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CODING



# CYBERWAVE

Foundations of Information & Communication Technology

COVERS

INFOBITS

EXERCISES

LAB ACTIVITY

PROJECT WORKS



Updated to  
**Windows 10**  
**MS Office**  
**2010**

**Operating System**  
**&**  
**MSW Logo**

**4**

**LEVEL**



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# ***CYBERWAVE***

Foundations of Information & Communication Technology



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computer education

## **CYBERWAVE : Level - 4**

*(Foundations of Information & Communication Technology)*

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# Preface

We are living in a world powered by computers. Today, computers are present in all sectors of our society. Thus, knowledge of Computer Science is increasingly becoming an essential skill for staying competitive in the future.

**Cyber wave Computers** is a series of 10 books for classes 1 to 10. The series introduces concepts in a step-by-step manner using simple language. The content provides the latest facts and figures. The screenshots included in the series are of **Windows 7**, updated to **windows 10** and **Microsoft Office 2010** version.

In Books 1 and 2, the basics of computers, including its various parts, have been introduced. MS Paint software, which will help students to acquire skills for using mouse and keyboard, has been introduced. In Books 3 to 10, **programming language** software, **animation software** and **coding** have been introduced in respective classes.

Most of the topics/chapters have been covered in a child-friendly manner along with sufficient definitions, diagrams and tables.

Activities are designed to bring out the joy of learning by discovering. Exercises, Worksheets, lab questions have been developed keeping in mind the learning ability of the students.

We sincerely welcome constructive feedback and suggestions to improve the series which will be incorporated in further publication.

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*With regards  
Informatix & Team*



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# Computer Memory

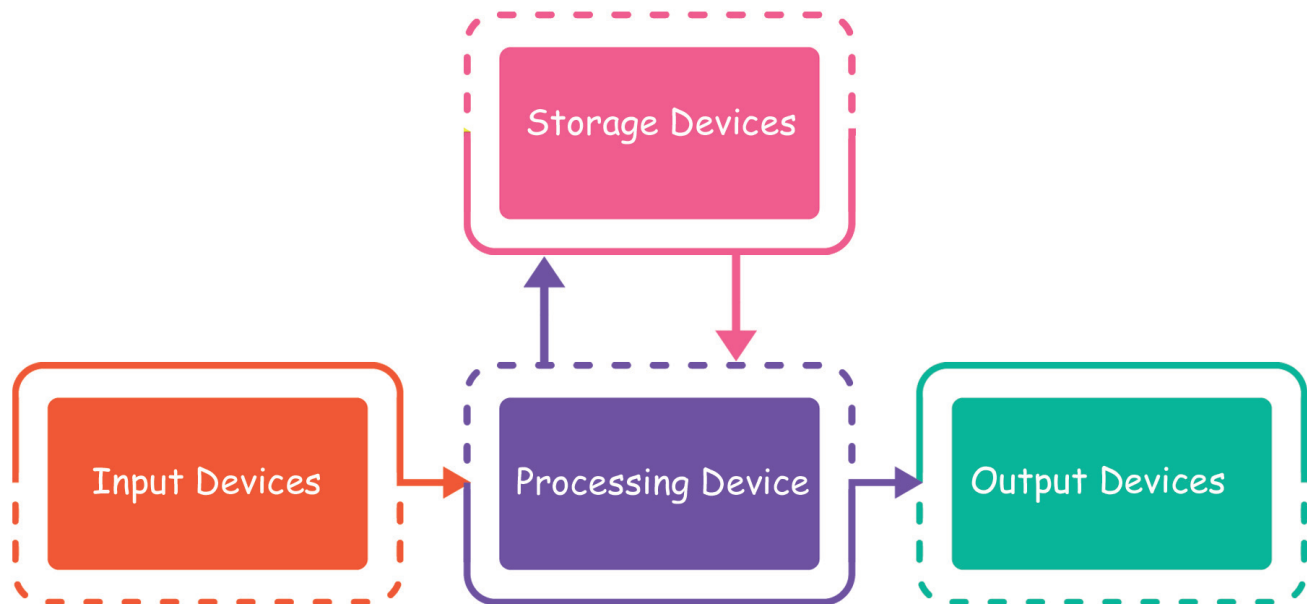
A computer is an electronic machine that takes input, manipulates it and produces the output. Today, it is impossible to think about doing a thing without computer. It is considered to be a wonder machine.

## Computer System



A computer is made up of several units. Each of these units is designed to perform a specific task. However, none of these units can function independently. All these units are integrated together to form a computer system. There are four basic units of a computer system.

- Input devices
- Processing device
- Output devices
- Storage devices



## Input Devices



Input devices are the devices that are used to enter data and instructions into a computer system. These devices allow communication between the user and the computer system. Keyboard and mouse are the most common input devices.



Keyboard



Mouse



Microphone



Webcamera



Scanner

## Output Devices



Output devices are used to display the results produced by a processor. The most common output devices are monitor, printer, speaker, headphone and projectors.



Monitor



Keyboard



Speakers



Headset



Projector

## Processing Device



The Central Processing Unit or CPU is the main processing device of a computer. It is also known as the brain of the computer.





## Computer Memory/Storage



Among the major advantages of a computer system, its huge data storage capacity makes it a unique machine. Computer being an electronic device store and process everything in the form of electric pulses. So before we start with storage devices, let us learn how the data is represented in computer system.

## Data Representation in Computer



Computer understands the language of electricity which can be either in switch ON or switch OFF mode. The switch ON mode in computer is represented as 1 while switch OFF with 0. So, computer understands only two digits i.e., 0 and 1. These two digits are known as Binary Digits or BITS. BIT is the smallest unit of memory in computer.

**BITS = 0,1**

**BYTE = 8 bits (e.g., 11000101)**

So, the computer data is represented in bits and bytes. The various memory units used to measure the large amount of data are tabled below:

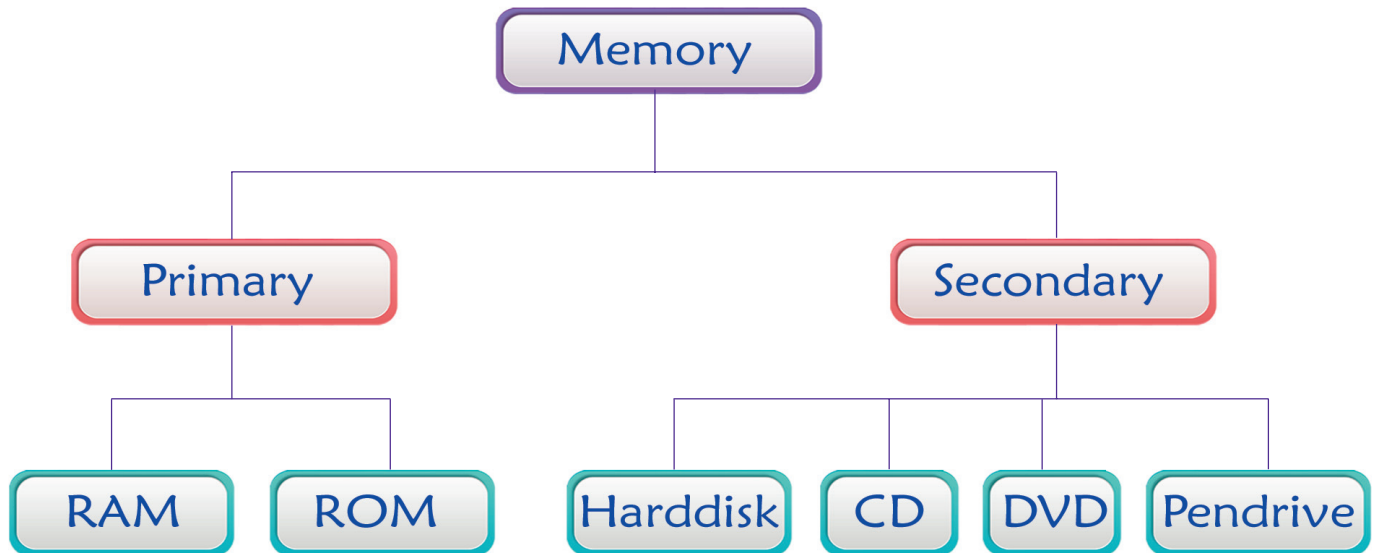
1Byte	8 Bits	1024 TB	1 Petabyte (PB)
1024 Bytes	1 Kilobyte (KB)	1024 PB	1 Exabyte (EB)
1024 KB	1 Megabyte (MB)	1024 EB	1 Zettabyte (ZB)
1024 MB	1 Gigabyte (GB)	1024 ZB	1 Yottabyte (YB)
1024 GB	1 Terabyte (TB)	1024 YB	1 Brontobyte (BB)

## Types of Computer Memory



Computers are basically machines built to store and manipulate information. Computers consist of many components in which information is stored and manipulated. These components are called memory. Computers have more than one form of memory. We can generally classify them into primary and secondary memory.

- ▶ Primary Memory or Main Memory
- ▶ Secondary Memory



## Primary Memory



Primary memory is called as the main memory of the computer. Primary memory is directly related to the Central Processing Unit (CPU). This can be of two types:

- ▶ RAM
- ▶ ROM

## Random Access Memory (RAM)



This is temporary memory, so the information stored in it is lost as soon as we switch OFF the power supply. That's why it is also called **Volatile Memory**. It stores the user's data and instructions along with the results produced by the system.

## Read Only Memory (ROM)



This is permanent electronic memory. ROM allows the user to read, but the user cannot store the data in it. Hence it is called Read Only Memory. It holds these instructions even after the power supply is switched OFF. That's why it is also called **Non-volatile Memory**

## Secondary Memory



Secondary memory is the one which is permanent. The contents of secondary memory do not disappear when the power is turned off. Secondary memory is used to store large amount of data permanently. This is also known as external Memory and is used to store user's data permanently for later use. It holds the information till it is erased or changed.

The secondary memory often comes in the form of hard disks, CD's / DVD's. The latest super computers (as of 1998) have a million megabytes of memory. Today's latest model of hard disk drives in the personal computer market can hold about 500,000 megabytes (500 gigabytes) of memory.

## Harddisk



Hard disk is a storage device that is used for storing. It can store a very large number, which can range from 500 GB to 5TB.

Hard disk is actually made up of multiple metallic discs coated with magnetic material. These discs are known as Platters. Information on these discs is recorded on both the sides in the form of concentric circles called tracks, which are further divided into sectors. This Harddisk also contains the system files to spring life to the computer.



## Compact Disk



It is a thin plastic disc coated with reflective metal. Data in these discs is stored optically. Its storage capacity is up to 700 MB and it can store variety of data like pictures, movies, sounds, etc.



Do you know?



*When we start the computer, operating system is loaded into RAM. Any software that we run is also loaded in RAM. It means that a computer with more RAM will work faster than a computer with lesser RAM.*



CDs can be of different types :

**CD-ROM** : In these, data is recorded at the time of manufacturing which cannot be erased or changed.

**CD-R** : These are the recordable CDs on which data can be stored, but once only.

**CD-RW** : These are re-writable discs and their data can be changed any time, if needed.

### Digital Versatile Disc (DVD)



These are also the optical storage devices like CDs but their storage capacity is very high. A single layered DVD can store up to 4.7 GB of data.



### Flash / Pen Drive



This is an electronic storage device and is popularly known as Pen Drive. It is a plug and play device and can be easily connected to the system through USB (Universal Serial Bus) port. That's why, it is also known as USB Flash drive. Because of its small size and reliability, it has replaced the floppy drives and CD drives. Its storage capacity can range from 1GB to 128 GB.



### Blueray Disc



This is a new invention in the field of optical storage devices. Its storage capacity can range from 25 GB to 50 GB. These are also scratch resistant discs and can safely store the data for a long time. As they use blue-violet laser light to store the data, these are named as Blue-ray discs.



Do you know?



To read the data stored on a CD you need to put it into a CD drive. A DVD drive can read data both from a CD as well as a DVD.

## Memory Card



This is a removable flash memory card, also known as Multimedia Card. It is high capacity, high speed storage device generally used in mobiles, cameras, tablets, play stations, etc. Its storage capacity can range from 1 GB to 128 GB.



## External Harddisk



As the name indicates, it is connected to the computer externally. External harddisk is a type of harddisk which is connected to the computer by a USB cable or other means. The capacity of this harddisk is between 40 GB to 5 TB.



Do you know?



The most common example of primary memory is RAM. It is also known as Internal or main memory of the computer. Data in this memory is stored in the form of BITS.

## Info Bits

- The first hard disk drive was the IBM Model 350 Disk file. It was 50-24 inch disc contained inside a cabinet. This huge storage device could store only 5 MB of data.
- A floppy drive is a small storage device. Now a days, these floppy drives are not in use.
- USB stands for Universal Serial Bus.

## Let us Practice

### I. Answer the following questions.

1. What is memory ?

---

---

2. Into how many parts is a computer memory divided ?

---

---

3. Differentiate between harddisk and External harddisk.

---

---

4. Write about pendrive.

---

---

5. Differentiate between DVD and CD.

---

---

6. Explain about Blu-ray Disk.

---

---

7. What is Volatile and non-volatile ?

---

---

### II. Fill in the blanks.

1. Full form of RAM is \_\_\_\_\_

2. ROM stands for \_\_\_\_\_

3. \_\_\_\_\_ is permanently fixed in the computer.

4. BD is known as \_\_\_\_\_

5. Pendrive is known as \_\_\_\_\_



III. Write true (T) for a correct statement and false (F) for an incorrect statement.

1. ROM stands for Read Access Memory.
2. A harddisk is a secondary storage device.
3. RAM stores the data permanently.
4. A DVD is like a pen.
5. BD means Big Disk.

IV. Match the following.

- |         |         |                           |
|---------|---------|---------------------------|
| 1. ROM  | (     ) | a) CD recordable          |
| 2. RAM  | (     ) | b) Digital Versatile Disk |
| 3. CD   | (     ) | c) Random Access Memory   |
| 4. DVD  | (     ) | d) Read Only Memory       |
| 5. CD-R | (     ) | e) Compact Disk           |

## Activity Zone

I. Identify the following devices and write their names.





# Operating System

An operating system (OS) is the most important software that runs on a computer. To use a computer, an operating system is essential. Operating system manages the computer's hardware resources and acts as an interface between the user and the computer.

MS-DOS, Linux, Macintosh and Windows are a few examples of operating systems. Windows is one of the most commonly used operating system. Let's take a look at the journey of windows operating system from the beginning.



## Operating System



Users feed the data by using different input devices (keyboard, mouse etc.). This input data is then passed on to the CPU for processing and the result is stored or it is displayed through the output devices (monitor, printer etc.).



Do you know?



*Interface means common point between two things to ensure smooth working between them.*

An operating system organizes the flow of data to and from the CPU. Once the computer is switched on, the operating system manages software and hardware of the computer. In most of the computers, many different programs run at the same time. To access the programs we need Central Processing Unit (CPU) and storage units. The operating system helps in multiple exchanges of data between the software, hardware and CPU. This multiple exchange of information is known as multi-tasking.

An operating system can have a Command Line Interface (CLI) or a Graphical User Interface (GUI). In CLI, one has to remember all the commands to do a task but in GUI there are icons to select the tasks to be done. MS-DOS is an example of CLI while Windows is an example of GUI.

The most commonly used operating systems are listed below.

### Single user Operating System



It allows only one person to work and operate the system at a time. An example of single-user operating system is DOS (Disk Operating System).

### Multi user Operating System



It allows two or more users to use the computer resources at the same time. WINDOWS and LINUX are two examples of multi-user operating systems.

## Operating systems work on two types of interfaces

### 1. CUI (Character User Interface)



It is a text-based interface which understands only some words and command lines. Keyboard is the main source of input for CUI. MS DOS is an example of CUI

### 2. GUI (Graphical User Interface)



This interface is based on graphical images like pictures and icons. Mouse and keyboard are the main input sources for GUI. Microsoft Windows is an example of GUI.



Operating System	Example
Single User Single Task	MS-DOS
Single User Multi Task	Win'95/98/Me/XP
Multi User Multi Task	Unix, Linux, Windows

### Functions of the Operating System are



- It recognizes the instructions through the input units such as keyboard and mouse etc.
- It sends the output to the monitor and printer etc.
- It allows loading the program such as MS word, MS Excel, movies etc to run.
- Managing the computer resources such as Input/Output devices, CPU time and memory space.
- File Management

### Windows Operating System



The Windows is an operating system which offers many facilities. Windows have been designed by a company called Microsoft Corporation. Hence it is known as MS Windows.

### Features of Windows



Windows is very popular on PCs because of its many features. Let's learn about some of them.

- Windows uses WYSIWYG, which stands for 'What You See Is What You Get'. This suggests that whatever appears on the monitor, the same will be on the printout.
- Windows is called a Graphical User Interface (GUI) based operating system because graphics are used in it to communicate with a computer.
- It is a user-friendly operating system that is easy to handle and operate. We can perform different actions by clicking the mouse buttons.

- Windows uses picture-like icons. We can work on it by just clicking these icons. This feature of Windows makes it easy to work.
- Windows helps us to do many things at a time.
- Windows has a number of programs like Calculator, Paint, WordPad and Notepad.
- We can multi-task in Windows. For example, while playing a game on a computer, we can also listen to songs.

### Windows 10 vs Windows 7




Let's learn about the two versions of windows : Windows 7 & Windows 10.

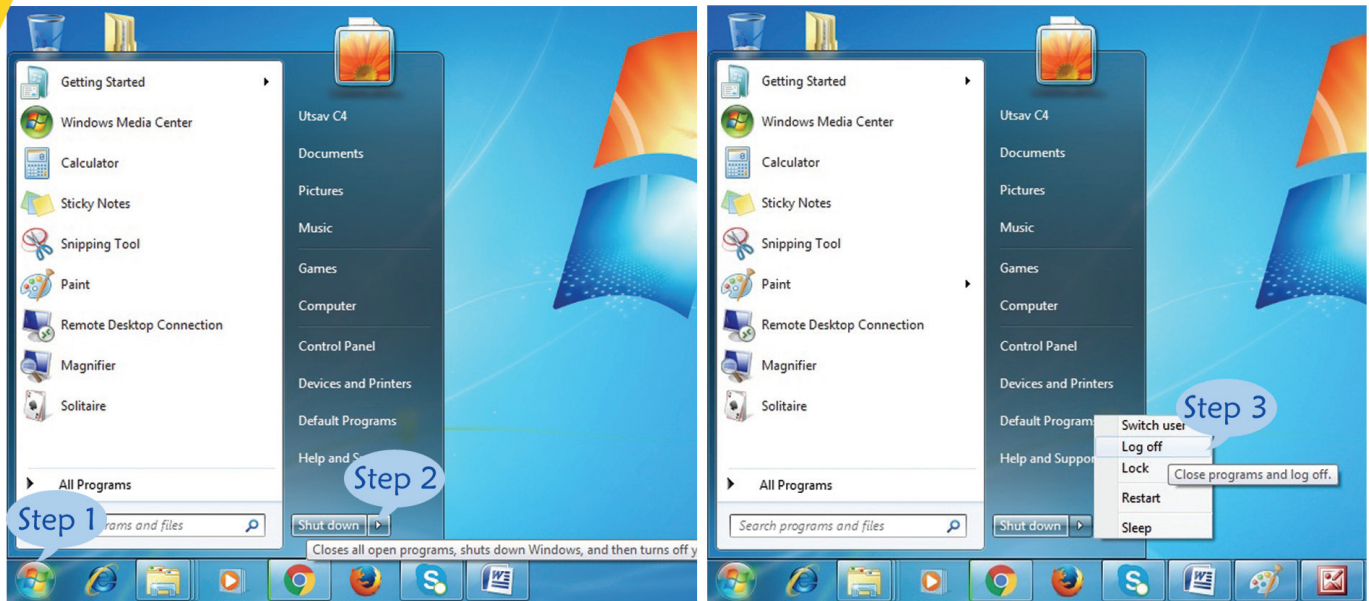
Feature	Windows 10	Windows 7
Shutdown and startup	These processes are very fast in windows 10 that makes it boot quicker.	These processes are very fast in Windows7.
Themes	Windows 10 allows the user to create his/her own themes with a custom desktop background	Themes can be created by the users in Windows 7.
Reliability	Windows 10 is very reliable.	Windows 7 is very reliable.
Security	Windows 10 is the most secure version of Windows.	Windows 7 is more secure than Windows XP.

### Shutting Down in Windows 7



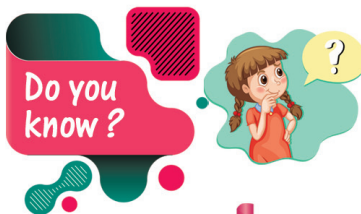
'Turn off computer' is used to shut down the computer. Follow these steps to shut down computer.

- ▶ Click the Start Button.
- ▶ Click on  button.
- ▶ Your computer will be turned off.



‘Log Off’ option closes all programs and prepares computer to be used by someone else. To log off, follow these steps.

- Click the Start Button.
- Click on Log off Computer option, a dialog box appears.
- Click the Log off button.



*The first windows operating system known as Microsoft windows 1.0 came in the market in 1985.*

## Info Bits

- *Operating System is a manager of a computer.*
- *Microsoft windows is the most commonly used operating system.*
- *MS Dos is the most popular operating system chosen for IBM pc. So IBM pc version is called IBM - Dos or PC - Dos*
- *Windows help you to operate the computer.*
- *Booting is a process to load Operating System.*
- *Windows Operating System is a very friendly and easy understand interface.*
- *Alt + F4 can also be used to shut down the computer system.*

## Let us Practice

### I. Answer the following questions.

1. Write a few lines on Operating system.

---

2. Name and explain the different types of the Operating Systems?

---

3. Write any four functions of the Operating System.

---

4. Define the term OS.

---

5. Define the full form of CUI & GUI and give two examples each.

---

6. Write about Windows.

---

7. Write about shutting down windows.

---

### II. Fill in the blanks.

1. CUI stands for \_\_\_\_\_

2. The example of single user single task is \_\_\_\_\_

3. The example of multi user multi tasks operating system is \_\_\_\_\_

4. \_\_\_\_\_ is very reliable.

5. \_\_\_\_\_ located on the leftside of the Taskbar.

### III. Choose the correct answer.

1. Graphical User Interface means ( )

a) IGU

b) IUG

c) GUI

d) IIG



2. Unix is an example of \_\_\_\_\_ operating system. ( )  
 a) Multi user    b) Single user    c) Both A & B    d) None
3. An operating system is an interface between ( )  
 a) User & User    b) User & Computer    c) Computer network    d) None

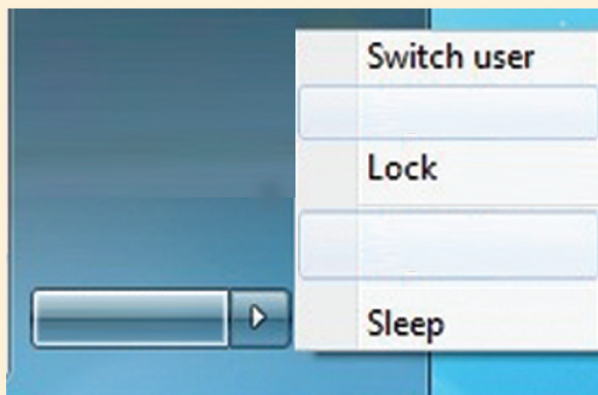
## Activity Zone

I. Mark the words from the following maze related to Operating system.



GUI Multitask Windows UNIX CUI Hardware User LINUX

II. Label the following by using the clues below.



Log Off  
 Restart  
 Shut Down

III. Look at your computer screen and write the name of the icons displayed on it.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_