Military Technological College

FPD COMPUTING

WORKBOOK-I[CA1]   MODULE CODE: MTCG1015

Term – 1	AY: 2024-25	COMPUTING

MILITARY TECHNOLOGICAL COLLEGE
Delivery Plan - Year 2024-25 [Term 1]

Title / Module Code / Programme	Computing /MTCG1015/FPD	Module Coordinator	Ms. Rehana Anjum
Lecturers	TBA	Resources & Reference books	Moodle & Workbook
Duration & Contact Hours	Term 1: 5 hrs x 11 weeks = 55 hours		

WEEK No	Chapter	TOPICS	Hours	L O No
1	1	What is a Computer, Data, Information	5	1
		Basic Applications, Basic functional Blocks of Computer, Work of each Block		
		Computer Components, Essential Computer Hardware,		
		Input Unit, Storage Devices, Unit of data measurements, Primary storage devices		
		Secondary storage devices, CPU		
2	1	Output Unit, Motherboard, PSU, Ports	5	1
		Different types of computers		
		Software, System software, Application software, Programming languages and software		
		Software copyright, Omani data protection legislation, Install and uninstall software applications		
		Minimum laptop computer configurations for students, Computer Ergonomics		
3	2	Switching On the computer, Getting started with Windows 10, Working with files,	3	2
		Adjusting Computer settings, shutting down the computer, other ways to exit the computer properly, Ribbons, menus, and toolbars, File management. [CA1 until this topic]		
		File Explorer, Working with files and Folders, Components of File explorer		
		Malware		
	1&2	Revision for CA1	1	1 & 2

	1&2	CA1 (20%) [Chapter 1] and [Chapter 2 until file management]	1	1 & 2
4	2	Password, Backing up of data	5	2
		Compress and Decompress Files and Folders, Formatting Storage Media, Built in help		
	3	Computer Networks, IP Address, Data transfer rate, LAN, WAN, MAN		3
		Advantages/Disadvantages of Using a Network, Intranet, Extranet, Internet, Brief history of Internet, Internet devices, Dial-Up, Broadband		
		WWW (World Wide Web), Web Browsers, Web servers		
5	3	URL, Domain, Using web, Search Engine	5	3
		Electronic mail, E-mail address structure, Parts of an E-mail message		
		Microsoft Outlook functionalities, How E-mail works		
		Moodle and Outlook, Conferencing,		
		VoIP, Instant messaging, Blogs, Things to be cautious about on the Internet, Risks to personal and organizational data		
6	3	How to protect data, Techniques to improve data security, Effects of IT on our lives and on Society [CA2 until this topic]	1	3
		Moodle file upload/download exercise		4
		Microsoft Setting Exercise, MS Word Exercise 4.1	1	
	2&3	Revision for CA2	1	2&3
	2&3	CA2 (30%) [Chapter 2 and Chapter 3]	2	2&3
7	4	MS Word Exercise 4.1 (Cont.)	5	4
		MS Word Exercise 4.2		
		MS Word Exercise 4.3		
		MS Word Exercise 4.4		
8	4	MS Word Exercise 4.5	5	4
		MS Word Exercise 4.6		
		MS Word Exercise 4.7		6
9	5	MS Word Exercise 4.8	5	6
		MS Excel Exercise 4.9		
		MS Excel Exercise 5.1		

		MS Excel Exercise 5.2		
10	5 & 6	MS Excel Exercise 5.3	5	6
		MS Excel Exercise 5.4		
		MS Excel Exercise 5.6		
		MS Excel Exercise 5.10		
		MS PowerPoint Exercise 6.1		5
11	6	MS PowerPoint Exercise 6.2	5	5
		MS PowerPoint Exercise 6.3		
		MS PowerPoint Exercise 6.4		
		MS PowerPoint Exercise 6.7		
	4, 5 & 6	FINAL EXAM (50%) [Chapter 4, Chapter 5, and Chapter 6]	90 min	4, 5 & 6
		TOTAL Teaching hours	55hrs	

Indicative Reading	
Title/Edition/Author	ISBN
BASIC COMPUTER COURSE MADE SIMPLE (3rd Ed, 2016), Author: Satish Jain Publisher: Bpb Publications	ISBN – 13: 9788183334594 ISBN – 10: 8183334598
Computing Essentials 2021 Author: Timothy J. O'Leary, Daniel O'Leary, Linda I. O'Leary Publisher: Mc Graw-Hill	ISBN – 978-1-259-92127-8
MICROSOFT OFFICE INSIDE OUT: 2021 (Microsoft 365) EDITION Author: Microsoft Corporation, Ed Bott and Carl Siechert Publisher: Sebastopol, CA: O'Reilly Media, Inc., 2013	ISBN – 9780735677562
WINDOWS 11 FOR DUMMIES Author: Andy Rathbone Publisher: Hoboken, NJ: Wiley, 2021	ISBN – 9781118134610
Fundamentals of Computer Science (1st Edition August 2023), Author: Dr. Mahalingam Palaniandi and Dr. R. Selvam Publisher: VR1 Publications	ISBN : 978-93-91332-78-5

Ms. Rehana Anjum **Module Coordinator**	**Dr. T. Raja Rani** **Deputy Head of FPD (C/M/P)**	**MQM/Salim Al Shibli** **Head of FPD**

Table of Content:

Assessment Plan (Passing Mark 50%)

Assessment	Mark
CA1	20%
CA2	30%
Final	50%
Total	100%

Attendance Policy

1. First warning: 10%
2. Second warning: 15%
3. Third warning: 20%

Chapter1: Computer fundamentals

Computer:
A computer is an electronic device which works with information. It has the ability to store, retrieve, and process data.

Examples: Desktop Computers, Notebooks or Laptop computers, Tablet PCs, Servers, Hand-held or Mobile computers, Music or media players, electronic book readers etc.,

Data:
Data are the collection of facts, numbers, letters, images and measurements that are not processed in any mean.
To have an idea of data, examine the following example very carefully.
Example: Ali, 95, 85, Mohammed, 75, 80, Said, 60, 55, Hassan, 70, 78.

Information:
Information is systematically processed data that gives a comprehensive meaning to the recipient. Information helps us making decisions or arriving at conclusions easily. However, to make decisions easily we have to organize data into information. Many efforts have to be taken when making decisions with unorganized data.
In the above example the names of a few pupils of a school and the marks they obtained for two subjects were shown.

Name	IT Marks	Physics Marks
Ali	95	85
Mohammed	75	80
Said	60	55
Hassan	70	78

Marks obtained for two subjects by pupils

By looking at the above table you will be able to see that it has more information available than the data given in the earlier example.
Example: Timetable, Report card, Pay slips, Receipts, etc.,

Answer the following questions:

1. Which of the following BEST describes a computer?

    a. It is a device

    b. It has the ability to process food quickly

    c. It is an electronic device which processes data

2. Which of the following sets is an example of computers?

    a. Mobile computers and computer table

    b. Laptop and media players

    c. Desktop computers and rice cooker

3. What information can we get from the data below?

Kilograms, Ibrahim, eyes, 53, weight, brown

    a. The black eye of Ibrahim has a weight of 53 kilograms

    b. The weight of Ibrahim is 53 kilograms, and he has brown eyes

    c. 53 kilograms is equivalent to the weight of Ibrahim

Basic Applications (Uses) of Computers:

1) Word processing, Video and Photo editing.
2) Internet
3) Banking applications (Automatic Teller Machines ATMs, Online Banking, Mobile Banking)
4) Defense (Handling of missiles, UAV, Simulators for military training)
5) Medical (CT scanners, MRI scanners, ECG, EEG machines)
6) Planning and scheduling (Calendar)
7) Education (E-Learning)
8) Telecommunication (Mobile networks)
9) Robotics
10) Computer Games
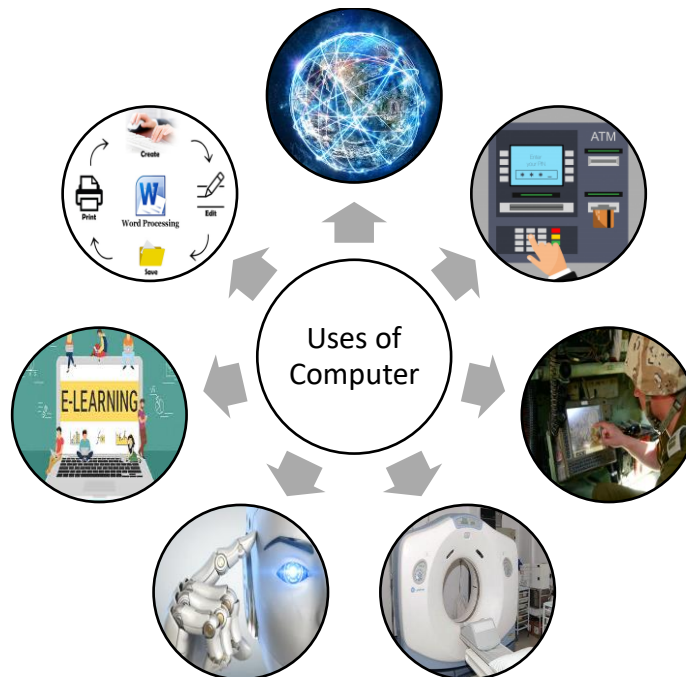
Answer the following questions:

1. Mr. Ahmed is a bank manager. He needs to discuss the bank's performance for the entire year. What type of computer applications should he use?
   a. CT scanner, ATM, and Computer games
   b. Robots, CAD software, and ECG machines
   c. Word processing, Internet, Planning and scheduling apps

2. Which of the following sets shows the Application of computers in medical field?
   a. ATM, CT scanner, Printer
   b. Robots, CDM, Game console
   c. CT scanner, EEG Machines, Desktop Computer

Basic functional blocks of computers:
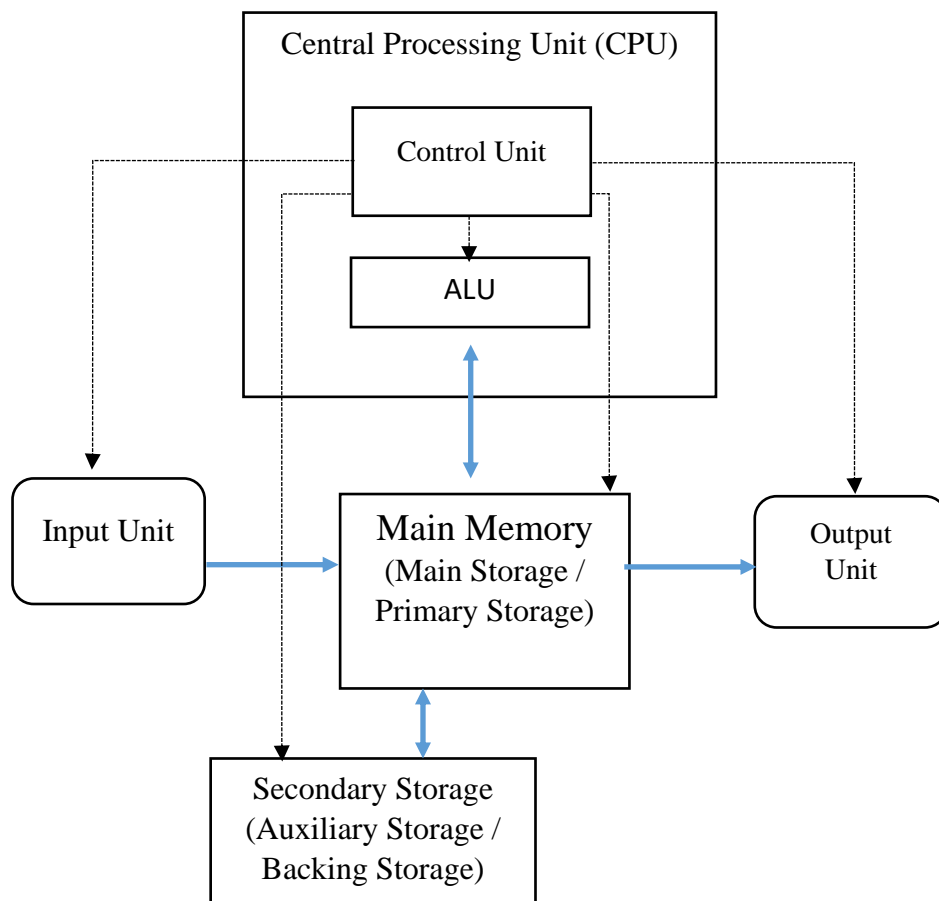
Answer the following questions:

1. How does a computer work?

   a. Processing→ input→Output

   b. Input→ Processing→ Output

   c. Output→ Processing→ Input

2. CU and ALU are jointly known as ………………….

   a. Primary Memory

   b. CPU

   c. Secondary storage

Work of each block:

Mainly there are four functional blocks available in any computer. They are an input unit, storage, central processing unit and output unit. Each unit has its own functions. All the units work together under the coordination of the CPU to process data.
The raw data entered into the computer through the input unit is stored in the storage unit. CPU uses the data available in the storage unit and converts them into useful information with the support of a program which will be discussed in the latter part of this chapter. Finally, the processed data (information) are displayed to the computer user through the output unit or will be saved in the storage for future use.

Each unit in the block diagram is being replaced with computer hardware devices to form the computers that you see nowadays.

Computer components:
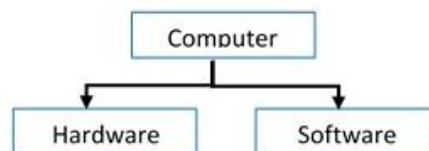
Computer Hardware:

Computer hardware is the collection of physical parts of a computer system. This includes the computer case, monitor, keyboard, and mouse. It also includes all the parts inside the computer case, such as the hard disk drive, motherboard, video card, and many others. In brief, computer hardware is what you can physically touch in the computer.

Answer the following question:

1. Physical components of the computer are called ………………….

   a. hardware

   b. firmware

   c. software

Essential Computer Hardware:
- Input devices
- Storage devices
- Processor
- Output devices
- Motherboard
- Power supply unit

5

Input Unit:
This is where the entering of data into the computer is done. Examples of input devices: keyboard, mouse, scanner, microphone etc.


#	Device image	Name
1		Webcam
2		Motion Controller
3		Credit card Reader
4		Fingerprint Scanner
5		Joystick
6		Game Controller
7		Barcode Reader

Input devices can be classified into a set of groups by considering the type of data it could handle as follows.

- Input devices for texts (Keyboard)
- Input devices for graphics (Scanner)
- Input devices for audio (Microphone)
- Input devices for video (Webcam)
- Pointing devices (Mouse, Trackball, Touchpad, Joystick)

Almost all the computers feature two input devices, a keyboard for typing and mouse or other pointing device for moving a cursor across the monitor screen.

The keyboard that we use is called the **QWERTY** keyboard. Most of the English-speaking countries use this keyboard layout. The QWERTY name comes from the first six letters on the top alphabetic row of the keys.
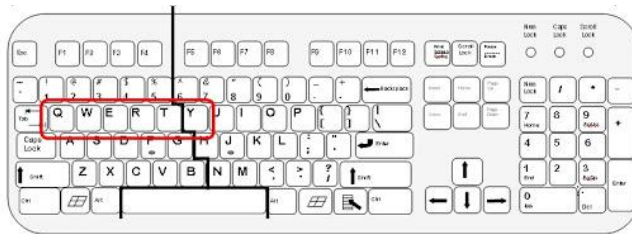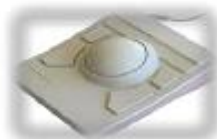

Mice and other pointing devices such as trackballs, touch pads, and touch screens let you move a cursor around the screen and click things.

Optical Mouse

Analog Mouse

Track Ball

Touch Screen

Answer the following questions:

1. Which of these can be used to input printed documents?

   a. Keyboard

   b. Mouse

   c. Scanner

2. We can input text using …………………

    a. Microphone

    b. Keyboard

    c. Webcam

3. Identify the picture given below:

    a. Trackball

    b. Mouse

    c. Joystick

Storage Devices:

Storage devices are used to store data and information in the computer. These devises maintain computer memory. Memory is measured in bytes.

Units of data measurements:

Unit	Value
Bit	1 bit
Nibble	4 bits
Byte	8 bits
Kilobyte	1024 bytes
Megabyte	1024 Kilobytes
Gigabyte	1024 Megabyte
Terabyte	1024 Gigabyte

Primary storage and secondary storage are the two types of storages.

Primary storage:

Primary storage is also called as main memory. These devices are manufactured using semiconductors.

The computer processor can manipulate only data available in the main memory. The main task of primary storage is to store data and provide them to the central processing unit for processing. Main memory is directly (quickly) accessible by the CPU.

RAM and ROM are examples of primary storages.

RAM	ROM
Random Access Memory	Read Only Memory
Stores data during and after processing called as temporary memory.	Memory permanently stored in the computer.
RAM is volatile. It only maintains its data while the device is powered.	ROM is non-volatile. It holds the saved data even if the power is turned off.

Secondary storage:

Another alternative storage to save your work. The basic task of the secondary memory is to store data, instructions or information needed for further use. Magnetic technology, optical technology and solid state are the three common storage technologies.

Magnetic storage:

It encodes data in patterns of positive and negative magnetic polarity on some magnetic medium. Floppy disks, hard disks and magnetic tapes are the examples of magnetic storages/mediums.

Hard Disk Drive (HDD):

Modern HDD capacities range from 500 GB to 10TB, but you may see older systems with smaller disks.

Optical storage:

Optical discs store data in reflective patterns on a shiny surface. They use a laser beam to read/write data on the discs. CDs, DVDs and BDs (Blu-ray) are examples. They use a laser beam to read/write data on the discs.

CD (Compact disc): The disc capacity is 700 MB.

DVD (Digital versatile disc): It has more capacity compared to CDs and can be single-layer or double-layer. Disc capacity can be 4.7 GB to 8.5 GB.

BD (Blu-ray disc): It has more capacity compared to CDs and DVDs and multiple layers (three or four layers in some versions). Disc capacity can be 25 GB to 125 GB.

Solid-State storage:
Instead of disks (or discs), solid-state storage uses nonvolatile (flash) memory that can retain data when powered down. This technology has no moving parts. This is more expensive per GB than disk-based storages, but it is also lighter, faster, silent and more efficient.

*Examples:* USB Flash drive, Flash memory cards (Secure Digital (SD), MicroSD), Solid-State Drives (SSDs).

> When CPU needs some data, the data is brought from secondary storage devices to main memory and CPU.

Answer the following questions:

1. Which of the following is true:

   a. CD can hold only video files

   b. DVD can hold only audio files

   c. DVD has more space than CD

2. Floppy disk is an example of:

   a. Optical medium storage device

   b. Magnetic medium storage device

   c. Flash memory

3. ……………….. is the main memory of computer.

   a. Primary storage

   b. Secondary storage

   c. Flash memory

Processor (CPU):
The Processor is like the brain of the computer. This is the place where actual processing takes place. Processor converts raw data into useful information. This task is called processing.
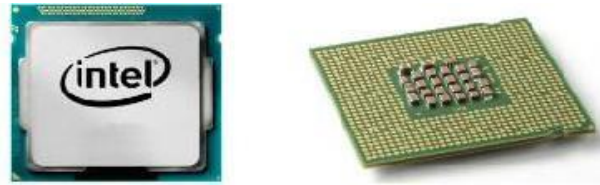
A CPU chips

As you can see in the block diagram in page 1, the CPU consists of two main parts namely Control Unit (CU) and Arithmetic and Logic Unit (ALU).

The process of input, storage, processing, and output is performed under supervision of the control unit. CU works closely with the instructions coming through the computer programs to command the other units in the computer.

ALU performs Arithmetic and Logic Operations such as multiplications, additions, subtractions, divisions, and comparisons etc. as it is commanded by the control unit.

In the CPU, its speed is an important factor. It is a measure of how many things it can perform in one second. Hertz (Hz) is the unit used to measure the speed of the CPU. This is also called CPU clock rate.

$$1000 \text{ Hz} = 1 \text{ kHz}$$
$$1000 \text{ kHz} = 1 \text{ MHz}$$
$$1000 \text{ MHz} = 1 \text{ GHz}$$

Today we are using computers with GHz range processors.

The processors are sometimes referred by its architecture, which determines how much memory it can address and control. 32 bits and 64 bits processors are the common architectures found in modern systems. 64-bit processors can run both 32 bit and 64-bit programs, but 32-bit processors cannot run 64-bit programs.

Processors are also described by the number of cores they possess. Most of the modern processors have more than one CPUs (Cores) combined into a single chip. Today CPU makers offer CPUs with two (dual-core), four (quad-core), six (hexa-core), and even eight cores (Octa-core) on a single chip.

Quad-core CPU
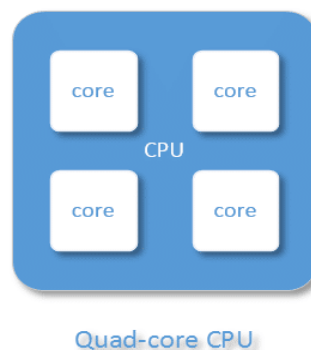
Cache memory is a super-fast RAM embedded into CPU chips. When the CPU takes the data from RAM, it also copies into the cache. When the CPU needs same data again, it first checks the cache. If it is there, the CPU uses that copy to save time.

Intel and AMD (Advanced Micro Devices) can be mentioned as examples for the pioneering companies who make CPUs (Manufacturers).

<u>Answer the following questions:</u>

1. What is the unit to measure the clock rate of the CPU?

    a. Byte

    b. Hertz

    c. Meter

2. The brain of any computer system is …………………

    a. the CPU

    b. the power supply unit

    c. the main memory

Output Unit:

It shows the result of processing to the computer user. Examples of output devices: monitor, projector, speaker, printer, etc.

Output devices can be classified into a set of groups by considering the type of data it could handle as follows.

- Output devices for texts (Printer)
- Output devices for graphics (Monitor)
- Output devices for audio (Headphone)
- Output devices for video (Monitor)

Monitors and printers can be considered as the most frequently used standard output devices.

<u>Answer the following questions:</u>

1. Speaker is an …………………

    a. input device

    b. output device

    c. none of the given options

2. The computer sends results to …………………. for displaying.
   a. output devices
   b. input devices
   c. storage devices

Monitors (Visual display unit):

There are two main types of monitors: flat panel displays (of various kinds), and cathode ray tubes (CRT). External projectors can also be considered as visual display units.

In computers, screens' resolution setting is the number of pixels (individual points of color) contained on a display monitor, expressed in terms of the number of pixels on the horizontal axis and the number of pixels on the vertical axis.
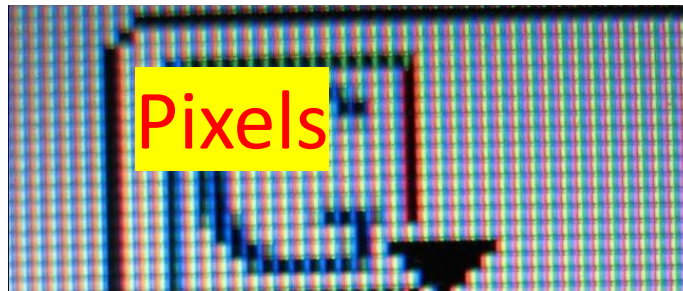
As an example, let's consider 1680 x 1050 resolution settings on a display. That means there are 1680 pixels on horizontal axis and there are 1050 pixels on vertical axis.

More screen resolutions:
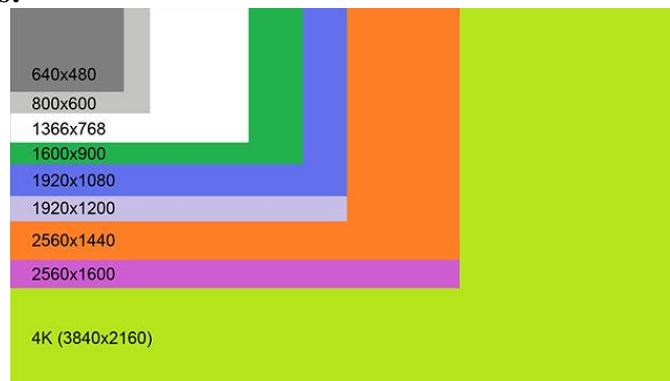
When we consider an image, it has its own pixel settings. The sharpness of the image on a display depends on the screen resolution settings and the size of the monitor.

Same pixel resolution will be sharper on a smaller monitor and gradually lose sharpness on larger monitors because the same number of pixels are being spread out over a larger number of inches as shown in the table below.

Monitor's horizontal width and pixels per inch (ppi)					
Resolution	**14"**	**15"**	**17"**	**19"**	**21"**
640×480	46	43	38	34	30
800×600	57	53	47	42	38
1024×768	73	68	60	54	49

Different types of monitors:

Flat panel displays (FPD)

- These monitors are very thin, light weight, and use very little power compared to CRT monitors.
- The most common flat panel display is liquid crystal display (LCD). It has a backlit layer of liquid crystal molecules sandwiched between polarizing filters.
- The older backlights are cold cathode florescent lamps (CCFLs). The newer LCDs have light emitting diode (LED) backlights.
- Organic light emitting diode (OLED) and quantum light emitting diode (QLED) are the latest technologies in FPDs.

Cathode ray tubes (CRT monitors)

A CRT monitor is bulky, and it has a large deep case because it contains a large cathode ray tube. Those are heavy and use a lot of electricity.


Answer the following questions:

1. Resolution of a monitor is decided based on …………………

    a. Bytes

    b. Pixels

    c. Hertz

2. CRT stands for …………………

    a. Cathode Ray tube

    b. Cylindrical Ray tube

    c. Computer Ray tube

Printers:

Printers output data (text and images) to paper. There are printers capable of printing three-dimensional objects made of plastic, metal, concrete or chocolates etc., as output. Those are called 3D-printers.

Different types of printers: Dot-matrix, Inkject, Laser and Thermal printers.

Dot-matrix printers: These are common in business because they can print multiple copies (carbon copies) of paper.
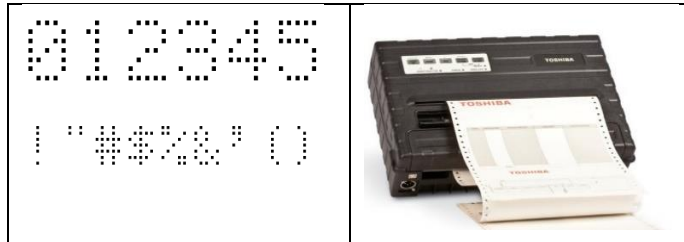
Inkjet printers: They use liquid ink cartritges. It creates text and images by spraying extreamly small droplets of ink on a paper.

Laser printers: They use toners as the ink. Toner is kind of powder. The printer tranfers toner to the paper by using a kind of electric attraction and let the powder to melt the powder on the paper.

Thermal printers: There are two technologies namely, direct thermal and thermal tranfer. Both use heat to enable printing in different ways. Direct thermal printers are widely used in receipt printers such as printers available in creadit card readers and fax machines. Thermal tranfer is more common in color thermal printers.

Multi-functional devices (MFD):

MFD is a printer (all in one printer) with one or other devices. Normally MFD combines a printer, copy machine, scanner and fax machine in one unit.

Motherboard:

The motherboard is a printed circuit board (PCB) and foundation of a computer. It allocates power and allows communication to and between the CPU, RAM, HDDs, and all other computer hardware components.
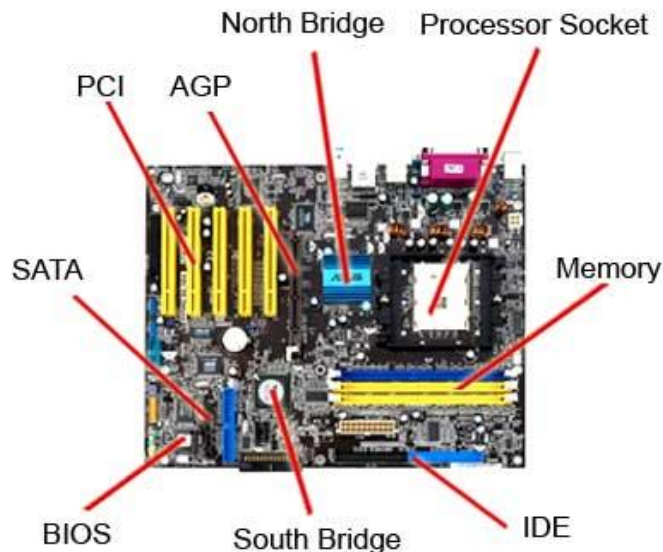
Answer the following questions:

1. ………………….. is the name of the circuit board that contains the CPU.

    a. Plug in card

    b. Sound card

    c. Motherboard

2. Motherboard is a …………………….

    a. Printed board

    b. PCB

   c. MB

Power supply unit (PSU):

Power supply is a hardware component of a computer that supplies all other components with power. The power supply converts a 110-115 or 220-230 volt AC (alternating current) into a steady low-voltage DC (direct current) usable by the computer hardware components.

Never open the casing of a power supply. It contains capacitors capable of holding a strong electrical charge, even if the computer is off and unplugged for an extended period.
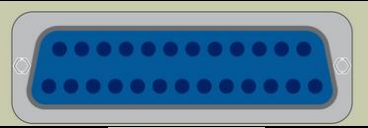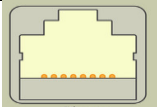
Computer ports and connectors:

Port is a place on your PC where you can plug in a cable or computer device. Different types of peripherals connect to computer in different ways by using multiple port types.
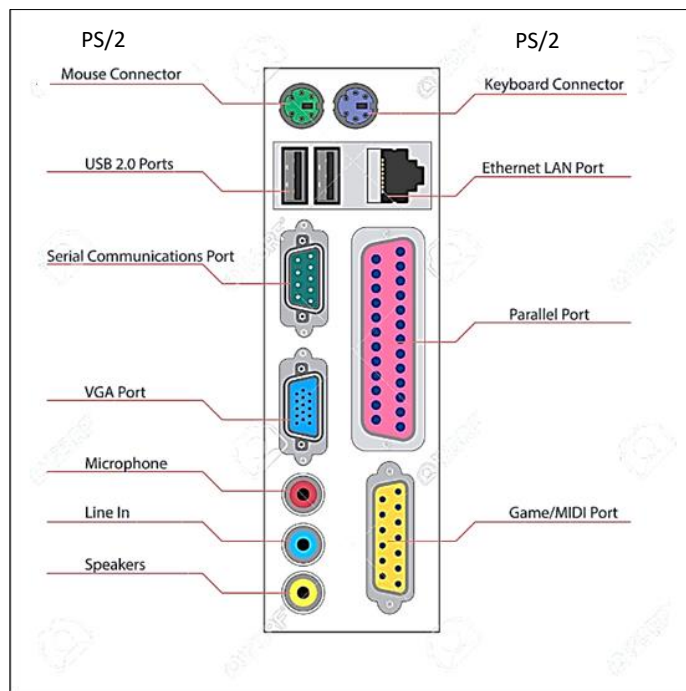
Port	Used to fix
PS/2	PS/2 type keyboards (Magenta Color) and PS/2 Mouse (Green Color)
Serial Communication Port	Serial Mouse, Modems any other serial device
Parallel Port (Printer Port)	Printers and Scanners
VGA Port	Monitor
USB Ports (Universal Serial Bus)	Most of the input and output units such as Keyboard, Mouse, Printer, Digital cameras or MODEMs
Network Ports	Connect network cables
Sound Ports (Audio Out, Line In)	Speakers, Microphones
HDMI	Connect Monitor, TV or Projector

Label the ports given below:

Port	Name

Different types of computers:

Computers are generally classified by their size and power. Size traditionally refers to the computer's physical mass, whereas power refers to the computer's speed and the complexity of calculations it can carry out.

There are five types:
1) Super computers
2) Mainframe computers
3) Minicomputers
4) Microcomputers (Personal computers)
5) Mobile computers

1) Super Computers

These are the fastest and most expensive computers. Ideal for performing complex calculations on a large set of data, they have very high processing speed and large data storage. The performance of a supercomputer is commonly measured in floating-point operations per second (flops).

Supercomputers are often used in research and simulations, predicting climate changes, testing nuclear weapons, forecasting hurricanes etc., NASA and ISRO uses supercomputers to track and control space discoveries.

Examples:
Tianhe-2; National Supercomputer Center in Guangzhou, China; cost $390 million; speed-33.86 petaflops
Jaguar; in United States; cost $104 million; speed-1.75 petaflops

2) Mainframe Computers

Powerful computers with high processing speed and data storage but not as powerful as super computers. Mainframe computers are mostly used by corporations, government agencies, and banks that need a way to store large quantities of information and handle online clients.
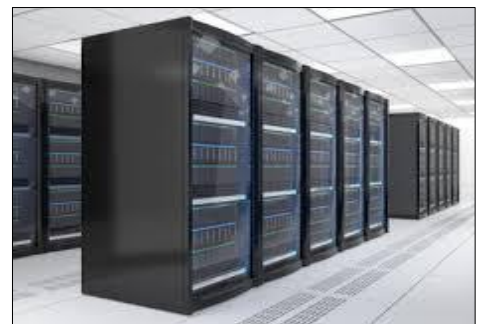
3) Minicomputers

A computer with processing and storage capabilities smaller than those of a mainframe but larger than those of a microcomputer. It is a multiprocessing machine (has more than one processor) that can support up to about 200 users at the same time.

A server can be an example of a minicomputer, but not all servers are minicomputers.

4) Microcomputers

A small single user computer based on a microprocessor. In addition to the microprocessor, a microcomputer has a keyboard for entering data a display for displaying information and hard disk for saving data.

Example: Desktop computers

5) Mobile computers

These are super small and can be carried around and taken from place to place (portable).

Examples: Laptops, Notebooks, Tablets, Smart phones, calculators etc.

Answer the following questions:

1. Tablets Laptops and Smartphones are examples of ………………….

   a. Mainframe computers

   b. Super computers

   c. Mobile computers

2. ………………….. are computers that support hundreds or thousands of users simultaneously.

   a. Mainframe

   b. Super computers

   c. Personal computer

3. Which of these is an example of personal computer?

    a. Mainframe computer

    b. Laptop

    c. Supercomputer

4. Choose which among the following has largest storage capacity.

    a. Laptop

    b. Minicomputer

    c. Supercomputer

5. Mainly ………………. computers are used to store information and handle online clients.

Software:

Computer software (often called **software**) is a set of instructions and associated documentation that tells a computer what to do or how to perform a task. It can mean all the software on a computer, including the applications, system and programming.
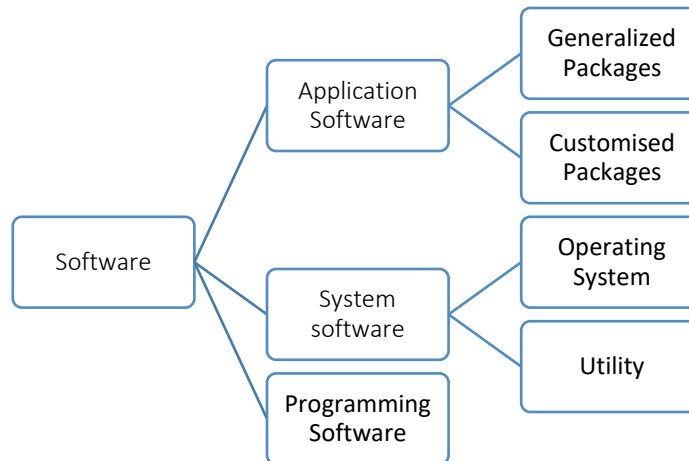

Answer the following questions:

1. ………………….. refers to a set of instructions

    a. Hardware

    b. Software

    c. Peripheral device

2. The instructions that you give to the computer in the form of program is called ………………….

    a. Hardware

    b. Software

    c. Peripherals

System software:

System software is a type of computer program that is designed to run a computer's hardware and application programs. If we think of the computer system as a layered model, the system software is the interface between the hardware and user applications. The operating system (OS) is the best-known example of system software. The OS manages all the other programs in a computer.
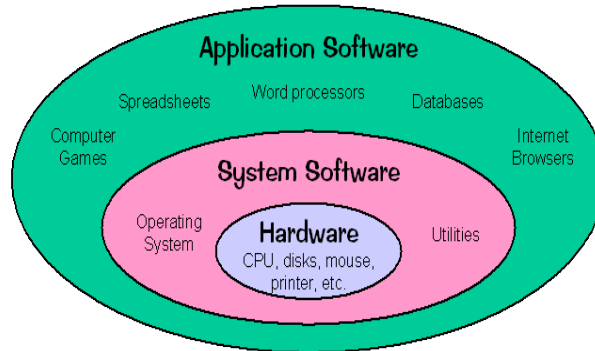

- *Operating systems (OS):* Operating System (OS) is a software which makes an interface between a computer user and computer hardware. It performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.

  Examples: Windows, Linux, Android, UNIX, iOS, DOS etc.
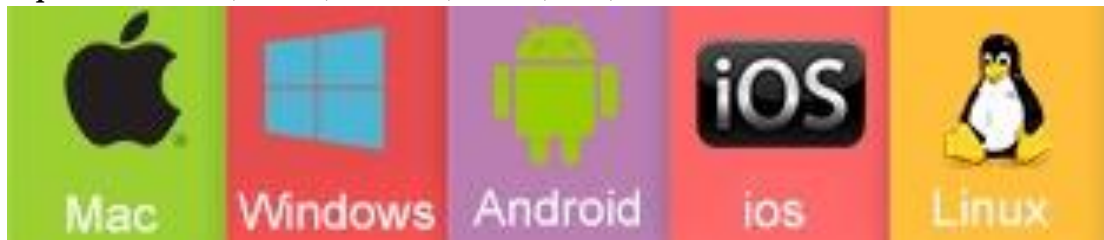
- *Utilities:* A utility or software utility is computer system software intended to analyze, configure, monitor, or help maintain a computer. Usually, a utility is smaller than a standard program in size and may be included with an operating system or installed separately. They bridge the gap between functionality of an OS and needs of users.

  Examples: Zip/Unzip file software, antivirus software, File managers, Backup software, Disk management software, Network monitoring software.

C cleaner
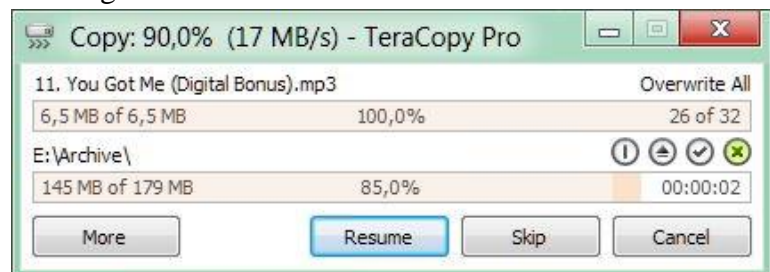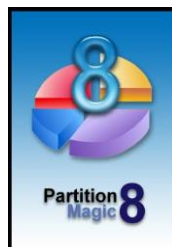
<u>**Answer the following questions:**</u>

1. Which of these is an example of utility software?

   a. Antivirus

   b. UNIX

   c. MS Excel

2. ………………….. is a type of computer program that is designed to run a computer's hardware and application programs.

   a. Programming software

   b. Application software

   c. System software

Application software:

Set of one or more programs to carry out operations for a specific application or task. It cannot run on itself, but it is dependent on system software to execute.

Examples: Photoshop, Library Management System, SITS, Payroll software, MS Office – (Prepare slide show, produce letters, making spreadsheets) etc.,

- *Generalized packages:* User-friendly software written to cater general needs such as preparing documents, drawing pictures. These are already available in the world, and you can simply install the software and use it.
  Examples: Photoshop, Web browsers, MS Office etc.

- *Customized packages:* Sometimes what you need is not available in existing software. This is especially true for businesses who have certain processes (specific requirements) that they want their own software to accommodate. In those scenarios, they need to build their own software (or hire a software developer build the application). This is customized software.
  Examples: SITS in MTC, Library Management System, Payroll software, Patient registration systems in hospitals, various banking applications.

<u>**Answer the following questions:**</u>

1. ………………….. software helps you carry out tasks, such as typing a document or creating a spreadsheet?

    a. Application

    b. Operating system

    c. Utility

2. Which of these is an example of application software?

    a. Antivirus

    b. UNIX

    c. MS Excel

Programming languages:

A programming language is a specialized form of computer language used by computer programmers to develop software programs. Examples of programming languages include C, C++, Java, Python, VB, and PHP. Programmers need to understand the rules, syntax, and structure of these languages in order to create software applications.

Programming software:

Programming software refers to a category of software tools designed to facilitate the creation of other software, including application and system software. These tools are built based on programming languages and help programmers in various tasks. Examples of programming software include language-specific code editors, debuggers, compilers, and Integrated Development Environments (IDEs).

For example:

Programming software	Supporting languages
Eclipse	Mainly Java
Apache NetBeans	Editor for Java, PHP, C/C++ and more.
Microsoft Visual Studio	Supports C/C++, VB, C#, Python and many more.
Notepad++	An open-source editor for windows
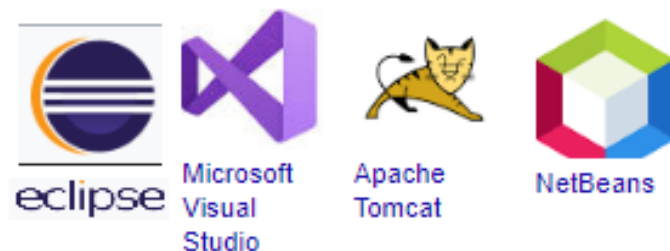
Difference Between Programming Languages and Programming Software:

	Programming Languages	**Programming Software**
Definition	A programming language is a set of formal rules and instructions used to communicate with a computer and create software applications.	Programming software refers to a collection of software tools that assist programmers in writing, testing, and debugging code to develop software applications.
Purpose	The primary purpose of a programming language is to provide a structured way for programmers to communicate with computers and instruct them on how to perform tasks.	The purpose of programming software is to enhance the productivity and efficiency of programmers by providing them with specialized tools to write, test, and manage code.
Functionality	A programming language defines the syntax and rules that programmers must follow to write code. It acts as a medium of communication between human programmers and machines.	Programming software encompasses various tools like code editors, debuggers, compilers, and IDEs, which assist programmers in writing, organizing, and debugging code.
Output	The output of a programming language is the source code, written in a specific language, that serves as instructions for the computer to execute.	The output of programming software depends on the specific tool being used. For instance, a code editor generates code files, a debugger helps identify and fix issues, a compiler translates source code to machine code, and an IDE provides a comprehensive development environment.

Answer the following questions:

1. Which of these is an example of Programming software?

    a. Antivirus

    b. Eclipse

    c. MS Excel

2. ………………….. is the main supporting language of eclipse software.

    a. C++

    b. VB

    c. Java

Software Copyright: Used by software developers and proprietary software companies to prevent unauthorized copying of software. Copying software is an act of copyright violation, is subject to civil and criminal penalties.

Freeware: Freeware is any copyrighted software, application or program that may be freely downloaded, installed, used and shared. Such programs are available to use at no cost to general end users. Freeware differs from free software, as the latter allows a user to modify source code for republishing or integration with other software.

Shareware: Shareware is software that you can use on a trial basis before paying for it. Unlike freeware, shareware often has limited functionality or may only be used for a limited time. However, once you pay for a shareware program, the program is fully functional, and the time limit is removed.

End User License Agreement: EULA is a legal contract between the manufacturer and/or the author and the end user of an application. The EULA details how the software can and cannot be used and any restrictions that the manufacturer imposes.

(e.g., most EULAs of proprietary software prohibit the user from sharing the software with anyone else).

Answer the following questions:
1. Which one of the following is a software copyright?

    a. Intel processor

    b. Norton

    c. Shareware

2. Which of these is true about freeware?

    a. It is free of cost software

    b. Provides limited usability

    c. EULAs is not needed for this copyright

Omani data protection legislation:

Omani data protection legislation, known as the Electronic Transactions Law (Royal Decree 69/2008), aims to establish a secure and regulated framework for electronic transactions.

The Law has two main objectives:

- Streamlining E-Transaction Processes: The legislation seeks to simplify and facilitate electronic transaction processes, making them more efficient and user-friendly.
- Creating a Safe Environment for E-Transactions: The Law focuses on ensuring a secure environment for electronic transactions to occur. It specifically addresses the protection of e-signature confidentiality and data integrity, safeguarding sensitive information during online transactions.

By enacting this legislation, Oman aims to promote the use of electronic transactions while providing the necessary legal framework and protections to instill confidence and trust in electronic dealings.

Install and uninstall software applications:

Install:

Step 1: Open file explorer.
Step 2: Go to the drive that contain installation file.
Step 3: Locate either setup or install file.
Step 4: Double-click setup or install file to start the installation.
Most installation routines lead you step by step through the installation process.

Uninstall:

Step 1: Open Control panel.
Step 2: Open programs and features.
Step 3: Click uninstall a program.
Step 4: Find the program to uninstall.
Step 5: Click uninstall button.
Step 6: follow the prompts.
Answer the following question:

1. Which of the following sequence is correct about uninstalling a program from a computer?
    a. Open program and features; Open control panel; Click uninstall a program
    b. Open control panel; Open program and features; Click uninstall a program
    c. Click uninstall a program; Find the program to uninstall; Open program and features

Minimum Laptop computer configurations for students:

Processor (CPU)	Intel Core i5-6xxx or equivalent
Operating System	Microsoft Windows 10 Professional x64 SP1
Memory	8 GB RAM
Storage	500 GB internal hard drive
Monitor/Display	14" LCD monitor, resolution of 1600 x 900 or better.
Network Adapter	Wireless adaptor (Wi-fi)
Other	Webcam, lock, carrying case, external hard drive for backups

Answer the following question:

1. Which of the following computer configuration is the most suitable for a student?

   a.

Intel Core i5-6200
Microsoft Windows 10 Professional x64 SP1
500 MB RAM
1 TB internal HDD
14" LCD monitor, resolution of 1600 x 900
Wireless adaptor (Wi-fi)
Webcam, lock, carrying case, external hard drive for backups

   b.

Intel Core i5-5200
Microsoft Windows 10 Professional x64 SP1
8 GB RAM
50 GB internal HDD
14" LCD monitor, resolution of 1600 x 900
Wireless adaptor (Wi-fi)
Webcam, lock, carrying case, external hard drive for backups

   c.

| |
|---|
| **Intel Core i5-6200** |
| **Microsoft Windows 10 Professional x64 SP1** |
| **8 GB RAM** |
| **500 GB internal HDD** |
| **14" LCD monitor, resolution of 1600 x 900** |
| **Wireless adaptor (Wi-fi)** |
| **Webcam, lock, carrying case, external hard drive for backups** |

Computer Ergonomics: Science of adjusting your work environment to fit your body and make it more comfortable.

Major health problems caused by computer usage:

- Eye disease
- Bad posture
- Hurting hands
- Muscle and joint injuries
- Computer stress injuries

Ergonomics principles helps reduce stress and eliminate injuries and disorders associated with muscles, bad postures etc.

Tips for an Ergonomic workstation:
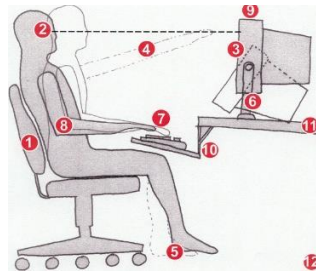
1. Use a comfortable and ergonomic chair.

2. Position the top of monitor casing 2-3" (5-8 cm) above eye level (arm's length away from you).

3. There should be no glare on screen, use an optical glass anti-glare filter where needed.

4. Sit at arm's length from monitor.

5. Put your feet on floor or stable footrest.

6. Use a document holder, preferably in-line with the computer screen.

7. Position your wrists flat and straight in relation to forearms to use keyboard/mouse/input device.

8. Let arms and elbows relaxed close to body.

9. Place the monitor and keyboard at the center in front of you.

10. Tilt downward the platform adjacent to keyboard.

11. Use a stable work surface.

12. Take frequent short breaks (micro breaks)

Answer the following questions:

1. Which of the following is considered as a tip for an ergonomic workstation?

    a. Position the top of monitor casing 20-30" above eye level.

    b. Put your feet on floor or stable footrest.

    c. There should be glare on the screen of the computer

2. While using computer we must take frequent breaks. (True or False)

Chapter1 Exercise

A. <u>**Answer the following questions:**</u>

    1. What is a computer?

    2. Write three uses of computers.

    3. Label the given block diagram:
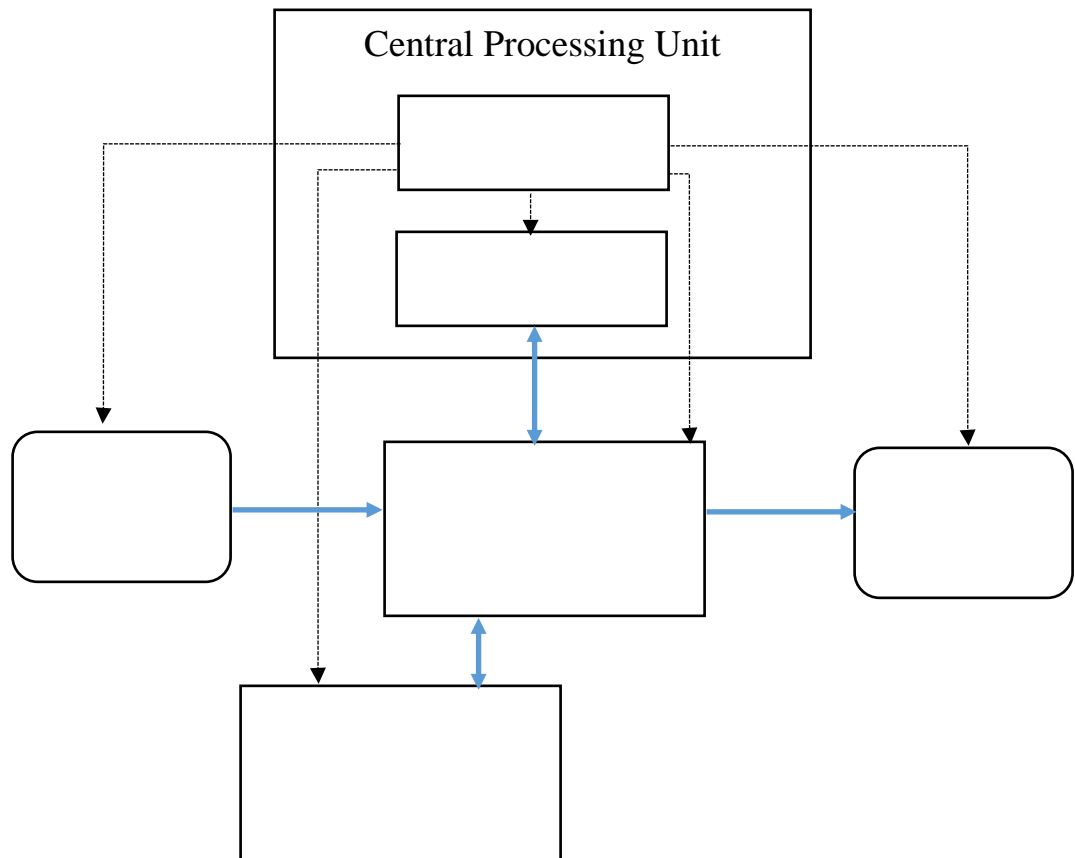
1	Secondary Storage	2	Input Devices	3	ALU	4	Main Memory	5	Control Unit	6	Output Devices

4. Draw the hierarchical structure of computer components.

5. What is a Programming language? Give two examples.

6. What is computer hardware?

7. What is a CPU?

8. What is the function of input devices?

9. Draw the hierarchical structure of software to explain its classification.

10. What are utilities?

11. What is the use of software copyrights?

B. Fill in the blanks:

1. CPU Clock speed is measured in ………………….

2. QWERTY is a name of …………………...

3. ………………….. is an example of text-based Output device.

4. ………………….. is a Hardware that stores information.

5. A group of …………………. bits are called as byte.

6. The …………………. is a printed circuit board which is considered as the foundation

   of a computer.

7. ………………….. is a set of instructions.

8. Give an example of generalized package ………………….

9. VGA Port is used to connect ………………….

C. Write the full text of the following:

1. CRT:

2. LCD:

3. LED:

4. RAM:

5. ROM:

D. **Multiple choice questions:**

1. What is considered as the brain of the computer?

   (a) ALU

   (b) CPU

   (c) CU

2. How does a computer work?

   (a) Processing→ input→Output

   (b) Input→ Processing→ Output

   (c) Output→ Processing→ Input

3. Which of the following is NOT a secondary storage device?

   (a) Hard Disk Drive

   (b) ROM

   (c) CD/DVD

4. What does ALU means?

   (a) Additional Logical Unit

   (b) Arithmetic Logic Unit

   (c) Alcatel-Lucent Common

5. Which of the following program is not a utility?

   (a) Unix

   (b) Zip/ Unzip

   (c) Window defender

6. A software that is free to use for a limited period of time as a trial version is called:

   (a) Freeware

   (b) Shareware

   (c) Open-source software

7. Which of the following statement is true?

   (a) 1KB = 1024 bytes

   (b) 1 MB=2048 bytes

   (c) 1 MB = 1000 kilobytes

8. The computer sends results to ………………….
   (a) Output devices

   (b) Motherboard

   (c) Input devices

9. What kind of port would I connect a printer to?
   (a) Parallel port

   (b) PS/2 port

   (c) VGA port

E. **Identify and write the name of the given devices in the given space from the given list:**

Desktop computer	Mouse	Trackball	Tablet	Touchpad	Smart phone

As an example, first one is done for you:

|	
	Mouse

Chapter2: Basic operation and file management

The Power Button: for turning on the CPU

Starting the Computer, what is happening in the background? (Boot process)

Boot Process is a sequence of events that occurs between the time the computer is turned on and the time when windows log in screen is seen.

Bootstrap program is a special program in ROM (ROM – BIOS) that receives power and begins the boot process as follows.

Power On ➡ Copy ROM-BIOS into Memory ➡ POST ➡ Load the OS into Memory ➡ Starting Windows
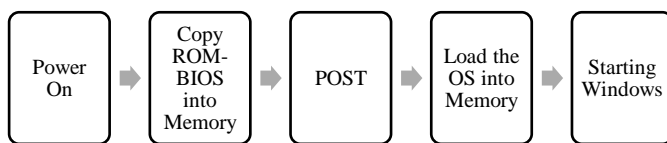
1) Turn On PC.
2) Copy the Bootstrap program in ROM (ROM-BIOS) to Main memory (RAM).
3) Begins POST (Power on self-test) to check whether all computer hardware devices are fine.
4) When all devices are fine, it checks boot disk (Hard Disk) and loads operating system into RAM.
5) Starting Windows.

**Answer the following questions:**

1. What do you do to start the boot process?

   a. Install the bootloader

   b. Find the CPU

   c. Push the power button

2. In ROM BIOS, the acronym BIOS stands for:

   a. Basic Intuitive Output Set

   b. Basic Input Organizational System

   c. Basic Input Output System

Getting started with Windows 10:

Once you've signed in, the first thing you'll see in windows 10 is the desktop. You can think of the desktop as the main workspace for your computer. From here, you can view and manage your files, open applications, access the Internet, and much more.
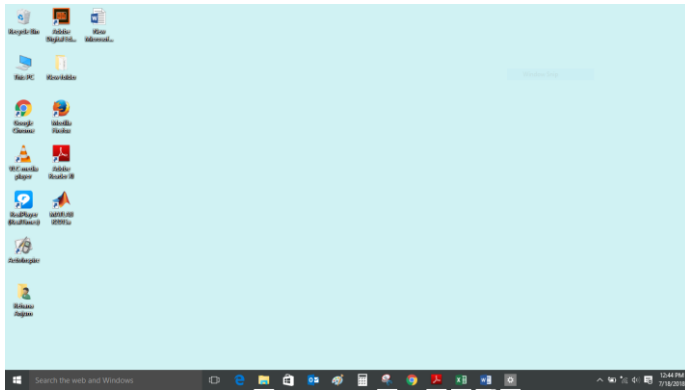
Icon: It is a small picture that links to a file or program.

Task bar: The long horizontal bar at the bottom of the screen which displays the buttons for open programs and files.

Opening applications:
Use the Start menu to open programs on your computer, just like with previous versions of Windows. To do this, click the Start button in the bottom-left corner, then choose the desired application. If you don't see the one you want, select **All apps** to see a full list of applications.
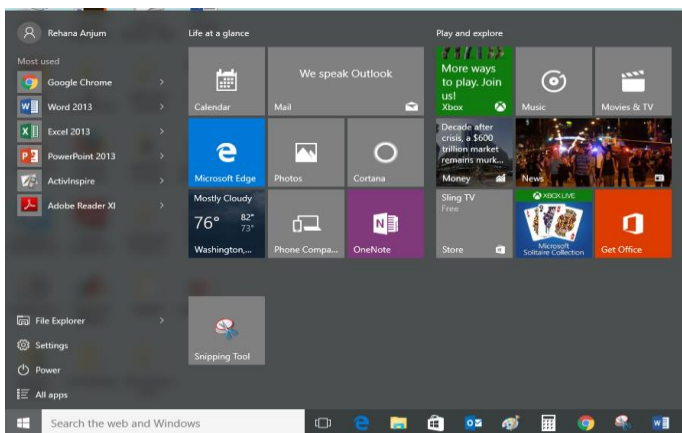
Working with files:
You'll use the File Explorer to manage your files and folders. To open File Explorer, click the File Explorer icon on the taskbar or double-click any folder on your desktop.
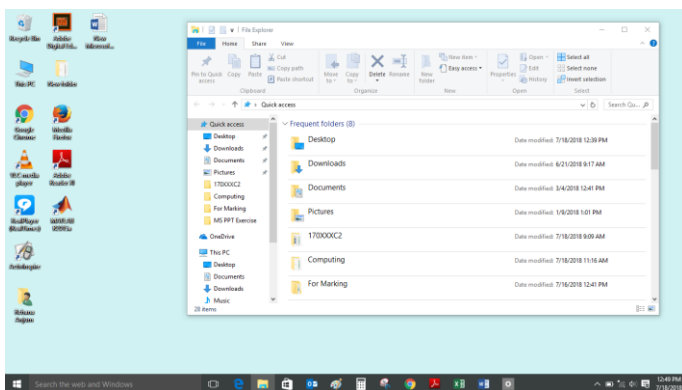
Answer the following questions:

1. Small picture that represents a specific program on a desktop is called

    a. Folder

    b. File

    c. Icon

2. On screen work area which contains windows icons, menus and dialog boxes is called

    a. Frame

    b. Desktop

    c. Screen

Searching for files and apps:

To search for something on your computer, like a specific file or application, click the Start button, then start typing.
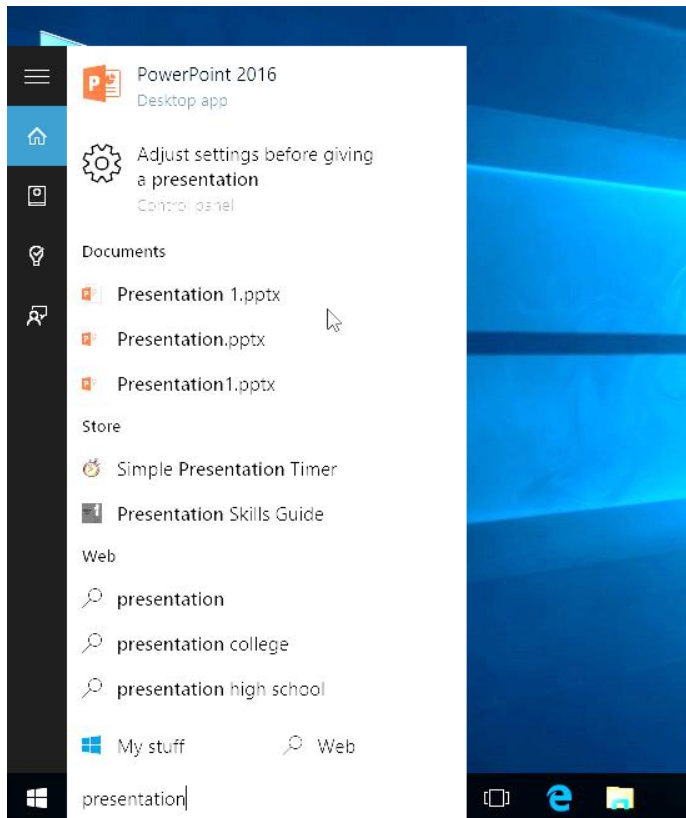
Adjusting computer settings:

You'll use the Settings app to change the most important settings on your computer, like your network and display options. To open the app, click the Start menu, then select Settings.
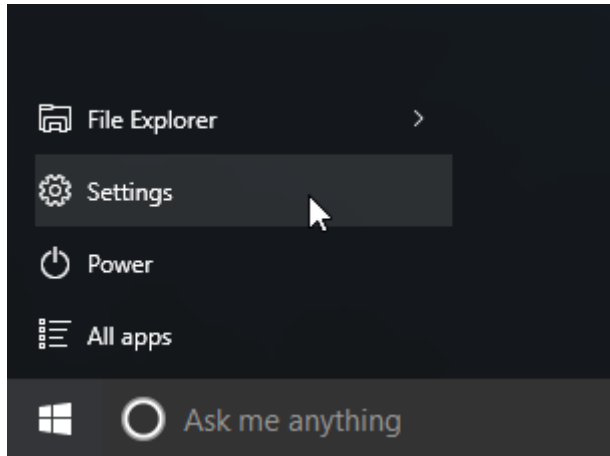
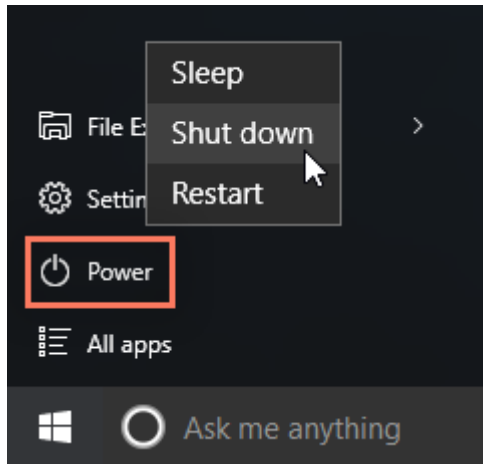**Control panel is also used to adjust computer settings:**
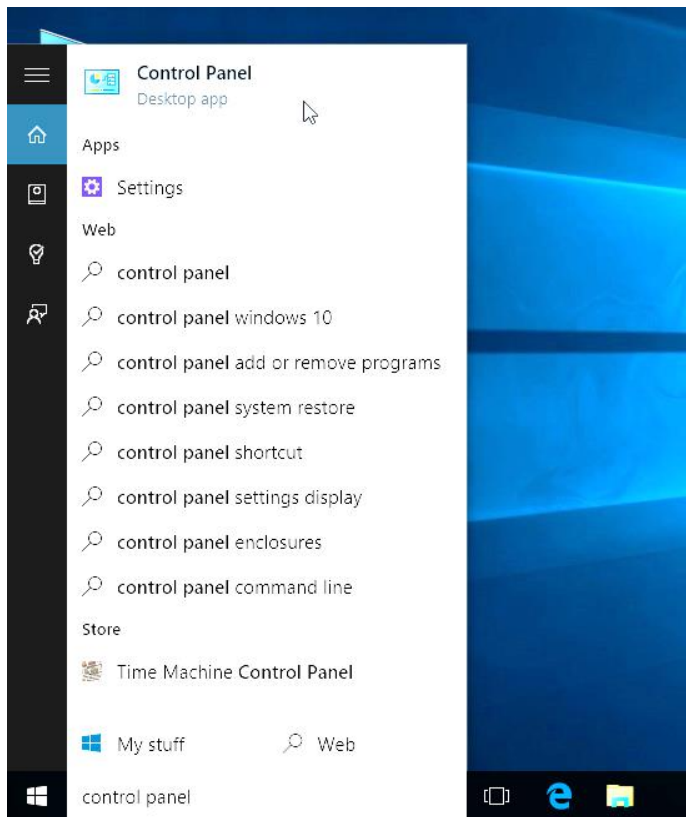
Shutting down your computer:

When you're done using your computer, it's important to shut it down properly. To do this, click the Start button, then choose Power > Shut Down.

Exiting the computer properly:

Always shutdown or logoff the computer properly. It will protect the software and data files being corrupted or lost.

Other ways to exit the computer properly:

| Method	Details
Switch user	Switches to another user account without logging out from the current account.
Log off	Logs out from the current user account
Lock	Hides the Desktop behind the logon screen.
Sleep	This uses very little power, your PC starts up faster, and you're instantly backed to where you left off.
Hibernate	Hibernate mode is very similar to sleep, but instead of saving your open documents and running applications to your RAM, it saves them to your hard disk. This allows your computer to turn off entirely, which means once your computer is in Hibernate mode, it uses zero power. It takes longer to resume from hibernate than sleep.
Restart	Closes all open items and restarts the computer.

1. Which of the following methods is an acceptable way to shut down the computer?

    a. Turn the computer off by pressing power button on the system unit

    b. Press reset button on the system unit

    c. Press shutdown button in windows start menu

2. Why should we shut down a computer correctly?

    a. We can avoid serious file system damages

    b. Because there is no other way to do it

    c. It is very quick

Ribbons, menus, and toolbars
Ribbons, menus, and toolbars are three methods that programs can use to show users what commands are available in those programs.

Ribbons:

The ribbon is a rectangular area that fits across the top of an application window. The ribbon is composed of several tabs, each of which represents a subset of program functionality. The tabs contain related commands that are organized, grouped, and labeled.
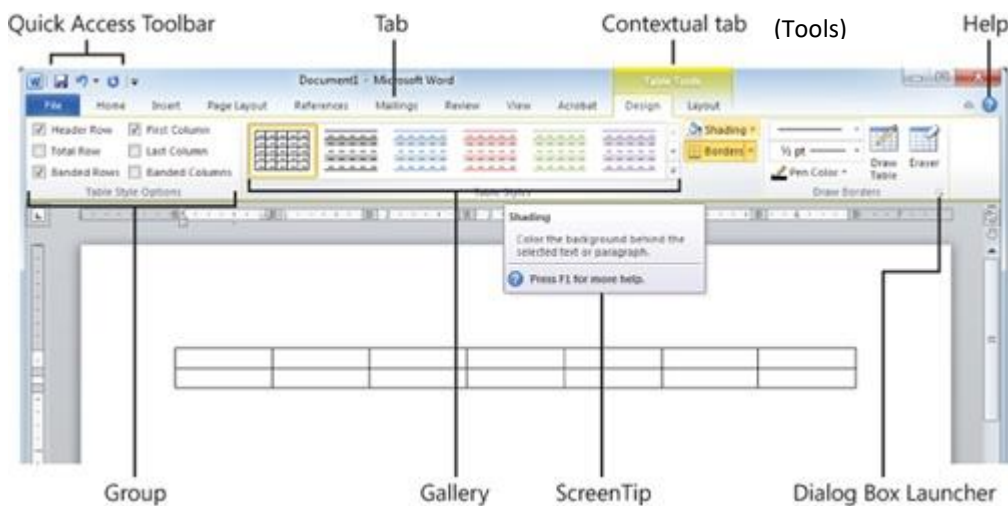
Menus:

A menu is a group of the main commands of a program arranged by category such as File, Edit, Format, View, and Help. Menus are usually displayed on a menu bar typically located near the top of a window. The following illustration shows elements of menus.
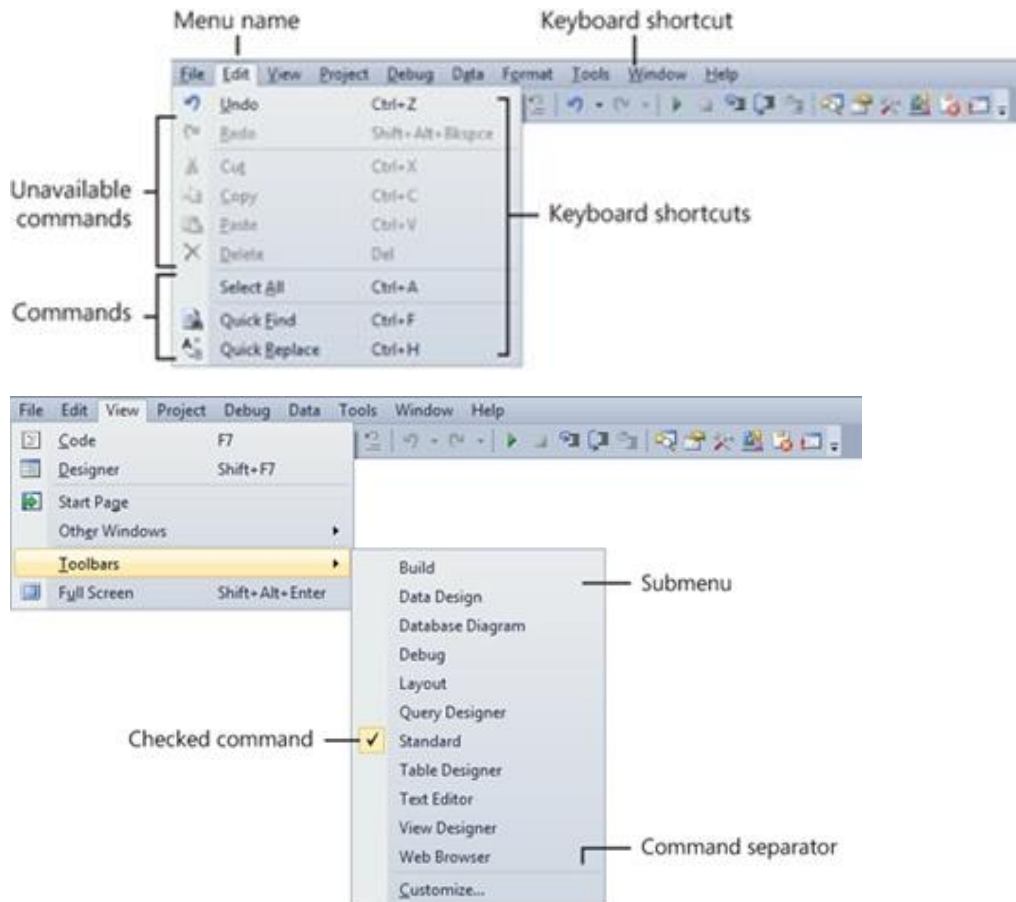
Toolbars:

A toolbar is a grouping of commands for efficient access. Unlike a menu, which contains a comprehensive list of commands, a toolbar contains the most frequently used commands. Most toolbars are customizable, enabling users to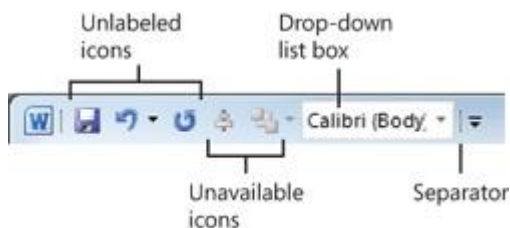 add or remove toolbars, change their size and location, and even change their contents. Toolbars contain buttons. A toolbar button can have a submenu, which is indicated by an arrow next to it.

Mini toolbar:

A set of controls that appears in context when an object is selected. A user can use these controls to perform actions upon the object. For example, when a user selects text, the formatting mini toolbar automatically appears above the text.

File Management:
The system that an operating system or program uses to organize
and keep track of files.

Files: Files are collection of information. A file is created using a
specific program and the type of program determines what type of
file it is.

File name Extensions: A file name extension is a suffix added to
the base name of a computer file and separated from a base name by a dot (.). Operating system and
application programs use the file name extension to identify which program created the file and which
program may be used to open the file.
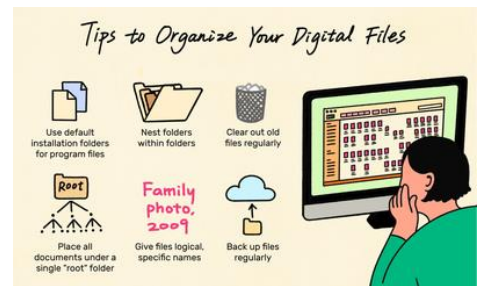
Extension	Type of the file
.doc or .docx	Word or WordPad document
.jpg or .jpeg	Picture or graphic file
.txt	Notepad text file
.xls or .xlsx	Excel spreadsheet
.htm or .html	HTML file (webpage)
.ppt or .pptx	PowerPoint presentation
.mdb or .accdb	Access database
.exe	Windows executable files
.zip or .rar	Archive/compressed files

Answer the following question:

1. Do all files have filename extensions at the end of their filenames? (Yes / No)

Folders:
A folder is a storage space that many files can be placed into and be grouped together. Folders are used
to organize files in the computer.
A folder can also contain other folders called **sub folders**.

Drives: A drive, or disk drive, is a hardware on which you can store files and folders.

Answer the following questions:

1. Which one of the following arrangements is the correct order of hierarchical structure in file
   explorer?

   a. Drives → Folders → Files

   b. Drives → Files → Folders

   c. Folders → Files → Drives

2. What do we call folders within a folder?

   a. Sub folders

   b. Folder within files

   c. Folder subs

Chapter2 Exercises

A. <u>**Circle the right Answer:**</u>

1. Which of the following is an acceptable way to shut down the computer?
   - (a) Press reset button
   - (b) Press power button in the system unit
   - (c) press shutdown button in windows 10

2. Windows stores all the deleted files in ………………
   - (a) Desktop
   - (b) Control panel
   - (c) Recycle Bin

3. Which of the following options is used for searching for a file in the file explorer?
   - (a) Status bar
   - (b) Address box
   - (c) Search box

4. The control panel is used to ………………
   - (a) Store deleted files
   - (b) Search for specific application or file
   - (c) Adjust computer settings

5. The Address bar of file explorer contains ………………
   - (a) Phone number
   - (b) Person name
   - (c) Location of file or folder (file path)

6. Which is NOT true about sleep and exit from the computer?
   - (a) This uses very little power
   - (b) PC starts up very slowly
   - (c) You're instantly backed to where you left off
7. Immediately after power is on, the computer ……………….......
   - (a) loads the OS
   - (b) goes through POST
   - (c) copies ROM-BIOS into memory

8. Which file name extension is given to a PowerPoint file?
   - (a) .doc
   - (b) .pptx
   - (c) .exe

A. **Match the file type with an appropriate software program:**

	Extension		Program
A	.docx	1	Photoshop
B	.pptx	2	Internet Explorer
C	.jpg	3	Word
D	.htm	4	Operating System
E	.exe	5	PowerPoint
F	.mp3	6	Media Player

A		B		C		D		E		F	

B. **Answer the following questions:**

1. What is a file?

2. What is a folder?

3. What is a drive?

References:

[1]. Comp TIA IT Fundamentals, All-in-one EXAM GUIDE (Exam FCO-U51), ISBN: 978-1-25-983769-2

[2]. IC3 INTERNET AND COMPUTING CORE CERTIFICATION GUIDE, CCI Learning Solutions, ISBN 978-1-55332-440-9

[3]. Gcflearnfree.org. FREE COMPUTERS TUTORIALS AT GCFLEARNFREE
[Online] Available at: https://www.gcflearnfree.org/topics/computers/

[4]. Edupub.gov.lk. INFORMATION AND COMMUNICATION TECHNOLOGY
[Online] Available at: http://www.edupub.gov.lk/Administrator/English/10/ICT%20g
10%20E%20new%20syllbus/chapter%201.pdf

[5]. Edupub.gov.lk. FUNDAMENTALS OF A COMPUTER SYSTEM
[Online] Available at: http://www.edupub.gov.lk/Administrator/English/10/ICT%20g-
10%20E%20new%20syllbus/cha%202.pdf

[6]. Edupub.gov.lk. OPERATING SYSTEMS
[Online] Available at: http://www.edupub.gov.lk/Administrator/English/10/ICT%20g-
10%20E%20new%20syllbus/Chapter%205.pdf

[7]. Windows.microsoft.com. COMPRESS-AND-UNCOMPRESS-FILES-ZIP-FILES
[Online] Available at: http://windows.microsoft.com/en-hk/windows-vista/compress-and-uncompress-files-zip-files

[8]. Edupub.gov.lk. THE INTERNET AND THE ELECTRONIC MAIL
[Online] Available at: http://www.edupub.gov.lk/Administrator/English/11/ICT%20G11%20(E)/cha%203.pdf

[9]. Scpl.org. BASIC INTERNET SKILLS SERIES
[Online] Available at: http://www.scpl.org/resources_services/internet_links/Basic_Internet.pdf

[10]. Cert.gov.om. ELECTRONIC TRANSACTIONS LAW
[Online] Available at:
http://www.cert.gov.om/library/information/Electronic%20Transactions%20Law%20English.pdf

[11]. Vfu.bg. BASIC COMPUTER CONCEPTS
[Online] Available at: http://vfu.bg/en/e-Learning/Computer-Basics--computer_basics2.pdf

[12]. COMPUTER ESSENTIALS 2017, Authors: Timothy J. O'Leary, Daniel O' Leay, Linda I. O'Leary, 978-1-259-92127-8 Publisher: Mc Graw Hill Education, ISBN: 978-1-259-92127-8

[13]. WINDOWS 8 FOR DUMMIES, Author: Andy Rathbone, Publisher: Hoboken, NJ: Wiley, 2012, ISBN – 9781118134610

English Term	Arabic Term	English Term	Arabic Term
Antivirus Software	برامج مكافحة الفيروسات	Data Storage Device	ادوات تخزين البيانات
Application Software	برامج تطبيقية	Data Transfer Rate	معدل تحويل البيانات
Arithmetic Logic Unit - ALU	وحدة الحساب المنطقية	Decompress Files	تحويل الملفات المضغوطة الى ملفات غير مضغوطة
Attachment	مرفق	Decryption	فك التشفير
Audio	سماعي	Dial-Up Internet Connection	الاتصال الهاتفي من خلال الإنترنت
Backup Files	ملفات احتياطية	Digital Certificate	شهادة رقمية
Bit (in computer memory)	وحدة (في ذاكرة الحاسوب)	Digital Versatile Disk - DVD	القرص الرقمي المتنوع
Blog	مدونة	Domain Name	اسم النطاق
Broadband Internet Connection	وصلة الإنترنت ذات النطاق العريض	Download	تحميل
Byte	جزيئ	Dual Core Processor	معالج رئيسي ثنائي
Central Processing Unit (Processor)	وحدة المعالجة المركزية	E-Learning	تعلم الكتروني
Circuit Board	لوحة دائرة كهربائية	Electronic Device	جهاز الكتروني
Click (mouse click)	ينقر / نقرة بفأرة الحاسوب	E-Mail	بريد الكتروني
Client Devices	أجهزة العميل	E-Mail Account	حساب بريد الكتروني
Compact Disk - CD	قرص مضغوط	Email Attachment	مرفق بريد الكتروني
Compressed Files	ملفات مضغوطة	E-Mail Message	رسالة بريد الكتروني
Computer Application	تطبيق الحاسوب	Encryption	التشفير
Computer Ergonomics	بيئة عمل الحاسوب	Execute (in computer program)	تنفيذ (في برنامج كمبيوتر)
Computer File	ملف حاسوب	Exploit Weakness	استغلال الضعف
Computer Hardware	أجزاء الحاسوب	Extension	وصلة

Computer Monitor	شاشة حاسوب	Extract	يسخرج
Computer Mouse	فأرة حاسوب	Extranet	الشبكة الخارجية
Computer Network	شبكة حاسوب	Fiber Optic Cable	سلك الألياف الضوئية
Computer Network Switch	مفتاح شبكة الكمبيوتر	File Explorer	باحث الملفات
Computer Operating System	نظام تشغيل الحاسوب	File Name Extension	اسم ملف اضافي
Computer Port	منفذ الحاسوب	Firewall	نظام الحماية
Computer Program	برنامج حاسوب	Flash Memory	ذاكرة خارجية متنقلة
Computer Screen	شاشة حاسوب	Floppy Disk Drive	محرك الأقراص المرنة
Computer Security	أمن الحاسوب	Folder	ملف
Computer System	نظام الحاسوب	Formatting Storage Media	شطب الملفات من وحدة التخزين
Confidential Data	معلومات سرية	Glass Anti-Glare Filter	فلتر مضاد للوهج
Connection	توصيل/ربط	Hacker	قرصان
Connector	وصلة	Hacking	قرصنة (عمليات اختراق للحصول على معلومات الاخرين)
Control Panel	لوحة التحكم	Hard Disk Drive	محرك القرص الصلب
Copy	ينسخ/نسخة	Hardware Device	اجهزة وادوات
CT Scanner {Computed Tomography (CT) Scan}	التصوير المقطعي المحوسب	Home Page (in websites)	الصفحة الرئيسية
Data	بيانات	Hypertext Markup Language (HTML)	لغة ترميز النص التشعبي