAD). NASA uses Python in its Integrated Planning System as a standard scripting language. It is simple to learn and easily read.

**Java** is a general-purpose, object-oriented, high-level programming language with several features that make it ideal for web-based development. Originally known as Oak, Java was developed in 1990 at Sun Microsystems to add capabilities to the C++ language. Java was developed according to the principle of WORA (Write Once Run Anywhere). The language was introduced to the public in 1995 and is now owned by Oracle. It is used by software engineers, Java developers, by employers in communications, education, finance, health sciences, hospitality, retail, Internet of Things (IoT), Cloud Computing, etc.

Java is used to develop enterprise-level applications for video games and mobile apps, as well as to create web-based applications with JSP (Java Server Pages). When used online, Java allows applets to be downloaded and used through a browser, which can then perform a function not normally available. Programs that use or are written in Java include Adobe Creative Suite, Eclipse, Lotus Notes, Minecraft and OpenOffice. Java is the core foundation for developing Android apps. Its features are application portability, robust and interpreted language, extensive network library.

**Ruby** is an open-sourced, object-oriented scripting language that can be used independently or as part of the Ruby on Rails web framework. Designed in 1995, it is used by software engineers, data science engineers, employers in technology, engineering, professional services, design, science and quality control, Web App Development, Robotics, Networking. Ruby is used for simulations, 3D modeling, and to manage and track information. Amazon, Twitter were created using Ruby on Rails. It is free to use, copy, modify and distribute.

**HTML** is the standard markup language used to create web pages; it ensures proper formatting of text and images (using tags) so that Internet browsers can

display them in the ways they were intended to look. HTML was created by physicist Tim Berners-Lee in 1990 to allow scientists to share documents online. Is used by Web developers, technical editors, email designers, software engineers. HTML is used to create electronic documents (pages) displayed online. Visit any page and you will see an example of HTML in action. The diversity and complexity in the structure and appearance of today's sites is made possible with HTML. It is free and accessible, multiple versions are available.

**JavaScript** is a client-side programming language that runs inside a client browser and processes commands on a computer rather than a server. Despite its name, JavaScript is not related to Java. JavaScript was designed by Netscape and originally known as LiveScript, before becoming JavaScript in 1995. It used by Khan Academy, Linkedin, Yahoo, etc. JavaScript is used primarily in Web development to manipulate various page elements and make them more dynamic, including scrolling abilities, printing the time and date, creating a calendar and other tasks not possible through plain HTML.

**C Language** is a structure-oriented, middle-level programming language mostly used to develop low-level applications. It was developed in 1972 at Bell Labs specifically for implementing the UNIX system. It eventually gave rise to many advanced programming languages, including C++, Java C#, JavaScript and Pearl. It is used by employers in Microsoft, Apple, Oracle, in Embedded Systems, Systems Programming, Artificial Intelligence, Industrial Automation, Computer Graphics, Space Research, Image Processing and Game Programming. C Language is used to develop systems applications that are integrated into operating systems such as Windows, UNIX and Linux, as well as embedded software. Applications include graphics packages, word processors, spreadsheets, operating system development, database systems, compilers and assemblers, network drivers and interpreters.

**C++** is a general purpose, object-oriented, middle-level programming language and is an extension of C language, which makes it possible to code C++ in a "C style". In some situations, coding can be done in either format, making C++ an example of a hybrid language.

**C#** (pronounced C-sharp) is a multi-paradigm programming language that features strong typing, imperative, declarative, functional, generic, object-oriented and component-oriented disciplines. C# helps developers create XML web services and Microsoft .NET-connected applications for Windows operating systems and the internet. It is similar to Java in capabilities and ideal for beginners.

**PHP** (Hypertext Preprocessor) is an open-source scripting language designed for creating dynamic web pages that effectively work with databases. It is also used as a general-purpose programming language.

**SQL** (Structured Query Language) is a database query language that allows adding, accessing and managing content in a database. It is the language that allows programmers to perform the common acronym CRUD (Create; Read; Update; Delete) within a database.

**Swift** is Apple's newest open-source, multi-paradigm programming language for iOS and OS X apps. Swift integrates Objective-C's named parameters and

object-oriented model, while including an advanced compiler, debugger and framework infrastructure.

**II. Comprehension Check. State whether the statements are true or false. Correct if necessary.**

1. When a programmer learns the languages rules, syntax, and structure, he/she can write a programming language in a text editor or IDE.
2. Scripting languages use a compiler as well as an interpreter to execute the script.
3. Database developers involve creating the character interactions in computer games.
4. Python lets you work quickly to integrate systems as a scripting or glue language.
5. Java was developed according to the principle of interchangeability.
6. C++ was developed in 1972 at Bell Labs specifically for implementing the UNIX system.
7. C# helps developers create XML web services and Microsoft .NET-connected applications for Mac OS.
8. Swift is Apple's newest open-source, multi-paradigm programming language for iOS and OS X apps.

**III. Insert the missing words.**

*Close, drag and drop, find, free up, installed, launch, password, renamed, running, save, search, start menu, uninstalling, user, window.*

1. I couldn't open the document you emailed me. I don't have Microsoft Word \_\_\_\_\_ on my computer.
2. Click on that icon to \_\_\_\_\_ Google Chrome.
3. I \_\_\_\_\_ an important document, and now I can't find it.
4. If your computer is \_\_\_\_\_ several applications at the same time, it's more likely to crash. It's better to \_\_\_\_\_ the applications. you're not using.
5. You can access all the applications on your computer from the \_\_\_\_\_.
6. You can view two Word documents on the screen at the same time. You just open a new \_\_\_\_\_.
7. It's easy to move files into a folder. You can just \_\_\_\_\_.
8. I asked the computer to \_\_\_\_\_ for files with "English" in the name, but it didn't \_\_\_\_\_ any.
9. This is a shared computer. Each \_\_\_\_\_ has their own \_\_\_\_\_.
10. You can \_\_\_\_\_ space on your hard drive by \_\_\_\_\_ applications you never use.
11. If you \_\_\_\_\_ your photos as JPEGs instead of TIFFs, you'll use a lot less memory.

**IV. Match the words with the punctuation marks and symbols.**

1. Full stop 2. comma 3. exclamation mark 4. question mark 5. single quotes  
6. double quotes 7. dollar sign 8. percentage sign 9. ampersand 10. asterisk 11. hash  
12. brackets 13. left bracket 14. square brackets 15. underscore 16. hyphen 17. plus  
sign 18. equals sign 19. colon 20. semicolon 21. "at" sig 22. forward slash 23.  
backward slash 24. Arrow

a. ! b. @ c. , d. & e. . f. = g. 'Hello' h. → i. \*j. "Hello" k. \_ l. - m. ? n. / o. ( )  
p. \$ q. \ r. [ ] s. % t. ( u. # v. : w. + x. ;

## **V. Speak about different types of computer software and programming languages.**

### **Unit VII. OPERATION SYSTEMS**

#### **VOCABULARY STUDY**

#### **Word List**

##### ***Nouns and noun phrases***

Utilization — использование; allocation — размещение, распределение;  
detection — обнаружение; pen drive — флеш-накопитель; process scheduling —  
многозадачный режим, диспетчеризация процессов; collective — совокупность;  
request — запрос; response — ответ, отклик; aid — помощь; buffer delay —  
задержка буфера; accounting — учёт использования ресурсов; constraint —  
ограничение; delay — задержка;

##### ***Adjectives and collocations***

Predictable — предсказуемый; unauthorized — неавторизованный,  
неразрешенный; similar — похожий;

##### ***Verbs, Adverbs***

Occur — происходить, случаться; perform batch job — выполнять работу в  
пакетном режиме; assign — назначать.

#### **I. Match the words with the definitions below.**

*Allocation, batch, capability, unauthorized, assign, disastrous, impact, queue, requirement.*

1. A group of things that are dealt with or produced at the same time, or a group of people who are similar in some way.
2. To give a particular job or piece of work to someone.
3. Extremely bad or unsuccessful.
4. The process of giving someone their part of a total amount of something to use in a particular way.
5. The ability or power to do something.
6. Without someone's official permission to do something or be in a particular place.
7. An official rule about something that it is necessary to have or to do.

8. A powerful effect that something, especially something new, has on a situation or person.
9. A list of jobs that a computer has to do.

## II. Using a dictionary add as many words as possible into the table.

<i>Verbs</i>	<i>Adjectives</i>	<i>Nouns</i>
1. to manage		
2.		detection
3. to perform		
4.	attached	
5.		allocation
6. to predict		
7.		requirement

## III. Choose the words with similar meaning from the two groups and arrange them in pairs.

- A. Keep, sense, multi-programming, internal, device, error, process, unauthorized;  
 B. Memory, user, scheduling, management, general, a track, environment, prevention.

## IV. Complete the sentences with the words below. You may have to change some words slightly.

*Data, virus attack, log, response time, frequency, unauthorized access, password, task, boost, system performance.*

Security is provided by OS to the user data and prevents (1). Data can be protected by giving the (2) to the files. When an unknown user checks the files, OS asks for the password and hence the (3) is protected. The system itself is protected with a password. This helps in checking the persons who (4) into the system.

System performance is maintained with the help of the OS. It monitors the (5) taken by the system after the service request. If there is any unusual variation in the time, OS monitors the (6) and brings the issue into the user's notice. High variation or very low variation can be the result of any (7). The user is notified to bring the necessary changes. Various applications or tasks and the number of users doing the (8) are accounted for by OS. This helps to know the number of users and the (9) of application usage.

## V. Correct the definitions. Put the derivatives of the word LOAD given in bold into their proper places in the sentences.

1. If you have something **overloaded** you have the information or software applications loaded for you before you start using it.
2. If you have something **freeloaded** you want the information to be shown on the screen again, usually because there has been a problem or because you want the information to be as new as possible.
3. If you have something **downloaded** you copy or move programs or



information to a larger computer system or to the Internet. 4. If you have something **uploaded** you copy or move programs or information into a computer's memory, especially from the internet or a larger computer. 5. If you have something **reloaded** you load it onto your computer without being charged. 6. If you have something **preloaded** your computer is supplied with too much information to be processed.

## **VI. Translate the following sentences into English.**

1. Операционная система организует работу как программного, так и аппаратного обеспечения ПК: одновременный запуск нескольких приложений, обработку и выполнение команд центральным процессором, сохранение файлов на ПК или внешнем жестком диске, управление памятью компьютера и другие функции. 2. Таким образом, набор ключевых функций ОС включает в себя установку программных утилит для настройки работы приложений и устройств компьютера. 3. Операционная система выполняет ключевую роль в обеспечении работы как встроенных, так и загружаемых приложений. 4. По статистике, пользователи операционной системы Windows составляют около 90%, в то время как Mac пользуется только около 10%. На самом деле, первая является более доступной и дешевой для пользователей ПК, а последняя более дорогой. 5. Многие программисты пользуются операционной системой Linux, главное преимущество которой, – ее открытый доступ, позволяющий пользователю редактировать системные утилиты. Данная ОС является более надежной, защищенной от шпионских расширений и менее подверженной вирусным атакам. 6. Командный интерфейс менее удобен в использовании, чем графический интерфейс, так как каждое меню быстрого доступа, всплывающее и выпадающее меню предлагают пользователю широкий выбор опций, доступных нажатием клавиши мышки. 7. – Какая операционная система установлена на твоём смартфоне? – Это Андроид. Она поддерживает различные приложения и регулярно обновляется.

### *A. TEXT STUDY*

#### **I. Read the text and answer the following questions.**

1. What is the definition of an Operating System?
2. How does an operating system manage hardware resources?
3. What are the functions of OS?
4. What allocates and de-allocates the device efficiently?
5. What is a File System?
6. What is job accounting used for?
7. What can a broad family of operating systems be categorized into?
8. What types can Real Time systems be classified into?

### **TEXT A. Operating Systems**

An Operating System (OS) is a powerful program that manages and controls the software and hardware on a computing device so as to make the device behave in a predictable but flexible way. An OS acts as an interface between a user and a

device. Thus, in general sense, an OS is that software which helps a user to run other applications on his computing device.

All the computers and computer-like devices comprise Operating System, including laptop, desktop, or any other smart computing system like a smart phone or a smart watch. Some of the popular OS are Linux, OS X, WINDOWS, VMS, OS/400, AIX, z/OS, etc.

The OS performs multiple functions and management. It manages computer's hardware resources by performing required services:

**Front end management of hardware resources.** It manages Input and Output devices such as a mouse, keyboard, display monitors, scanners and printers; it manages network devices such as routers, modems and network connections; it manages storage devices, both internal and external drives.

**Back end utilization of software applications for managing hardware resources.** It manages the allocation of internal memory between multiple applications. An OS sends message about the status of operation and any error that may have occurred to the interactive user. It helps in performing batch jobs for example, printing etc. Depending on the capability of devices that can offer parallel processing, a program is managed by OS such that it can run on more than one processor at a time.

The functions of an OS include: Memory Management. Device Management. Processor Management. File Management. Controls System Performance. Security. Error Detection. Coordination among Software and Users. Job accounting.

*Memory Management.* One of the main functions of OS is to manage the primary and secondary memory. All the memory devices such as hard disk, pen drive etc. are managed by OS. Memory management keeps an eye on each and every memory location, in any case either it is allocated or it is not allocated (free). Memory allocation to the processes is also decided and checked by Operating System. It decides and checks which process will obtain memory and at what time.

*Device Management.* An OS with help of their respective drivers manages device communication. Following activities are performed by an Operating System for device management: It keeps a track of all devices. This task is performed by I/O controller. It decides which process will get the device, when and for how long. It allocates and de-allocates the device efficiently.

*Processor Management.* In a multi-programming environment, it is OS which decides which process will get the processor when and for how long. This task is called Process Scheduling. Following activities are done by OS for processor management: It keeps a track of processor tasking and checks the status of process. Traffic controller performs this task. It allocates the processor and also de-allocates processor when a process is complete and not required.

*File Management.* In a file system, generally directories are organized for usage and easy navigation. Following activities are performed by an OS under file management: It keeps a track of location, information, status etc. This collective is known as File System. It decides who will get the resources. It allocates and de-allocates the resources.

*Controls System Performance.* An OS records delays between a request and response of the system.

*Security.* An OS by using password and other similar techniques prevents and checks unauthorized users to access the data and program.

*Error Detection.* By using various error detecting aids an operating system helps in prevention of errors.

*Coordination among Software and Users.* It Coordinates and assigns compilers, assemblers, interpreters and other software to users.

*Job accounting.* It keeps a track of resources and jobs used by different users all the time.

### **Types of Operating Systems**

The broad family of operating systems can be categorized in to four types based on their controlling and supporting systems. These types of Operating System are: *Real Time Operating System (RTOS)*; *Single User Single Task OS*; *Single User Multi Tasking OS*; *Multi User OS*.

A *Real Time Operating System (RTOS)* intends to provide real time applications that process data without buffer delays. A Real Time Operating System is a time bound operating system which has fixed time constraints. Processing has to be done within the defined time constraints or the system will definitely fail. Examples of Real Time systems are Air Traffic Control Systems, Command Control Systems etc.

Real Time systems are classified in three types depending on two factors i.e. on factors inside the computer system and factors outside the computer system. A missed deadline in Hard Real Time Systems is disastrous. In case of Soft Real Time Systems it may lead to a significant loss. In Firm RTOS, the deadline is specified but missing it does not cause a big impact.

Command Control systems and Air traffic control systems are best examples of Hard Real Time systems. Online transaction systems, like booking a movie ticket or airline reservation systems are best examples of Soft Real Time systems. Multimedia applications is one example of Firm RTOS.

*Single User Single Task Operating System.* As the name indicates, Single User Single Task OS is a system in which only one program is executed at one time. It manages the computer in a way that one user can successfully perform one thing at a time. There is a problem with these types of Operating System that the program has to be arranged in a queue.

*Single User Multi Tasking Operating System.* Most people use this Operating-System on their computers, laptop and desktops today. Best examples of these types of Operating System are Apple's Mac OS platform and Microsoft's Windows. This Operating System will allow a single user to operate several programs at the same time. For example, a Windows user may be writing an e-mail while printing a word document while downloading a file from Internet.

*Multi User Operating System* allows various different users on different desktop or computer to access a single System. A user at the terminal or desktop,

through a network takes access of the system and other system attached machines such as printers.

The Operating System takes care of all the requirements of the various users in a balanced manner. Also, it ensures that each of the programs being used has a separate and sufficient resource so that problem of one user doesn't affect the entire community of users.

## **II. Choose the best option to the following statements.**

1. An OS acts an interface between ...
  - a) a user and a troubleshooter.
  - b) a device and a developer.
  - c) a user and a device.
2. The OS performs multiple functions and management. It manages
  - a) computer's hardware resources.
  - b) computer's software resources.
  - c) computer's spyware resources.
3. The functions of an OS include:
  - A) Memory Management. Device Management. Processor Management.
  - b) File Management. Controls System Performance. Security. Error Detection.
  - c) all of the above
4. File management keeps a track of ...
  - a) location, information, status etc.
  - b) input/output devices.
  - c) processor tasking and checks the status of process.
5. Real Time systems are classified in three types:
  - a) Hard Real Time Systems, Soft Real Time Systems, Firm RTOS.
  - b) Single User Single Task system; Single User system; Multi Tasking system.
  - c) Command control systems; Traffic control systems; Air traffic control systems.

## **III. Comprehension Check. State whether the statements are true or false. Correct if necessary.**

1. An OS is that hardware which helps a user to run other applications on his computing device.
2. Back end utilization of software applications for managing hardware resources manages the allocation of external memory between multiple applications.
3. One of the main functions of OS is to manage the primary and secondary memory.
4. An OS records errors between a request and response of the system.
5. Operating System will allow a single user to operate several programs alternatively.
6. An OS by using password and other similar techniques prevents and checks unauthorized users to access the data and program.
7. OS keeps a track of processor tasking and checks the status of process for error detection.
8. Real Time systems are classified in three types depending on two factors i.e. on factors inside the computer system and factors outside the computer system.

**IV. Complete the sentences with one of the words in the necessary form.**

*Utilities, configuration, core, modify, tend, distribute, drop-down, account for, preloaded, pull-down, upgrade, enhanced, task bar, platforms.*

1. There are several \_\_\_\_ functions that the operating system performs such as starting and shutting down a computer, \_\_\_\_ provision, devices \_\_\_\_ and others.
2. Operating systems usually come \_\_\_\_ on any computer you buy, but it is possible to \_\_\_\_ it.
3. Apple and Windows OSs have developed \_\_\_\_ software being regularly upgraded.
4. A user gets access to system functions by selecting program icons as well as other items from \_\_\_\_ and \_\_\_\_ menus and the \_\_\_\_.
5. In fact, most computing resources are built on the Windows and Apple \_\_\_\_.
6. Linux is the only open-source operating system, the flavor of which is the possibility for any user to \_\_\_\_ and \_\_\_\_ it.
7. Apple computers, which \_\_\_\_ 9.5% of the operating systems market, \_\_\_\_ to be much more expensive.

**V. Choose the necessary modal verb.**

1. The senior manager (can/is to/ might) check the ongoing updates of a new system.
2. To be loaded successfully the file (have to/ could/ should) be free of viruses.
3. The Start menu (may/should/ought to) provide a customizable list of programs for the user.
4. The start menu of a new OS Windows (had to/could/might) be expanded to encompass various My Documents folders.
5. Social bookmarking websites (are to /can/may) centralize online services, which allow users to store and share Internet bookmarks.
6. A screenshot reader is a form of assistive technology (AT) which (have to/can/ should) be very useful for people who are blind.

**VI. Speaking. Choose an operating system and speak about its usability.**

**Use the prompts below. Share your opinion with the groupmates.**

*Usability, interface, advantages and disadvantages, most common applications, ease of use and prospects of developing.*

**B. TEXT STUDY**

**I. Read the text and answer the following questions. Entitle the text.**

1. What did IBM contact Bill Gates for?
2. Was MS-DOS successful enough to dominate the IBM PC market?
3. Who invented the GUI (Graphical User Interface)? What is GUI?
4. What did Steve Jobs embark on an Apple?
5. What company was strongly influenced by the success of the Macintosh?
6. What was the first iOS for Apple's mobile operating system?
7. What new features were added to the OS Windows 7?
8. When did Google launch Chrome OS?
9. What are we to expect in the future OS?

In the early 1980s, IBM designed the IBM PC and looked around for software to run on it. People from IBM contacted Bill Gates to license his BASIC interpreter. They also asked him if he knew of an operating system to run on the PC. Gates suggested that IBM contact Digital Research, then the world's dominant operating systems company. Consequently, IBM went back to Gates asking if he could provide them with an operating system.

When IBM came back, Gates realized that a local computer manufacturer, Seattle Computer Products, had a suitable operating system, DOS (Disk Operating System). Gates then offered IBM a DOS/BASIC package, which IBM accepted. IBM wanted certain modifications, so Gates hired the person who wrote DOS, Tim Paterson, as an employee of Gates' company, Microsoft, to make them. The revised system was renamed MS-DOS (MicroSoft Disk Operating System) and quickly came to dominate the IBM PC market.

Although the initial version of MS-DOS was fairly primitive, subsequent versions included more advanced features, including many taken from UNIX. CP/M, MS-DOS, and other operating systems for early microcomputers were all based on users typing in commands from the keyboard. That eventually changed due to research done by Doug Engelbart at Stanford Research Institute in the 1960s. Engelbart invented the GUI (Graphical User Interface), complete with windows, icons, menus, and mouse. These ideas were adopted by researchers at Xerox PARC and incorporated into machines they built.

One day, Steve Jobs, who co-invented the Apple computer in his garage, visited PARC, saw a GUI, and instantly realized its potential value, something Xerox management famously did not. Jobs then embarked on building an Apple with a GUI. This project led to the Lisa, which was too expensive and failed commercially. Jobs' second attempt, the Apple Macintosh, was a huge success, not only because it was much cheaper than the Lisa, but also because it was user friendly, meaning that it was intended for users who not only knew nothing about computers but furthermore had absolutely no intention whatsoever of learning.

When Microsoft decided to build a successor to MS-DOS, it was strongly influenced by the success of the Macintosh. It produced a GUI-based system called Windows. For about 10 years, from 1985 to 1995, Windows was just a graphical environment on top of MS-DOS. However, starting in 1995 a freestanding version of Windows, Windows 95, was released that incorporated many operating system features into it, using the underlying MS-DOS system only for booting and running old MS-DOS programs. In 1998, a slightly modified version of this system, called Windows 98 was released. Nevertheless, both Windows 95 and Windows 98 still contain a large amount of 16-bit Intel assembly language.

Another Microsoft operating system is Windows NT (NT stands for New Technology), which is compatible with Windows 95 at a certain level, but a complete rewrite from scratch internally. It is a full 32-bit system. Version 5 of Windows NT was renamed Windows 2000 in early 1999. That did not quite work

out either, so Microsoft came out with yet another version of Windows 98 called Windows Me (Millennium edition).

On March 6, 2008, iPhone OS 1 was the first iOS for Apple's mobile operating system. No official name was given to the system. Apple stated that the iPhone ran on a version of its desktop operating system macOS, then known as Mac OS X. When Apple released the iPhone software development kit (iPhone SDK), it then named the operating system as iPhone OS which later on became iOS.

On September 23, 2008, Android was released. Android is a Mobile OS which was developed by Google. Based on the Linux Kernel and other Open Source software. It is designed mainly for Touchscreen devices although there are other renditions of the OS. Android is iOS's first major competitor.

On October 22, 2009, Microsoft launched Windows 7 internationally to the public.

Windows 7 was intended to be an upgrade of Windows Vista, its predecessor and addressed Vista's poor critical reception while maintaining its hardware and software compatibility.

New features were also added to the OS such as Libraries, HomeGroup — a file sharing system, support for multi-touch input, "Action Center" interface for an overview of maintenance information and system security, and edits were made to the User Account Control to make it less intrusive.

On May 2011 Google launched Chrome OS which is a Linux Kernel based OS. It is a free software which uses the Google Chrome web browser as it's a primary user interface (UI) and supports web applications.

Its User Data runs directly off of the cloud, making it the first OS to be cloud-based.

After reviewing some of the most well-known operating systems through the generations, it is evident that there has been a huge advancement in the world of operating systems and how these systems have become more user-friendly and graphics-oriented in order to deliver the best product for engagement to the end user.

Looking at all the OS predecessors there is a lot more to expect in the future.

We are currently on the precipice of AI, robotics, and blockchain and these sectors will lead us towards different dimensions of Operating Systems.

## **II. Comprehension Check. State whether the statements are true or false. Correct if necessary.**

1. The initial version of MS-DOS included advanced features, including many taken from UNIX.

2. Steve Jobs invented the GUI (Graphical User Interface), completed with windows, icons, menus, and mouse.

3. Jobs' second project, called Lisa, was a huge success.

4. Lisa was user friendly, meaning that it was intended for users who not only knew nothing about computers but furthermore had absolutely no intention whatsoever of learning.

5. Windows NT was a complete rewrite from scratch internally.

6. Android is a Mobile OS which was based on the Linux Kernel and other Open Source software.

7. On October 22, 2009, Microsoft launched Windows NT internationally to the public.

8. Chrome OS is a free software which uses the Google Chrome web browser as it's a primary user interface (UI) and supports web applications.

### **III. Match the words having a similar meaning.**

1. To upgrade; 2. A wide selection of; 3. Crucial; 4. To coordinate; 5. To be prone to attacks; 6. Security; 7. Embedded; 8. Modern; 9. To navigate; 10. To install; 11. Compatible.

a. Vulnerable to viruses; b. A wide variety of; c. The latest; d. To route; e. To update; f. Consistent with another; g. Essential; h. To set up; i. Safety; j. To control; k. Built-in.

### **IV. Complete the sentences by giving the opposite form of the adjective in italics.**

*Example: Windows OS is more secure to use than Mac OS. –Windows OS is less secure to use than Mac OS.*

1. Torch browser is the least reliable to surf the Internet. 2. Apple platforms are cheaper than those of Windows. 3. Smartphones are sold at more affordable prices than 10 years ago. 4. Asus computers are far less playful, and less powerful than they used to be 3 years ago. 5. This software is the best I have ever used before. 6. Sony focuses on the worst, less coherent, the least usable features for its users.

### **V. Complete the gaps in this text on OS using these linking words and phrases.**

*Although, because, but, in addition, such as, therefore*

The user is aware of the effects of different application programs (1) ... operating systems are invisible to most users. They lie between application programs, (2) ... word processing, and the hardware. The supervisor program is the most important. It remains in memory, (3) ... it is referred to as resident. Others are called non-resident (4) ... they are loaded into memory only when needed. Operating systems manage computer resources, (5) ... the central processing unit. (6) ..., they establish a user interface, and execute and provide services for application software. (7) ... input and output operations are invoked by application programs, they are carried out by the operating system.

### **VI. Fill in the article and answer the questions.**

1. What is the difference between application software and OS?
2. Why is the supervisor program the most important OS program?
3. What is the difference between resident and non-resident programs?
4. What are the main functions of an operating systems?

### **Operating Systems: hidden software**



When ... brand new computer comes out off ... factory assembly line, it can do nothing. ... hardware needs software to make it work. Are we talking about applications software such as word processing or spreadsheet software? Partly. But ... applications software package does not communicate directly with the hardware. Between ... application software and ... hardware is ... software interface - ... operating system. ... operating system is ... set of programs that lies between applications software and ... computer hardware.

... most important program in ... operating system, ... program that manages ... operating system, is ... supervisor program, most of which remains in memory and is thus referred to as resident. ... supervisor controls ... entire operating system and loads into ... memory other operating system programs (called non-resident) from disk storage only as needed.

... operating system has three main functions:

1. manage ... computer's resources, such as ... central processing unit, memory, disk drives, and printers;
2. establish ... user interface;
3. execute and provide services for application software. Keep in ... mind, however, that much of ... operating system is hidden from ... user. In particular, ... first listed function, is taken care of without user being aware of ... details.

Furthermore, all input and output operations, although invoked by ... applications program, are actually carried out by ... operating system.

## **VI. Give the main points of the text B. Use the following clichés:**

*The text is about ... . In the next paragraph ... . The text elucidates ... . It should be noted, that ... . The text gives a good insight into ... . To conclude ... .*

## **Unit VIII. Computer Viruses**

### **VOCABULARY STUDY**

#### **Word List**

##### ***Nouns and noun phrases***

Vulnerability — уязвимость, незащищенность; partition table — таблица разбиения дисков; decline — уменьшение; removal — удаление; header — верхний колонтитул; footer — нижний колонтитул; Multipartite virus — комбинированный вирус; registry — реестр;

##### ***Adjectives and collocations***

malware program — вредоносная программа; self-replicating — самовоспроизводящийся; bootable — загрузочный; overall — итоговый; overwrite virus — вирус в режиме наложения записи; conventional — обычный; high-end software — профессиональное, высокопроизводительное ПО; unsolicited — нежелательный; non-replicating — не воспроизводящийся; legitimate — законный; remote access — удаленный доступ;

##### ***Verbs, Adverbs***

Intentionally — намеренно; trigger — запускать; inject — вводить; breach — находить брешь; propagate — распространять; embed — встраивать; robust — устойчивый к сбоям; shut down — завершать работу; inherently — внутренне.

**I. Match the words with the definitions below.**

*Malicious, malware, damage, identity, threat, to pretend, to scare, to spread, scam, to disguise, to replicate, to prevent, to encrypt, 14) firewall.*

1. physical harm that is done to an object
2. who you are, your name, date of birth, etc.
3. to cause great fear, frighten
4. to make something unrecognizable by changing its appearance
5. intended to do harm
6. an illegal trick with the purpose of getting money from people
7. malicious software
8. a computer system or program that automatically blocks an unauthorized access to a computer when it is connected to the Internet
9. to claim that something is true, when it is not
10. to convert data into a special code to prevent unauthorized access
11. a danger that something unpleasant might happen to people
12. to gradually reach a larger area or more people
13. to stop something from happening
14. to make an exact copy, reproduce

**II. Using a dictionary add as many words as possible into the table.**

<i><b>Verbs</b></i>	<i><b>Adjectives</b></i>	<i><b>Nouns</b></i>
1. to boot		
2.		partition
3. to infect		
4.	restored	
5.		location
6. to encrypt		
7.		extension

**III. Choose the words with similar meaning from the two groups and arrange them in pairs.**

A. Partition, root, overload, encryption, remote, malware, inject, web scripting.

B. Virus, access, a code, directory, program, table, key, the network.

**IV. Match the words with a similar meaning. Check any unknown words in a dictionary.**

1. To delete; 2. Malicious; 3. Charges; 4. To replicate; 5. Scam; 6. Identity; 7. Secure; 8. Damage;

a. Expenses, costs; b. To duplicate; c. Harm; d. To remove; e. Safe; f. Harmful; g. Fraud; h. Personal information.

**V. Match the words. Check that you know the meanings of the phrases. Then complete the sentences below.**

1) *commit*; 2) *unauthorized*; 3) *phishing*; 4) *antivirus*; 5) *security*; 6) *self-replicating*; 7) *built-in*; 8) *verify*;

a) *program* b) *firewalls* c) *access* d) *email* e) *information* f) *crimes* g) *software* h) *warning*.

1. Virus is a \_\_\_\_ that interferes with a computer's hardware or operating system. 2. Some computers come with security software. Windows 7 and Mac OS X already have \_\_\_\_\_. 3. \_\_\_\_ can protect you from infected email attachments, Internet worms, and fake websites. 4. Cybercriminals \_\_\_\_ by stealing people's money or their identity data. 5. \_\_\_\_ is disguised to look like official communications from a legitimate website. 6. Once installed, spyware programs can have \_\_\_\_ to user's activities – such as Internet surfing habits and browser activity. 7. If you \_\_\_\_ about your identity on a fake website, scammers can use these details to withdraw money from your bank account. 8. When you visit a malicious site your browser will display a red \_\_\_\_ message.

**VI. Translate the following sentences into English.**

1. Существует ряд Интернет угроз, с которыми мы можем столкнуться в сети: кража личных данных, шпионское программное обеспечение, фальшивые антивирусы и другие вредоносные программы. 2. Хорошее антивирусное программное обеспечение должно предлагать защиту в режиме реального времени. 3. – Что может заблокировать несанкционированный доступ к компьютеру из сети? 4. Однажды установив антивирусное программное обеспечение, вам необходимо обновлять его регулярно. 5. – Я не уверен, какой антивирус подойдет для моего компьютера. Что вы можете мне посоветовать? – Попробуйте загрузить бесплатную пробную версию вот этого программного обеспечения. Оно предоставляет защиту высокого уровня без замедления работы вашего устройства. 6. – Тебе бы лучше сделать резервные копии твоих файлов в сети, другими словами, в облаке. – Какая разница? – Когда ты хранишь информацию в облаке, она сохраняется на сервере в Интернете. Ты всегда можешь иметь доступ к своим файлам, даже если компьютер поврежден. 7. Вам не следует открывать почтовые приложения, полученные от незнакомых людей или нажимать на ссылку, содержащуюся в письме. Иначе вы можете стать жертвой кибермошенничества. 8. – Мне помочь тебе с программой по шифрованию? – Да, пожалуйста. Я не могу полностью разобраться в ней.

#### **A. TEXT STUDY**

**I. Read the text and answer the following questions.**

1. Why do most programs catch viruses?

2. What criteria can computer viruses be categorized according to?
3. Enlist the types of viruses and characterize them briefly.
4. What can each type of virus affect? Give examples.
5. What are the protection measures against each type of virus?
6. What are logic bombs?

### **TEXT A. Computer Viruses**

A computer virus is a malware program that is written intentionally to gain access to a computer without its owner's permission. These kinds of programs are primarily written to steal or destroy computer data. Most systems catch viruses due to program bugs, the vulnerability of operating systems, and poor security practices.

There are different types of computer viruses that can be categorized according to their origin, spreading capabilities, storage location, files they infect and destructive nature. Do you know the first-ever computer virus (named Creeper) was an experimental self-replicating program written by Bob Thomas at BBN Technologies in 1971?

1. *Boot Sector Virus.* Boot Sector virus infects the storage device's master boot record (MBR). Any media, whether it is bootable or not can trigger this virus. These viruses inject their code to hard disk's partition table. It then gets into the main memory once the computer restarts. Booting problems, unstable system performance and inability to locate hard disk are common issues that may arise after getting infected. However, it has become rare since the decline in floppy disks. Modern operating systems come with an inbuilt boot sector safeguard. The virus can affect any file after getting into the main memory. Examples: Form, Disk Killer, Stone virus, Polyboot.B. Protection: Make sure that the disk you are using is write-protected. Do not start/restart the computer with unknown external disks connected.

2. *Direct Action Virus.* This virus quickly gets into the main memory, infects all programs/files/folder defined in Autoexec.bat path and then deletes itself. It can also destroy the data present in hard disk or USB attached to the computer. While these viruses are found in hard disk's root directory, they are capable of changing location on every execution. In most cases, they don't delete system files but alter the system's overall performance. It can affect all .exe and .com file extension. Example: VCL.428, created by the Virus Construction Laboratory. Protection: Use antivirus scanner. Direct action virus is easy to detect and all infected files can be restored completely.

3. *Overwrite Virus.* Overwrite viruses are very dangerous. They have affected a wide range of operating system including Windows, DOS, Macintosh, and Linux. They simply delete the data (partially or completely) and replace the old code with their own. They replace the file content without changing its size. It is easy to detect as the original program stops working. Once the file gets infected, it can't be restored and you will end up losing all data. It can affect any file. Examples: Grog.377, Grog.202/456, Way, Loveletter. Protection: The only way to get rid of this virus is to delete all the infected files, so it's better to keep your antivirus program updated, especially if you are using Windows.

4. *Web Scripting Virus*. A web scripting virus breaches web browser security and allows attackers to inject client-side scripting into the web page. They propagate quite faster than other conventional viruses. It is used to attack large sites like social networking, user review or email. It has the potential to send a large amount of spam, fraud activity, and damage files on sever. It can affect any web page by injecting hidden code in header, footer or root access file. Examples: DDos, JS.fornight. Protection: Use malicious software removal tool in Windows, disable scripts, use cookie security or install real-time protection software for the web browser.

5. *Directory Virus*. Directory Virus (also known as Cluster virus) infects the file by changing the DOS directory information. In this case, DOS points to the virus code rather than pointing to the original program. When you run a program, DOS first loads and executes the virus code before running the actual program code. It becomes very difficult to locate the original file after getting infected. It can affect: The entire program in the directory. Example: Dir-2. Protection: Install the antivirus to relocate the misplaced files.

6. *Polymorphic Virus*. The polymorphic virus encodes themselves using different encryption keys and algorithms each time they infect a program or create a copy of itself. Because of different encryption keys, it becomes very difficult for the antivirus software to find them. In other words, it is a self-encrypted virus which is designed to avoid detection by scanners. It can affect any file. Examples: Whale, Simile, SMEG engine, 1260. Protection: Install advanced, high-end antivirus software.

7. *Memory Resident Virus*. These viruses live in primary memory (RAM) and get activated whenever you switch on the computer. They affect all files currently running on the desktop. Basically, it allocates memory, blocks original scripts, and runs its own code when any program is executed. It can affect any file running on PC and files that are being copied or renamed. Examples: Randex, Meve, CMJ. Protection: Install strong antivirus software.

8. *Macro Virus*. There are a few software such as a word processor that allows a macro program to embed in documents. This virus is written in the macro language, so it may run automatically when the document is opened and it can easily spread to other files too. It depends on the application rather than the operating system. They are generally hidden in documents that are more likely shared via email. It can affect: .mdb, .PPS, .Doc, .XLs files. Examples: Bablas, Concept and Melissa virus. Protection: Disable macros and don't open emails from unknown sources. Alternatively, you can install modern antivirus software that can detect macro virus easily.

9. *Companion Virus*. Companion Viruses were more popular during the MS-DOS era. Unlike traditional viruses, they do not modify the existing file. It creates a copy of a file with a different extension (usually .com) which runs in parallel with the actual program. For example, if there is a file named abc.exe, this virus will create another hidden file named abc.com. And when the system calls a file 'abc', the .com (higher priority extension) runs before the .exe extension. It can perform malicious steps such as deleting the original files. Can affect: All .exe files.

Examples: Stator, Terrax.1096. Protection: Can be easily detected because of the presence of additional .com file. Install reliable antivirus software and avoid downloading attachments of unsolicited emails.

*10. Multipartite virus.* The Multipartite virus infects and spreads in multiple ways depending on the operating system. They usually stay in memory and infect the hard disk. Once it gets into the system, it infects all drives by altering applications' content. You will soon start noticing performance lag and low virtual memory available for user applications. It can affect: Files and boot sector. Examples: Ghostball, Invader. Protection: Clean boot sector and entire disk before reloading the data. Do not open attachments from a non-trusted internet source and install quality antivirus software.

*11. FAT Virus.* FAT stands for file allocation table which is a section of storage disk that is used to store information, such as the location of all files, total storage capacity, available space, used space etc. A FAT virus alters the index and makes it impossible for the computer to allocate the file. It is powerful enough to force you to format the whole disk. It can affect any file. Example: The link virus. Protection: Avoid downloading files from non-trusted sources, especially those identified as "attack site" by browser or search engine. Use robust antivirus software. Other malware that are not Virus but are equally dangerous.

*12. Trojan Horse.* Trojan Horse (or Trojan) is a non-replicating type of malware that looks legitimate. Users are typically tricked into loading and executing it on the system. It can destroy/modify all the files, crash the computer, modify the registry, and is strong enough to give hackers remote access to your PC. Examples: ProRat, ZeroAccess, Beast, Netbus, Zeus. Protection: Use reliable high-end antivirus software and update it regularly.

*13. Computer worms.* Worm is a standalone malware program that replicates itself in order to spread to other computers. It relies on networks (mostly emails) and security holes to travel from one system to another. Unlike viruses, it overloads the network by replicating or sending too much data, forcing the hosts to shut down the server. Example: Code red, ILOVEYOU, Morris, Nimda, Sober, WANK. Protection: Use antivirus and anti-spyware software.

**Logic Bombs.** They are not a virus but inherently malicious like worms and viruses. It is a piece of code intentionally inserted (hidden) into a software tool. This code is executed after certain criteria are met.

## **II. Comprehension Check. State whether the statements are true or false. Correct if necessary.**

1. A malware program is written intentionally to steal money from bank account without its owner's permission.
2. Booting problems have become rare since the decline in floppy disks.
3. In most cases, boot sector viruses don't delete system files but alter the system's overall performance.
4. Once the file gets infected by overwrite viruses, it can't be restored and you will end up losing all data.

5. Logic Bombs are used to attack large sites like social networking, user review or email.

6. When you run a program, DOS first loads and executes the virus code before running the actual program code.

7. Memory resident virus is a self-encrypted virus which is designed to avoid detection by scanners.

8. Companion viruses are generally hidden in documents that are more likely shared via email.

9. Companion viruses can be easily detected because of the presence of additional .com file.

10. FAT virus stays in memory and infect the hard disk.

11. Trojan Horse can destroy/modify all the files, crash the computer, modify the registry, and is strong enough to give hackers remote access to your PC.

### **III. Do a brief quiz below to test your knowledge about Internet Security.**

#### **Internet Security Quiz**

1. Viruses, worms, and Trojans are all examples of \_\_\_\_.
  - a) pets that can be seen in a zoo;
  - b) phishing;
  - c) malware;
  - d) scareware.
2. What is malware?
  - a) hardware that controls a computer without the user's knowledge;
  - b) faulty software;
  - c) hardware that detects and removes viruses from a computer;
  - d) software created to cause harm to a computer system or data.
3. What is a virus?
  - a) a program that makes user feel unwell;
  - b) a program which replicates itself and spreads to other computers via attachments;
  - c) a program that monitors user's activities;
  - d) a program that stops a computer from working.
4. Malware can be downloaded through \_\_\_\_.
  - a) spam emails;
  - b) infected computers;
  - c) unsafe websites;
  - d) all of the above.
5. What is spyware?
  - a) malware that harms your computer by deleting or altering files and stopping programs from running;
  - b) malware that tricks you into thinking it is software you need to buy;
  - c) malware that collects information from a computer and sends it to cybercriminals;

- d) malware that pretends to be a trusted file.
- 6. What is the purpose of phishing?
  - a) controlling computer without user's knowledge;
  - b) sending a program that replicates itself and spreads to other computers via attachments;
  - c) sending a malicious link disguised as a security warning;
  - d) sending an email that is designed to trick the user into giving away personal information.
- 7. What should be used to remove malware from a computer?
  - a) a filter;
  - b) antivirus software;
  - c) encryption;
  - d) a firewall.
- 8. How can one safeguard against phishing?
  - a) Install a firewall.
  - b) Don't believe everything you read on the Net.
  - c) Make backup copies of your files regularly.
  - d) Don't follow a link from the email you don't trust.
- 9. What is the purpose of a firewall?
  - a) to detect viruses on a system and prevent them from attacking it and spreading;
  - b) to prevent unauthorized connections coming into and out of a network;
  - c) to prevent from illegal copying and distribution of copyrighted software, information, music, etc.;
  - d) to prevent a hacker from logging on to the computer.
- 10. Which of the following is a simple way to stay safe online?
  - a) Don't open email attachments from unknown people.
  - b) Run and update antivirus programs.
  - c) Don't give out personal information.
  - d) All of the above.

#### **IV. Rephrase the sentences using modal verbs.**

*Example: It's a good idea to back up the files. You'd better back up the files.*

1. I advise you to transfer files via a secure connection. 2. Do not download unknown files. 3. Students are obliged to be on time for all their classes. 4. It isn't a good thing to open email attachments from people you don't know. 5. I advise you to turn on a firewall. 6. You don't need to contact technical support. Jim has already called them. 7. It's necessary to use mail encryption to send sensitive data. 8. It is the best thing to keep your antivirus software updated. 9. It's a good idea to set user access levels on your laptop. 10. You are not allowed to make any changes to the system. 11. Don't use a public Wi-Fi for shopping and banking. 12. It's necessary for you to create a strong password to stop criminals from accessing your private information.



## **V. Correct the mistakes.**

1. I have e-mail some urgent letters. 2. You can't to access the network. 3. You don't must be late for the exam. 4. Sasha can't remove malware from his computer yesterday. 5. Do I could use your laptop?

### ***B. TEXT STUDY***

#### **I. Read the text and answer the following questions.**

1. Prove that Google Chrome is the most popular web browser in the world.
2. Why do you need to clear your cache?
3. What are extensions used for?
4. What are malware and adware extensions?
5. What way does a top-performing web browser benefit business?

## **How to Make Google Chrome Superfast**

Google Chrome is the most popular web browser in the world with over 2 billion installs, 1 billion users, and 53% share of the market. Its speed is one of its most notable advantages over other existing browsers, as well as one of the reasons why it's preferred by most netizens. But even the fastest browser experiences some performance drops from time to time. If your Chrome has slowed down, here are simple hacks to get it back into tip-top shape in no time.

*Clear your browsing data.* Chrome stores a cached copy of a website you visit, so it can load the page faster when you visit it again. It also keeps a database of your browsing history and cookies for the same purpose. As you visit more and more websites, these pieces of data accumulate in Chrome and can slow the browser down.

Thankfully, the solution to this is easy: clear your cache. To do this, simply access your browsing history by entering `chrome://history` on your address bar. From the left panel, select Clear browsing data. Choose which data will be deleted by clicking on the checkboxes of all items you want to delete, like cached images or cookies. You can also select the time range that will be affected by the deletion. You can delete your history for the past hour, the last 24 hours, the last 7 days, the last 4 weeks, or from the beginning of time. Once you've selected the files you want to delete and their corresponding time range, click Clear data.

*Disable extensions.* Extensions are downloadable programs from the Chrome Web Store that you can add to your browser to give it more functionality and a personalized touch. For example, you can add an extension that blocks ads, one that shortens URLs, or one that shows you your most important tasks of the day. While these extensions are useful, they can slow Chrome down when there are too many installed at once.

Most extensions will show on Chrome's address bar, and you can quickly uninstall them by right-clicking on their icons and selecting Remove from Chrome. You can also manage all extensions by typing `chrome://extensions` on your browser and hitting Enter. From there, you'll find a list of all the extensions you have (even

those you don't remember installing). Simply scroll through the list and click Remove to delete the extensions you don't need.

*Remove ads and malware.* Sometimes, Chrome slows down because of malware or adware extensions. Extra toolbars, recurring pop-up ads, and web pages redirecting to other addresses are clear indications of these. Google once had a downloadable app developed for Chrome that scans and removes unwanted programs called the Clean Up Tool. In 2018, Google discontinued that app and made malware scanning even easier. Just go to <chrome://settings/cleanup> on your browser, and click on Find to find and remove harmful software on your computer.

A top-performing web browser benefits your business in many ways, including upping employees' productivity and speeding up communication processes. It's therefore critical that yours is fast and reliable. If your web browser is performing poorly or takes forever to load a page, don't hesitate to get in touch with us so we can identify and fix the problem right away.

## **II. Comprehension Check. State whether the statements are true or false. Correct if necessary.**

1. Google Chrome performance is one of its most notable advantages over other existing browsers.
2. As you visit more and more websites, these pieces of data accumulate in Chrome and can accelerate the browser up.
3. Once you've selected the files you can restore the information easily.
4. Extensions are reloadable programs from the Chrome Web Store.
5. Most extensions will show on Chrome's address bar.
6. One can quickly install extensions by right-clicking on their icons and selecting Update from Chrome.
7. Chrome may slow down because of malware or adware extensions.
8. If your web browser is performing poorly, ask your provider for help.

## **III. Fill in many / much, a lot of / lots of / few / little / a few / a little. Sometimes more than one option is suitable.**

1. There are \_\_\_ various operating systems for you to choose from.
2. There were not \_\_\_ convenient means of communication 20 years ago.
3. Is there \_\_\_ difference between HDMI cables and HDMI Ethernet switch?
4. There are only \_\_\_ applications supported by this OS.
5. There is very \_\_\_ battery charge left. Bring up the charge adapter please.
6. You had better install a good anti-virus system because there \_\_\_ phishing attacks on the Internet now.
7. There is too \_\_\_ free space on my memory stick to copy this software. I need to use a different one.
8. There were quite \_\_\_ adequate ideas in his speech regarding our project.
9. There used to be very \_\_\_ service at this company and it was very bad.
10. There are \_\_\_ useful laboratories equipped with cutting-edge computing machines at the BSTU.

11. There were \_\_\_\_ good gadgets in the shop, that quite \_\_\_\_ customers wanted to buy.

**IV. Fill in some, any, no and their compounds in the sentences. Sometimes more than one option is suitable.**

1. There is \_\_\_\_ important about our research I must tell you.
2. There is \_\_\_\_ need to reinstall Windows, as it has a high performance.
3. Do you know if \_\_\_\_ attends courses on programming?
4. \_\_\_\_ special was added to a new version of this smartphone.
5. Are there \_\_\_\_ commentaries on this application usage?
6. Can you provide users with \_\_\_\_ more Internet security?
7. All people will benefit from \_\_\_\_ you do at your job.
8. You can use \_\_\_\_ authorized version of Windows, they are all quite reliable.
9. There is \_\_\_\_ wrong with the operating system of this computer. You must repair it immediately.
10. There are not \_\_\_\_ chances for \_\_\_\_ hackers' attacks with this antivirus system.
11. Can you give us \_\_\_\_ more time to finish our presentation?

**V. Put the verbs in brackets in the correct (Active or Passive) form using the Present Simple or Future Simple Tense.**

Google Spreadsheet (be) a free web best application similar to Microsoft itself. You (create) and (edit) spreadsheets for all kinds of projects including contact lists. To get started, the create button (click) and a spreadsheet (choose). First, we (have) a toolbar, where different shortcuts (access). The print command, undo and redo options (include) as well as the self-format and font size (control) by the user. To view even more options the menus above the toolbar (use). Thus, you (give) access to many additional features. You (navigate) back to Google drive to title up you spreadsheet so that it is easier to find a file again in the future. There (be) no save button, because Google spreadsheet (use) the auto save feature, which automatically (save) your file any time you (make) a change. Finally, you (find) a comments button and a share button. You (allow) to collaborate with other Google Drive users and you quickly (manage) your sharing options. Each spreadsheet (consist) of cells, columns and rows for your data. A cell (be) the interaction of a row and a column. There (be) also the formula bar where text, formulas and functions for a specific cell (enter). At the very bottom of the window additional sheets (add) to your spreadsheet by clicking a plus button.

**VI. Speak about computer viruses and internet security measures using key words, phrases and the topic sentences.**