MODULE I

UNIT 1. COMPUTERS AND DIGITAL BASICS

READING

Read the questions and find the answers in the text.

1. How does digital technology affect society?
2. What are the four phases of the digital revolution?
3. What's the difference between an operating system and application software?

TEXT A: COMPUTER CONCEPTS

At present we live in the information age. It is a period of history when information is easy to access and it affects many aspects of everyday life. The importance of information is not new. It has always been a powerful tool. The information age is unique because of its underlying technology based on digital electronics. The **digital revolution** offers advantages, but requires adaptations. Digital innovations require societies to **make adjustments** to traditions, lifestyles and legislation. Digitization is the process of converting text, numbers, sounds, photos and video into data that can be processed by digital devices. The significant advantage of digitization is that things as diverse as books, movies, songs, conversations, documents, and photos can all be distilled down to a common set of signals that do not require separate devices. Data processing is based on an input-processing-output cycle which is often referred to as the IPOS cycle.

The digital era has evolved through four phases, beginning with big, expensive computers and progressing to modern digital world in which small inexpensive digital devices are everywhere. **Data processing** is the computing model for the first phase of the digital revolution. In the first phase computers were huge, complex and expensive devices. They existed in limited numbers, primarily housed in big corporations and government agencies. Computers and data processing became **crucial tools** for effective business operations. The second stage was presented by personal computing which is characterized by small, standalone computers powered by local software. Local software refers to any software that is installed on a computer's **hard disk**. The third phase of the digital revolution materialized as computers became networked and when the Internet was opened to public use. A **computer network** is a group of computers linked together to share data and resources. The Internet is a global computer network originally developed as a military project, and was then handed over to the National Science Foundation for research and academic use. The Web (short for World Wide Web) is a collection of linked documents, graphics, and sounds that can be accessed over the Internet. A key aspect of the Web is that it adds content and substance to the Internet. From 1996 – 2010 computing was characterized by the Web, e-mail, multiplayer games, music downloads and enormous software applications. Then Facebook, Twitter and Google Apps have sent computing in

new directions. Cloud computing characterizes the fourth phase of the digital revolution. Cloud computing provides access to information, applications, communications and storage over the Internet. Before cloud computing most computers ran software based locally. With cloud computing all that changes. You can store your data in the cloud, making it available no matter what computer you use. Using a cell phone service provider your mobile device accesses the Internet. The touch screen on your mobile gives you access to apps that play music, show movies, report news. You use Google or Wikipedia to access information and when you need to produce a document, you head over to Google to access its cloud-based word processor. You spend lots of time maintaining your profiles on social networking services and interacting with friends through cloud-based social media.

Computers do so many things and come in such a variety of shapes and sizes that it might seem difficult to distil their common characteristics into an all-purpose definition. A computer is a **multipurpose device** that accepts **input**, processes data, stores data, and produces **output**, all according to a series of stored instructions. Computer input is whatever is typed, submitted or transmitted to a computer system. An input device gathers data and transforms it into electronic signals for the computer to store and manipulate. Output is the result produced by a computer. Some examples of computer output include reports, documents, music, graphs and pictures. Output devices display, print, or transmit the results of processing. Computers manipulate data in many ways, and this manipulation is called **processing**. In a computer most processing takes place in a component called the **central processing unit** or **CPU**. The CPU of most modern computers is a microprocessor, which is an electronic component that can be programmed to perform tasks based on data it receives. A computer stores data so that it will be available for processing. **Memory** is an area of a computer that temporarily holds data waiting to be processed, stored, or output. **Storage** is the area where data can be left on a permanent basis when it is not immediately needed for processing. Data is typically stored in files. A computer file is a named collection of data that exists on a storage medium. The series of instructions that tells a computer how to carry out processing tasks is referred to as a computer program or simply a program. These programs form the **software** that sets up a computer to do a specific task.

Computers run two main types of software: **application software** and **system software**. A computer can be applied to many tasks, such as writing, number crunching, video editing, and online shopping. Application software is a set of computer programs that helps carry out a task. **Word processing software**, for example, helps people edit and print documents. Software application is sometimes referred to as apps, especially in the context of handheld devices. Whereas application software is designed to help a person carry out a task, the primary purpose of system software is to help the computer system monitor itself in order to function efficiently. An example of system software is a computer **operating system** (**OS**), which is essentially the master controller for all the activities that take place within a computer.

At one time there were three distinct categories of computers: mainframes, minicomputers and microcomputers. Now commonly used computer categories include personal computers, servers, mainframes and supercomputers. A **personal computer** is a microprocessor-based computing device designed to meet the computing needs of an individual. It provides access to a wide variety of local and cloud-based applications. In the computer industry, the term **server** has several meanings. It can refer to computer hardware, to a specific type of software, or to a combination of hardware and software. In any case, the purpose of a server is to serve computers on a network by supplying them with data. A **mainframe** computer is a large and expensive computer capable of simultaneously processing data for hundreds or thousands of users. Mainframes are generally used by businesses or governments to provide centralized storage, processing and management for large amounts of data. Mainframes remain the computer of choice in situations where reliability, data security and centralized control are necessary. A computer falls into the **supercomputer** category if it is one of the fastest computers in the world. Because of the speed, supercomputers can tackle complex tasks and compute-intensive problems that just would not be practical for other computers. Handheld digital devices include familiar gadgets such as iPhones, iPads, iPods, Garmin GPSs, Droids and Kindles. These devices incorporate many computer characteristics.They accept input, produce output, process data and include storage capabilities. Handheld devices vary in their programmability and their versatility.

COMPREHENSION

According to the text, are the following sentences TRUE or FALSE? Say why?

1. A computer network is a group of computers linked together to share data and resources.
2. Cloud computing characterized the third phase of digital revolution.
3. You can’t interact with your friends through cloud-based social media.
4. Computer input is submitted or transmitted to a computer system.
5. Processing is data manipulation in many ways.
6. Application software is a set of computer programs that helps carry out a task.
7. Computers run two main types of software: application software and system software.
8. The term server refers only to computer hardware.

QUICK CHECK

Fill in the gaps in the text to best complete each sentence.

The **digital revolution** is an ongoing process of social, political, and economic change brought about by technologies such as computers and networks. The **Intranet** is a global computer network originally developed as a **military project**, adapted for research and academic use, and only then for commercial use. **Technology-driven society** has an effect on the economy, as consumers gain

access to products and services from countries other than their own. Activists worry about the **digital divide** that separates people who have access to technology and those who do not. Digital technologies and **communications networks** make it easy to cross cultural and geographic boundaries. News, television shows, music, and art from all over the globe are accessible on the Internet. The Internet has the potential to expand **freedom of speech** by offering every person on the planet a forum for personal expression using personal Web sites, blogs, chat groups, social media. **Intellectual property** refers to the ownership of certain types of information, ideas, or representations. Digital technology has made it easy to produce copies with no loss in quality from the original.

DISCUSSION

Work in groups. Discuss the following questions.

1. What are the four phases of the digital revolution?
2. How does digital technology affect society?
3. Why are the Web and the Internet not the same?
4. How do computers work with input, output, processing, storage, and stored programs?
5. What's the difference between an operating system and application software?
6. Do you know the difference between the apps you use and your computer's operating system?
7. How do personal computers differ from servers, mainframes and supercomputers?
8. Are portable media players and mobile phones classified as computers?

WRITING

Write a short summary of the text using the following concept map in relation to computer basics.