



# SECONDARY STAGE COMPUTER

BOOK ONE

FOR CLASS IX

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For  
Sindh Textbook Board, Jamshoro.

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## Chapter 1

### INTRODUCTION TO COMPUTER

#### COMPUTER:

Computer is an electronic device that allows the accessing and processing of the huge amount of data into the meaningful information.

OR

Computer is an electronic machine that stores, retrieve and process the information of the data.

#### AGES OF COMPUTER:

There are three ages of the computer. These are as follows.

##### DARK AGE:

In this age all the equipment was manual. The manual machines that were used to process the data are as under.

##### ABACUS:

The Abacus is the old machine to count the numbers. It is known as ancient digital computer. It was the first equipment that was used to make the calculations.

It was developed in china around 3000 BC.

##### NAPIER'S BONES:

A Scottish mathematician designed a device called as napier's bones that was used to calculate the number. It was a set of eleven rods with numbers marked on them in such a way that by placing the rods side by side a person can calculate the products and quotients of large numbers.

##### BLAISE PASCAL:

It was first mechanical calculator, and it can gives the result upto the eight digits.

##### MIDDLE AGES:

The middle age of the data processing are said to age of punch cards.

#### HISTORY OF COMPUTERS:

The MAN IS continuously trying to make the calculations easier.

For this purpose the Chinese made the wooden frame that was called as an abacus. The Neiper's bones for the calculation of the products and the quotients.

In 1671, The LEIBNITZ invented the better calculating device as compared to the pascal that was only used to add or subtract the numbers but this was used to do multiplication or even square roots.

Then the French engineer, Joseph developed the punch card system for the power looms in 1801,  
 In 1948, Howard developed an electromechanical computer called as Mark 1 This is considered to be the first computer because it was used to store the information and instructions.

#### DIFFERENCE BETWEEN FIRST AND SECOND GENERATIONS:

First generation	Second generation
Vacuum tubes were used as the internal components.	Transistor were used as an internal component.
The sizes of computer were very large called mainframes.	The size of computer were smaller than first generation and were called as mini computer.
They were very low speed computer	They are 10 min faster than generation computer.
Main frame was in the form of magnetic tape.	Main frame was in the form of RAM and ROM
Punch card and magnetic tape was used.	Magnetic tape was used.
Machine language was used.	Assembly language was used.

#### DIFFERENCE BETWEEN THIRD AND FORTH GENERATIONS:

Third generation	Forth generation
They used integrated circuit and large scale integration	They used very large scale integration and microprocessor
They were small in size and called as mini computer	They were very small in size and called as micro computer.
They could perform the calculations in nano seconds.	They could perform millions of computer per second.
Main memory is in the form of PROM and DRAM.	Main memory was increased in the form of EPROM and SRAM.

#### TYPES OF COMPUTER:

There are three types of computer

Analogue computer

Digital computer

Hybrid computer

#### ANALOGUE COMPUTER:

Analogue computers deals with continuously varying physical quantities such as current, voltage, temperature e.t.c. They are used for simulating or monitoring and controlling continuous process in industry or scientific research.

The accuracy of data used in analogue computer is directly related to the precision of its measurements.

#### DIGITAL COMPUTER:

Digital computers represent physical quantities with the help of digits or numbers. These numbers are used to perform the arithmetic calculations and also logical

decision making to reach to the conclusion depending on the information that was collected from the user.

### **HYBRID COMPUER:**

This type of computer combines the characteristics of the both the analogue computer and the digital computer. They have speed of analogue computer and the accuracy of the digital computer and they are equipped with the special conversion devices It utilizes the analogue and discrete representation of data. For example the speed of analogue computer and the memory and accuracy of digital computer.

### **DIFFERENCE BETWEEN HARDWARE AND SOFTWARE:**

<b>Hardware</b>	<b>Software</b>
Physical component of computer and the other attached input or output devices are called as hardware	The set of instructions that is stored as a program that govern the operation of a computer system and make the hardware run.
All the hardware component may be connected manually	They are designed by the programmer to fulfill the requirement.
Hardware includes: Input devices Output devices CPU	Software is of two types System software Application software

### **TYPE OF COMPUTER ACCORDING TO THEIR SIZES:**

According to the size of the computer is classified as follows

1. Laptop computer
2. Micro computer
3. Mini computer
4. Super computer
5. Main frame computer

#### **LAPTOP COMPUTER:**

It is the smallest computer in size. It is just look like an office briefcase. They are also called as portable computer. Due to their small size and light weight they become popular among the computer user. They are very useful for the businessman during the travelling. A typical laptop computer have all the facilities just like the micro computer.

The most smallest laptop are called as palm top.

#### **MICRO COMPUTER:**

They are basically very small machines, low in price, easy to operate and they are cheaper and there is no difficulty in their maintenance. The CPU of the micro computer are called as micro processor. The micro computer is called as personal computer because they are designed for the personal use of individual at home or the school small business.

#### **MINI COMPUTER:**

They are more powerful than micro computers. They are very popular in multi user or shared system. In which many user can utilized the single computer by attaching terminals to it. The mini computers may be best choice for medium organization. These computers are used for the scientific and research work.

#### **MAIN FRAME OR MACRO COMPUTER:**

A computer that generally more than a typical mini is often called main frame computer. Commonly main frame computer is connected with more than one CPU or multiple computer are connected with more than one CPU or multiple computer. The system software link that computer together the main frame allows its user to run different program at a time in various development of organization. Such as world wide airlines reservation system.

#### **SUPER COMPUTER:**

They are the most powerful and expensive computers. The calculation needed in scientific research and development areas can be managed without a super computer that is nuclear physics, explosions, experimental oil field, satellite controlling. E.t.c.

#### **GENERATIONS OF COMPUTER:**

##### **FIRST GENERATION OF COMPUTER:**

It Was started in 1946 and lasted in 1956. It was based on the vacuum tubes. The vacuum tubes are about the size of the 100 watt light bulb and used as an internal component.

In this generation the input and the output devices are punch card that were used for data storing purpose and very slow devices. The computer were operated manually and the language was low language (symbolic language) with binary code that require high programming skill. ENJAC, EDVAC, UNIVAC and MARK 1 were some of the major inventions of this generation.

##### **ADVANTAGES OF THE FIRST GENERATION:**

Vacuum tubes were used as electronic component.  
Electronic digital computers were developed for the first time.  
These computers were the fastest calculating devices for their time.  
Computations were performed in milliseconds.

##### **DISADVANTAGES OF FIRST GENERATION:**

Too large in size  
They were unreliable  
Induce a large amount of heat due to the vacuum tubes  
Frequent hardware problem that required constant maintenance  
Not portable  
Limited commercial use

##### **SECOND GENERATION:**

The period of this generation 1959 to 1964. During this period transistor were used for internal logic circuit of computer. These computer were execute 200,000 instructions per second.

The input/ output devices became much faster by the use of magnetic tape. During this period the low level language were used. However the high level language such as FORTRAN and COBOL were used. The problem of heat maintenance was solved and size of the computer was also reduced. The major inventions was IBM 1400 series, IBM 1600 series, UNWACIII, NCR300 e.t.c

**ADVANTAGES OF SECOND GENERATION:**

Smaller in size as compare to the 1<sup>st</sup> generation  
Much more reliable  
Less heat generated  
Computation were perform in micro second  
Less hardware and maintenance problem  
Could be used for commercial use

**DISADVANTAGES OF SECOND GENERATION:**

Very costly for commercial  
It still required frequent maintenance  
Frequent cooling also required

**THIRD GENERATION:**

In this generation the integrated circuit (IC) were used. An integrated circuit contains many electronic components on a single chip. The disk oriented system was used made at the end of this generation. The size of the computer became very small with better performance and reliability. High level programming language was extensively used.

The faster input/ output devices made possible multi processing and multi programming. Where by a number of input terminals could be run virtually at the same time on a single centrally located computer. The famous computers were IBM 360, IBM 370 and UNIVAC 9000 series e.t.c.

**ADVANTAGES OF THIRD GENERATION:**

Small in size as compared to second generation  
More reliable  
Portable  
Less electricity consumption  
Heat generation were rare  
General purpose computer

**DISADVANTAGES OF THIRD GENERATION:**

Air conditioning was required in many cases due to ICs.  
Very advance technology was required to make ICs

**FOURTH GENERATION:**

The integrated circuit were more developed and called small scale integration. After some time SSI were developed and termed as large scale integration. There was a great versatility of input/ output devices. In 1971, a powerful microprocessor chip INTEL 8008 was introduced. The first micro processor which is used in personal computers was INTEL 8080. The 8 inch floppy disk was also introduced in 1971, while hard disk was introduced in 1973.

**ADVANTAGES OF FOURTH GENERATION:**

No cooling system required in many cases  
Smaller in size and much reliable  
Much faster computation  
Portable and cheaper  
The heat generated was negligible  
Totally general purpose computers

#### **DISADVANTAGES OF FORTH GENERATION:**

Very advanced technology was required to fabricate to the ICs

#### **FIFTH GENERATION:**

This generation is started in 1981 and is still it is continued; new technologies are adopted to fabricate IC chips, such as electron beam, X rays or laser rays. The very large scale integration was developed so the computer become much smaller then ever before.

New memory storage like bubble memory, optical or memory are being designed. The new computer will be controlled by using human voice and will work by giving command in our own language. Future computer will in some way to be intelligent and capable of making decision.

#### **ADVANTGES OF FIFTH GENERATION:**

Very large story capacity  
Long bit processor build  
Artificial intelligence language developed.

#### **ADVANTAGES OF COMPUTER:**

##### **SPEED:**

A computer can process data faster than any other machine designed to perform a similar task.

##### **REPITITION:**

A computer can tirelessly perform the same operations millions of time in exactly the same way without getting bored and tired the way, a human clerk would.

##### **ACCURACY:**

A computer's high speed processing is accomplished by high accuracy result. No other system can have as much as accuracy as a computer system.

##### **LOGICAL OPERATION:**

The Computer can make decisions based on some conditions and takes alternative course of action accordingly.

##### **STORE AND RECALL INFORMATION:**

The computer is like a human brain as it can store fact, instructions and information and recall them when needed.

##### **DIFFERENCES BETWEEN ANALOGUE AND DIGITAL COMPUTER:**



Analogue computer	Digital computer
Represent data continuously.	Represent data discretely.
Transmission means of transmission of analoge signal without regard to their content.	Transmission concerned with content of signal.
Signal type continuously vary electromagnetic wave.	Signal types sequence of voltage pulses overtime.
Application measurement of different physical quantity, scientific applications.	Applications- business, science and home

### PROGRAMMING LANGUAGES OF COMPUTER:

#### PROGRAMMING LANGUAGE:

It is a type of software. A program is a set of step by step instructions that direct the computer to do the task you want it to do and produce the desired the result. A set or rules that provide a way of telling a computer when operation to perform is called as programming language.

#### MACHINE LANGUAGE:

A machine language is a basic language that was used to perform the basic task of the computers. It is also called as binary language because it is the language of 0s and 1s.

Each machine language statement corresponds to the machine action.

An operation that requires one machine language instruction in one computer may require several instructions in one computer may require several instructions in another computer. Each computer has its own unique machine language.

#### HIGH LEVEL LANGUAGE:

This language is closer to the human understandable language. It includes statement like GOTO and PRINT that are common words.

Unlike the assembly language the program of the do not require to write it for any particular computer but it can be execute at any machine that has a compiler for that machine.

#### ADVANTAGES OF INTERNET:

It gives information about every field of life.

You may take advantages from encyclopedias and dictionaries with the help of internet.

You may get information according to the need through internet.

It gives the coordination with whole world and its interest.

Its helps to exchange the views with the person of same mental attitude

Internet brings the world closer

Current happening incident can be discovered by the use of internet.

Any kind of topic related with politic, fashion, science can be discovered by the use of internet.

#### DRAWBACKS OF INTERNET:

1. The student wastes their precious hours on sitting on internet without taking any positive or constructive benefit.
2. Most of the people using the internet satisfy their negative desire.
3. Adult material is easily accessible on the internet.
4. Computer hacking is very common by the use of internet some extreme minded people can digest the money through the use of credit cards.

**COMPILER:**

Compiler is a translator that translates high level source into low level object. It translates the complete program at once and gives the error list that are required to be removed from the program.

**INTERPRETER:**

Interpreter is a translator program which converts source program into object and it translates one instruction at a time.

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## Chapter 2

# COMPUTER COMPONENTS

### CPU:

CPU stands for central processing unit. It is the brain of the computer. It is based on the tiny silicon chip. This chip have millions of the switches and the paths that are used to make the decision. The CPU has following main sections

- Control Unit
- Arithmetic/Logic Unit
- Memory unit
- Registers

### CONTROL UNIT:

All the computer resources are managed by the control unit. It works like a traffic cop directing the flow of data between the components of the CPU and to and other form of devices. The CU of the CPU comprises of the registers that functions as temporary storage devices. The bits of information that have been taken from the main memory and those that will be placed in the main memory are temporarily help in the registers.

### ARITHMETIC LOGIC UNIT:

It is the main part of CPU that helps the CPU to perform the mathematical operations like addition, multiplication, subtractions. It is the part of computer where the logical comparisons can be done. The ALU performs the basic functions on the data and received on the primary storage based on the instructions from the control unit.

### REGISTERS:

The registers are the special storage area built into processor to access the data at very high speed. It also helps to operate and perform the task of the CPU. And we know that there are 14 registers in the microprocessor.

### MEMORY UNIT:

Memory unit is the place where computer program and data restored during processing. It is the area through which is input into or output of the CPU must pass. It is mentioned by CU that keeps the track of everything in the storage. It is a random access device.

It has two types

1. Random Access memory (RAM)
2. Read only memory (ROM)

### RANDOM ACCESS MOMORY:

It is the temporary memory. The memory locations can be accessed randomly. RAM is a volatile memory that means that when ever the computer switch off the data on the computer will be lost and we can not retrieve that data again.

This memory performs the arithmetic and logical operations. It has large memory.

### READ ONLY MEMORY:

It is the permanent memory. Its content of this memory can not be changed because it is read only memory you can not write on it. It is a non volatile memory that means that when ever the computer is switched on you can not lost your data.

### SECONDRY STORAGE:

The secondary storage or the memory is used to backing up the data and to enhance the capacity of the main memory.

It is also called as mass storage or auxiliary storage.

It has following types

Magnetic tape

Magnetic disk

### PORTS:

A port is a socket at the back of the computer that is used to plug in various devices. The personal computers have different types of the ports. Internally there are several ports for connecting disk drives, Display controllers and keyboard.

Externally computers have ports for connecting modems, printer, scanner and other peripheral devices.

There are two types of ports.

Serial port	Parallel port
A serial port provides a connection for transmitting data one bit at a time	A parallel port provides a connection for transmitting data eight bits at a time over a cable with eight separate data lines
It has slow data transmission due to the travelling of one bit at a time.	Parallel transmission is fast because eight bits travel simultaneously.
It is also called as a male connector. It has 9 or 25 pins.	It is also called as a female connector. It has 9 or 25 holes.
A serial port connects your computer to a device such as modem, which requires two-way data transmission, or to a device such as a mouse, which requires only one-way data transmission.	The cable that connects two parallel ports contains 25 wires, eight wires carry data and the remaining wires carry control signals that help to maintain orderly transmission and reception.
Serial ports can be name as COM1, COM2 and so on	Parallel ports can be name as LPT1, LPT2 etc

**INTERNAL VS EXTERNAL MEMORY:**

S.#	Internal memory	External memory
1	Internal memory is a working memory.	External memory is not a working memory.
2	It consists of media only.	It consists of media and device.
3	It is volatile in nature in case of RAM but ROM is non volatile.	It is non volatile in nature.
4	Internal memory is also known as primary storage or main memory.	External memory is also known as secondary, Auxiliary or backing storage.
5	Examples are RAM and ROM.	Examples are hard disk, floppy disk, Magnetic tape, cassette etc.

**BUSSES:**

A processor communicate with input/output circuits and memory by using signals. These signals travel along the set of wires or connections called bus that connect the different component together.

There are three types of signals address bus, control bus and the data bus.

**ADDRESS BUS:**

Connections between the CPU and memory which transmit the address from which the CPU will read OR to which the CPU will write, OR A collection of wires connecting the CPU with the main memory that is used to identify particular locations in main memory where data is stored.

**CONTROL BUS:**

It is a physical connection that carry control information between the CPU and the other devices within the computer. The control bus carries signals that report the status of various devices.

**DATA BUS:**

It is a communicating route through which the data can travel between the computer's central processing unit, memory and peripherals.

## Chapter 3

### INPUT AND OUTPUT DEVICES

#### INPUT DEVICES:

Those devices that are used to input the data or to give the instructions to the computer are called as input devices.

#### Examples

Keyboard  
Mouse  
Joystick

#### OUTPUT DEVICES:

The devices that are used to express or show the result of given input are called as output devices.

#### Examples:

Monitor  
Printer  
Speaker

#### KEYBOARD:

It is an input device that is so commonly used to input or write different facts and figures into the computer system. It is just like a typewriter.

#### CLASSIFICATION OF KEYS:

We can classify the keys of keyboard into the following different categories

Numeric keypad  
Alphanumeric keypad  
Screen Navigation keys  
Functional keys  
Modifier keys

#### NUMERIC KEYPAD:

Numeric keypad is placed at the right hand side in a keyboard. It consists of the mathematical digits and some other logical operators like + - \* /. A decimal point is also included in numeric keyboard.

#### ALPHANUMERIC KEYPAD:

Alphanumeric keypad is placed in the mid of the keyboard. It consists of A-Z English alphabets and 0-9 mathematical digits. This keypad is so commonly used to work on Microsoft office.

#### Screen navigation keys:

Screen navigation keys are used to highlight the different files and the folders on the screen. It is commonly used in the absence of the mouse.

#### FUNCTIONAL KEYS:

Functional keys are placed at the top of the keyboard. It consists of 12 different keys which are used for very special purpose. The functions of every key is totally depend on the software.

Like F1, F2, F3.....F12

### **MODIFIER KEYS:**

Modifier keys are used for the special purpose. Modifier keys are placed adjacent to the alphanumeric keys. Modifier keys are used with other keys to complete the desire actions.

### **MOUSE:**

It is an input device that is used to move the cursor on the screen. It consists of two different buttons and a ball and laser light technology.

The right hand side button is used to open a menu bar to utilize the different option. The left hand side button is used to open files and folders.

### **MONITOR:**

Monitor is an output device that is used to show the in the form of softcopy. It is just like a televisions screen that is used to show the result either in text form or in graphics.

### **TYPES OF MONITORS:**

We can classify into two categories.

By size

By color display

### **BY SIZE:**

The monitor is divided into further two categories in form of size.

Liquid crystal display

Cathode ray tube

### **LIQUID CRYSTAL DISPLAY:**

It is the one of the type of monitor that is used to show the display by the help of electrolyte liquid crystal. It is easily portable.

### **CATHODE RAY TUBE:**

It is one of the types of monitor that shows the result by the help of picture tube. The size of the monitor is very large as compared to the L.C.D

### **BY COLOUR DISPLAY:**

According TO THE Color display we can subdivided into three different types.

### **MONO CHROME MONITORS:**

It is the one of the type of monitor that shows the result one for the background and other for the foreground.

**GREY SCALE MONITORS:**

Grey scale monitor shows the result with different shades of grey. It is also referred as the black and white monitor.

**COLOUR MONITOR:**

A color monitor shows the result with different colors which are formed by three different colors (red, green, blue) it also referred as RGB monitor.

**PRINTER:**

Printer is an output device that is used to show the result in the form of hard copy.

**CLASSIFICATION OF PRINTERS:**

We can classify a printer into following categories.

Impact printer

Non impact printer

**IMPACT PRINTER:**

All those printers that work with the help of ink ribbon are included in impact printer. We can further sub divided the impact printer into following types.

**DAISY WHEEL PRINTERS:**

It is just similar to a type writer. This type of printer has a plastic or metal wheel on which the shape of each character is stand out. A hammer presses the wheel against the ribbon and then print on a paper sheet. A daisy wheel prints alphabet and digit but can't print any picture or graphics.

**DOT MATRIC PRINTER:**

It is the one of the type of the printer that creates a character by striking the pins against the ink ribbon. Each pin makes a dot and the combination of different dot makes a character.

**LINE PRINTER:**

It is one of the type of printer that print the entire line at a time. As compare to the daisy wheel and dot matrix printer line printer is very fast but produce low quality prints.

**NON IMPACT PRINTER:**

We can sub divided the non impact printer into the following types.

**THERMAL PRINTERS:**



Thermal printer works with heated pins against the paper. It is commonly used in the tele-fax machine.

**INK-JET PRINTERS:**

Ink-jet printer work with ink spray and it produce high quality of text and graphics but consume huge quantity of ink.

**LASER PRINTER:**

It is the one of the type of printer that works with the laser light technology. It is just like a photo state machine. The speed of laser printer is very fast as compare to the other types of the printers.

**SCANNER:**

Scanner is an input device that converts a hardcopy into softcopy. We can classify a scanner into three different types.

- Handheld scanner
- Flatbed scanner
- Sheet-fed scanner

**HANDHELD SCANNER:**

Handheld scanner can easily portable or moveable in used. It scans the specified material depend upon the programming. It is so commonly used in banking sector and some other field of work. The scope of handheld scanner is limited.

**FLATBED SCANNER:**

It is one of the types of the scanner that consist of the flat piece of the glass. A hard copy of the document put on the glass to scan it and convert it into soft copy.

**SHEET-FED SCANNER:**

This type of scanner is used in very specialized filed of work. The object is placed on a sheet and the laser light is used to scan the whole object. It is commonly used in the medical center.

## Chapter 4

### STORAGE DEVICES

#### PRIMARY MEMORY:

Primary memory referred to the storage device or a capacity that must be required to operate a computer system. It is also referred as main memory of computer system.

Example RAM, ROM

#### SECONDRY MEMORY:

Secondary memory refers to the storage capacity or devices which increase the utility to computer system secondary storage devices can be easily portable as compare to the primary memory.

Example: Floppy disk, USB

#### RAM:

RAM stands for random access memory. It is one of the types of primary memory. That must be requiring performing the operational activities. By the way of increasing storage capacity of RAM the speed of computer can also be increased. RAM is a volatile memory it means that the data stored in RAM can be lost in the absence of electricity.

#### TYPES OF RAM:

The RAM can be classifying into two different types.

1. Dynamic RAM
2. Static RAM

#### DYNAMIC RAM:

It is the one of the type of RAM that must be need to be refreshed thousands of time in a second. It is cheapest in price as compare to the static RAM.

#### STATIC RAM:

The type of the RAM that does not need to be refreshed is called as static RAM. It makes the work faster. . But it is also more expensive as compare to the dynamic RAM.

Both type of the RAM are volatile in nature it means that the data will be lost if the power turned off.

#### ROM:

ROM stands for read only memory. That permits you only to read data. It is a type of primary memory. That is permanent in characteristics means ROM always retains the data it holds even when the computer is turned off. That's why it is called non-volatile memory.

It is a pre-programmed memory and it is responsible to start up the computer and perform diagnostics. It has special programs called firmware for this purpose stored in it.

There are several types of ROM.

1. PROM (Programmable read only memory)
2. EPROM (Erasable programmable read only memory)
3. EEPROM (Electrically erasable programmable read only memory)

**PROM (Programmable read only memory):**

PROM stands for Programmable read only memory. A PROM is a memory chip on which you can store a program but once the PROM has been used you can not clean it, use it to store something else. Like ROM PROM are non-volatile.

**EPROM (Erasable programmable read only memory):**

EPROM stands for Erasable programmable read only memory. An EPROM is a special type of PROM that can be erased by exposing it. So program or data written in EPROM chip can be change and new data can also be add even the EPROM is in use.

**EEPROM (Electrically erasable programmable read only memory):**

An EEPROM is a special type of PROM that can be erased by exposing it to an electric charge. Like EPROM, after erasing data you can reuse it.

**SIMM:**

SIMM stands for Single in line memory module. It is a module containing one or several random access RAM chip on small circuit board with PINS that connect to the computer motherboard.

The more RAM chips you can add to the computer the faster it operates and the more programs you can run at the same time. In today's computer chips are usually grouped together on small circuit board.

The more RAM your computer has the less frequently it will need to access your secondary storage. Like hard disk or CD-ROM.

**DIMM:**

DIMM stands for dual in line memory module is a double of SIMM. Like SIMM it is a module containing one or several random access memory chips on small circuit board with pins that connect it to the computer motherboard.

The memory chips on a SIMM are typically dynamic RAM (DRAM) chips while an improved form of RAM called synchronous DRAM (SDRAM) can also be used.

**UNITS OF MEMORY:**

Each byte is the combination of the eight small units called bits (binary digit). Each bit is capable to store either 0 or 1. The smallest unit of the memory is bit, but the smallest accessible unit is byte because we can store single character of information in a byte not in a bit. A group of four bits is called as nibble but memory of computer is expressed in bytes.

**SECONDARY MEMORY STORAGE:**

The secondary storage devices provides the large quantities of the data to process for the longer time periods. Secondary storage is called as auxiliary storage. That is used to store large quantities of data for longer period of time that is not currently being processed. It is non volatile.

The auxiliary storage is used to store the input data programs and the output processing results.

**FLOPPY DISKETTE:**

It is a small removable, portable storage device that is made up of polyester film coated with metal oxide compound. It looks like a 45 rpm phonograph.

It is readable by a computer with a floppy disk drive. The physical size of disk has shrunk from the early 8 inch, to 5.25 inch square and about one millimeter.

These disks are also known as floppies because the disk is flexible. 3.5 inch floppies are less floppy than the larger disk because they come in stiff plastic envelop or case.

**HARD DISK:**

A hard drive is a magnetic disk on which you can store computer data. The term hard is used to distinguish it from a soft, floppy or a disk. Hard disk can store more data as compare to the floppy. But they are less portable. We can but portable hard disk. Today's computers come with the hard disk having several billion bytes of storage.

**CD ROM:**

CD-ROM is an abbreviation of the compact disk read only memory. It is designed to store the computer data in the form of text and graphics. It is non volatile memory storage device. It is popular for the distribution of large data bases, software and especially multimedia applications. CD ROM drives are rated with a speed factor relative to music CDs.

CD-ROM drives can also read audio compact discs for music although plays cannot read CD-ROM discs.

The CD-ROM, like other CD adaptations, has data encoded in a spiral track beginning at the center and ending at the outer most edge of the disc.

**MAGNETIC TAPE:**

A magnetic tape is a storage device from which you can access data serially like an audio cassette from which you can hear the songs in the order in which they are stored. Serial access is slower than direct access provided by media such as diskettes. When you want to access some particular data from the tappe, the device has to scan through all the data you do not need but that data is stored before the required one.

Business especially might do a backup of the day's transaction every day or a backup of the whole system once a week, for instance.

The tape is divided into logical blocks. As a floppy is divided into tracks and sectors. One file could take up many logical blocks, but must take up many logical blocks. But must take up one whole block at least. So, smaller blocks would result in more room for data.

Advantages of magnetic tape:

It is the cheapest magnetic media used today, it is normally used to storage of large files.

It can conveniently be stored because data remain un changed unless altered by an external magnetic field.

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## Chapter 5

### DATA REPRESENTATION

#### DATA:

Data is any collection of facts or figures. The data is a raw material to be processed by a computer

Data is divided into two types

Numeric data

Character data

#### NUMERIC DATA:

The numeric data consists of the 0-9 digits, a decimal point and some other logical operation. By the help of numeric data, the number of mathematical techniques can easily be applied.

We can further easily classify the numeric data into different types.

Integer data

Real data

#### INTEGER DATA:

The integer data consists of 0-9 mathematical digits. The fractional data does not include in integer data.

Examples

Number of students in class

Passenger in a bus

#### REAL DATA:

The real data consists on 0-9 mathematical digits with a decimal point. The result shows in fraction is referred as the real data.

The real data is further classified into two different types.

Fix point data

Floating point data

#### FIX POINT DATA:

Fix point data consist on the mathematical digits with a decimal point. The fix point includes only the non-imaginary data.

For example:

Height of a student

Temperature in a room

#### FLOATING POINT DATA:

Floating point data consists on a decimal point with the main characteristic of imaginary values.

For example

Values use in scientific research  
Calculation perform in medical science

### **CHARACTER DATA:**

Character data consists on mathematical digits, English alphabets and different pictures animation.

String Data  
Graphical Data

### **STRING DATA:**

String data includes the different mathematical operation and English alphabet. It can further can be classified into two different types.

Alphabetic data  
Alpha numeric data

### **ALPHABATIC DATA:**

The alphabetic data consists on different English alphabetic is so commonly.

Name of the student  
Name of the country

### **ALPHANUMERIC DATA:**

Alpha numeric data consist on English alpha numeric and alphabetic digit.  
Example  
The complete address of the houses  
The number plate of a car

### **GRAPHICAL DATA:**

The graphical data consists on different pictures and videos animation.  
Example  
Bar diagram  
Pie chart  
Maps

### **INFORMATION:**

The uniform, organized and meaningful form of data is called as information.

For example  
A mark sheet  
A utility bill  
A printed cheque

### **NUMBER SYSTEM:**

The system of counting and calculation is called as number system. Following are the four different number system that are used in computer language

Decimal  
Binary

Octal  
Hexadecimal

**DECIMAL:**

Dec is the Latin word that is used for the mathematics that is 10. It consists on ten different including 0 to 9.

**BINARY:**

Bi is the Latin word that is used for the internal working of the computer. Its bas is 2. It consists of two number including 0 to 1.

**OCTAL:**

Oct is a Latin word that is used for 8. Octal has eight fundamental digits from 0 to 7.

**HEXADECIMAL:**

Hexa dec is a Latin word that is used for 16. It has 16 fundamental digits. It consists of the 0-9 mathematical and A-F in English alphabets.

**DECIMAL TO BINARY:**

$$(76)_{10} = ()_2 ?$$

Solution:

2	76
2	38-----0
2	19-----0
2	9-----1
2	8-----1
2	4-----0
2	2-----0
2	1-----0

1001100

$$(1789)_{10} = ()_2 ?$$

2	1789
2	894-----1
2	447-----0
2	223-----1
2	111-----1
2	55-----1
2	27 -----1
2	13-----1
2	6-----1
2	3-----0
2	1-----1



1011111101

$(1011)_2 = ()_{10} ?$

Solution:

$(1011)_2 = ()_{10} ?$

$$1 * 2^3 + 0 * 2^2 + 1 * 2^1 + 1 * 2^0$$

$$8 + 0 + 2 + 1$$

11

$(100110)_2 = ()_{10} ?$

$$1 * 2^5 + 0 * 2^4 + 0 * 2^3 + 1 * 2^2 + 1 * 2^1 + 1 * 2^0$$

$$0 * 32 + 0 * 16 + 0 * 8 + 1 * 4 + 1 * 2 + 0 * 1$$

$$32 + 0 + 0 + 4 + 2 + 1$$

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## Chapter 6

### BOOLEAN ALGEBRA

#### BOOLEAN ALGEBRA:

The term Boolean algebra is a convenient and systematic way of expressing and analyzing the operations of logical circuits.

#### BOOLEAN ALGEBRA TERMS:

There are the following terms that are used in the Boolean algebra.

#### BOOLEAN CONSTANT:

Boolean algebra uses binary values 0 and 1 as Boolean constants.

#### BOOLEAN VARIABLE:

The variable used in the Boolean algebra are represented by letters such as A, B, C, x, y, z with each variable having one of two and only two distinct possible values 1 and 0.

#### BOOLEAN COMPLEMENT:

The complement is the inverse of a variable and it is indicated by a bar over the variable.

#### BOOLEAN EXPRESSIONS:

Boolean expression is an arrangement of different variable and logical operators used to express the operation of logic circuit.

Examples:

$$ABC + ABC\bar{D} + A\bar{B}CD$$

Where as A, B, C, D are the variables and the + sign is the logical operator.

#### BOOLEAN FUNCTION:

Boolean function is also a Boolean expression that is form with different variables, logical operators including AND and OR with a specified signature. That is "=". In Boolean function compliment are also used which are denoted as "NOT".

Examples

$$\overline{AB} = \bar{A} + \bar{B}$$

#### TRUTH TABLE:

The truth table is a systematic listing of the values for the dependent variable in terms of all the possible values of independent variable. It can also be defined as a table representing the condition of input and output circuit involving two or more variable.

**LOGICAL OPERATORS:**

Following are the different logical operators which are used in Boolean functions.

1. OR
2. AND
3. NOT

**OR OPERATOR:**

OR operator is represented by the + sign. It is used for the logical addition or the Boolean sum. The + symbol or the OR operation is used by listing all possible combinations of, for example A and B and the resulting value C in the equation.

$$A+B=C$$

A	B	A+B
0	0	0
0	1	1
1	1	1
1	0	1

**AND OPERATOR:**

AND operator is represented by a "." sign. It is used for the logical multiplication.

Examples:

A	B	AxB
0	0	0
0	1	0
1	0	0
1	1	1

**NOT operator:**

NOT operator is represented by (-) sign. It is used for the logical inverse.

Example If A and B are the variables.

Then

A	B	$\bar{A}$	$\bar{B}$
0	0	1	1
0	1	1	0
1	0	0	1
1	1	0	0

**DEMORGANS THEOREM:**

Demorgan is a mathematician who introduce two different important terms. That becomes the important part of the Boolean algebra. They help in simplifying the complicated logical expressions.

The Demorgans theorem is

$$\overline{X + Y} = \overline{XY}$$

$$\overline{XY} = \overline{X} + \overline{Y}$$

### LAW OF BOOLEAN ALGEBRA:

Following are three different basic laws of the Boolean algebra.

- Commutative law
- Associative law
- Distributive law

### COMMUTATIVE LAW:

The commutative law states that the order in which the variable are ANDed or ORed malar difference. The commutative law of addition and mutplication are as under.

For examples

$$A+B=B+A$$

$$A.B=B.A$$

### ASSOCIATIVE LAW:

The associative law states that the addition and multiplication of more than two variables makes same result regardless of the grouping of the variables.

For example

$$A+ (B+C) = (A+B) +C$$

### DISTRIBUTIVE LAW:

This law states that when ORing two or more variables and then ANDing the result with a single variable is equivalent to ANDing the single variable with each of the two or more variable then ORing the products.

$$AB+AC=A(B+C)$$

### RULES OF BOOLEAN ALGEBRA:

#### RULE NO 1:

$$A+0=A$$

A variable ORed with 0 is always equal to the variable.

Proof

We can prove it as

$$\text{For } A = 0$$

$$\text{L.H.S} = 0+0$$

$$\text{L.H.S} = 0$$

$$\text{L.H.S} = A(\text{R.H.S})$$

**RULE NO 2:**

A variable ORed with 1 is always equal to 1

Proof

We can prove it as

For  $A = 0$

L.H.S =  $0 + 1$

L.H.S = 1

L.H.S = R.H.S

For  $A = 1$

L.H.S =  $1 + 1 = 1$

**RULE NO 3:**

$A \cdot 0 = 0$

A variable ANDed with 0 is always equal to 0.

**RULE NO 4:**

$A \cdot 1 = A$

A variable ANDed with 1 always equal to the variable

**RULE NO 5:**

$A + A = A$

A variable ORed with itself is always equal to the variable.

**RULE NO 6:**

$A \cdot A = A$

A variable ANDed with itself is always equal to the variable.

**RULE NO 7:**

$A + \bar{A} = 1$

A variable ORed with its complement is always equal to 1

**RULES NO 8:**

$A \cdot \bar{A} = 0$

A variable ANDed with its complement is always equal to 0

**RULE NO 9:**

$\bar{\bar{A}} = A$

The double complement of a variable is always equal to the variable.

**RULE NO 10:**

$$A + A.B = A$$

This rule can be proved by applying the distributive law.

**KARNAUGH MAPS:**

The Karnaugh map is a type of map that provides the systematic method to simplify the Boolean expressions and if properly used will produce the simplest SOP or POS possible expression.

There are two main standard forms of the Boolean expression.

The Sum of Product (SOP)

The Product of sum (POS)

**THE SUM OF PRODUCT:**

When the two or more than two products terms are summed by addition the resulting expression is termed as sum of product.

**THE PRODUCT OF SUM:**

When two or more than two terms are multiplied then the resulting expressions are called as product of sum.

## Chapter 7

# COMPUTER SOFTWARE

### SOFTWARE:

The computer plan that is organized in the step by step instructions that direct the computer what to do is called as software.

### TYPES OF SOFTWARE:

There are two types of software

#### SYSTEM SOFTWARE:

The type of software that directly related to the computer hardware and perform the tasks associated with the controlling and utilizing the computer hardware are called as system software.

There are following examples of the system software

Operating system  
Language translator

#### OPERATING SOFTWARE:

The set of programs that control and supervise the hardware of a computer and provide the services to the application software, programmers and users of the computer.

The operating system manages the CPU, printer disk drives and running user programs.

#### LANGUAGE TRANSLATOR:

The computer does not understand the programming language. Because computer only knows the machine language or binary language. A program must be translated into machine language before the machine can execute it.

#### DATA-MANAGEMENT SOFTWARE:

This Software is used to organize, update and print the data.

#### EDITORS:

This software enables the user to type in a program or generate text and make modification whenever necessary.

#### UTILITY SOFTWARE:

The type of the programs that are used to perform the wide range on the functions like virus cleaning.

#### APPLICATION SOFTWARE:

An application is a job or task a user wants to accomplish through a computer. Application software are programs that helps the user to perform specific job.

#### TYPES OF APPLICATIONS SOFTWARE:

General purpose application  
Special purpose software

### **GENERAL PURPOSE APPLICATION SOFTWARE:**

These are called packaged software or commercial software. A single software can be applied to a wide variety of task. For example

Ms Office  
Adobe Photoshop

### **SPECIAL PURPOSE APPLICATION SOFTWARE:**

The software is designed to perform a specific task is known as special purpose application software. This is also called as custom software.

For example  
Software to maintain bank account  
Software used in Airline booking system

### **DOS:**

DOS stands for disk operating system A disk operating system stored data on a floppy disk or hard disk. It also manages the routine work of computer system. Controlling everything from the internal memory, monitor displays, keyboard input and external communication.

DOS has remained one of the popular operating system for IBM and IBM compatible personal computers for a long time. The process of loading the operating system into the memory is called as bootstrapping.

### **FILES:**

We store all of our work and program into the storage devices that is called as filing.

DOS has the naming convention for all the files.

### **NAMING THE FILES:**

Each file contains a file name. It has two parts and the name and the extension.

A file can have a name up to the eight characters but its extensions must be limited to three characters to identify the type of the file.

For example  
Myfile.txt

In this the name of the file is my file and its extensions is txt

It is a good approach to not to use the following type of extensions because the DOS use these extensions itself.

BAT, BIN, COM, CRF, EXE, LST, MAP, OBJ, SYS



Do not use the space or any other following symbol.

. " / \ { } : < > + - = ; , ? \* space

### **WILD CARD CHARACTERS:**

When you are looking for a particular file using the DIR command to see the directory or DEL command to delete the files then you can use the two special characters that are called as wildcard characters.

A question mark can take a place of any single character and an asterisk can replace any group of characters even the entire file name or extension

### **DOS COMMANDS:**

The command is the way of the communication and it is used to perform the specific tasks. There are two types of command

Internal command

External command

### **INTERNAL COMMAND:**

The internal commands are built into the DOS and loaded with the DOS when the computer is getting started. These commands are immediately available in memory and can not be seen in the disk files list.

The internal commands are as follows

COPY

VER

DEL

CLS

DIR

CD

PATH

MD

PROMPT

REN

TYPE

TIME

### **EXTERNAL COMMAND:**

The external commands are the types of the commands that are stored on the disk. DOS must read these commands from the disk before you can execute them.

Some commands are

FORMAT

DOSKEY

DELTREE

XCOPY

SYS

PRINT

DISKCOPY

LABEL

CHKDSK

### **COMMANDS:**

For the commands see book page number 127

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## Chapter 8

### INTRODUCTION TO WINDOWS OPERATING SYSTEM

#### WINDOW OPERATING SYSTEM:

Window is a graphical user interface based operating system. In DOS we have type in commands but in windows commands are located on screen in the form of icons.

There are different versions and flavors of windows for example windows 95, windows 98, windows 2000

#### DIFFERENCE BETWEEN WINDOW OPERATING SYSTEM AND DOS:

WINDOW	DOS
Window has the GUI that is called as graphical user interface.	DOS has Command line interface.
It is controlled by the clicking the pictures on the screen.	In DOS instructions are typed through commands.
It is a multiuser operating system.	DOS is a instructions user operating system.
It enables us to copy or move the data from one program to another.	It does not support the feature of the clipboard.
It is multitasking and can do more than one task in a same time	It is not multi tasking.

#### DESKTOP:

Desktop is like a working surface of a desk. Desktop is where your applications, folders and shortcuts are located.

It contains the following items.

Icons

Task bar

Start button

#### ICONS:

An icon is a small colorful graphical picture that represents an object like a file, folder, program or any hardware component of the computer. Every icon has a label, which identifies it. the label can be changed.

Windows operating system uses different icons to represent files, folders and applications. Icons found on the desktop are normally left aligned.

The icons that are provided by the windows are

My documents

My computer

Recycle bin

Internet explorer

My network places

**TASK BAR:**

The bottom line at the desktop is called as taskbar. But you can easily move it to the top or either side of the screen by clicking and dragging it to the new location. Buttons representing programs currently running on your computer appears on the task bar.

The above taskbar shows that two programs are running on the computer. At the very left of the taskbar is the start button at the right side is an area called the system tray.

**WINDOW:**

Window is a rectangular area of screen that displays different information. In windows every folder or application has a window. Following are the properties of a window.

- Every window has a title bar, which display the name of the window.
- A window can be resized, minimized, maximized, by pressing the buttons at the top right corner of the title bar.
- A window can be closed by pressing the x button at the right of the title bar.
- A window can be move at any location of the screen.

**START BUTTON:**

Start button is found at the lower left corner of the screen. Click once on the start button to open a menu of choices. Through this button we can open the programs installed on your computer and access all the utilities available in the windows environment.

We can shutdown, restart and stand by the computer using the start button.

**PROGRAMS:**

Place the mouse pointer to the programs entry and a submenu will open, showing all programs or applications currently installed. To open a program, which has been installed on your computer, click on it and the programs will open.

**FAVORITTES:**

This menu presents a list of the internet address that you have added to your internet explorer favorites list.

**DOCUMENT:**

The documents menu lists the files you have recently worked on. You can open the most recently used document worked on.

**SETTING:**

This menu provides the facility to change or configure the hardware or software settings of the computer. This may leads to several choices.

**CONTROL PANEL:**

The individual icons in the control panel refer to a variety of tools to control the way your computer. Its components present information, as well as the tools to control the behavior and appearance of the windows interface.

**PRINTER:**

This Option allows you to access the printers that are available on your computer.

**TASKBAR AND START MENU:**

The taskbar and start menu gives you another way to set taskbar options and to add or remove items from the start menu.

**FOLDER OPTION:**

This also gives you another way to set folder options. How the folder should behave.

**ACTIVE DESKTOP:**

A quick way to turn on and off the active desktop

**WINDOWS UPDATES:**

An internet connection to windows operating system upgrades and fixes.

**SHUTDOWN:**

Shutdown is a process in which computer closes all the programs currently running and disconnect the devices connected with it and turns itself off.

**ICONS OF THE DESKTOP:****MY COMPUTER:**

My computer lets you access the content of the computer. The common tasks that we can perform through my computer are:

1. Access the information stored as different storage devices connected with the computer, such as hard disk, floppy disk or CD ROM.
2. Create, move, delete or rename files and folders and programs from one disk to another disk.
3. Execute or run programs from the disks.
4. Configure devices of the computer
5. Add or remove a printer

**MY DOCUMENTS:**

My documents is a desktop folder that provides a convenient place to store documents, graphics, or other files that you want to access quickly. On the desktop it is represented by a folder with a sheet of paper in it. When you save a file in a program the file is saved in the My Documents by default unless you choose a different location.

**MY NETWORK PLACES:**

Network is a group of computer that are connected with each other to share data, information and resources of computer with each other. Resources like printer, CD ROM and software can be shared with other users on a network.

**RECYCLE BIN:**

It is used to delete and undelete the files. When a file or folder is deleted from any location it can be restored by using the recycle bin.

**STEPS TO MOVE A FILE TO THE RECYCLE BIN:**

Click on the file or folder you want to delete  
Click the right button of the mouse  
A dialogue box will appear  
Select the delete option from it.  
Window will ask the confirmation message to confirm the delete of the files.  
Click on the yes button  
File successfully deleted.

**DISPLAY:**

It is used to change the display setting of the monitor. It has a number of tabs that changes sets the display properties of the monitor screen.

**WALLPAPER/BACKGROUND:**

Close or minimize all the open files or the programs.  
Click the right mouse button on the screen.  
A menu will appear, choose the option properties  
Display properties dialog box will appear.  
Click on the background tab select the desired wallpaper icon  
Click on the apply button  
Click ok button  
Your wall paper will be automatically changed.

**APPLYING SCREEN SAVER:**

Right CLICK on the blank area of the desktop.  
A new menu bar will be appeared on the screen.  
Select the option of the properties  
A new window will be appeared on the screen.  
Select the tab on the screen saver.  
Select the desired screen saver.  
Click on the apply button  
Click ok button  
Your screen saver will be changed.

**WINDOWS EXPLORER:**

Windows explorer provides another way to view the content to the disk and its folders in a tree like structure. We can navigate between the files and the folders through explorer.

Follow the following steps to open the window s explorer  
Click on the start menu and select the programs from that menu  
From the programs submenu select Accessories.  
From Accessories submenu click on the window explorer.

**CREATING A FOLDER:**

Following are the different steps must be following right click on the blank area of desktop.

A new menu bar will be appeared on the screen.

Then a new sub menu bar will be appeared on the screen.

Then click on the older option.

Then click on the blank area

A new folder will be appeared on the screen

**COMPUTER VIRUS:**

A computer virus is a hidden program which can infect other programs by modifying them and causes data loss. It attaches itself to other programs and execute secretly every time and the host program is executed. The virus replicates itself with in the computer system.

Some viruses are hidden in the computer at a particular time called time bomb virus.

**FUNCTINS OF THE VIRUSES:**

1. It infects the other programs.
2. It destroy the data on disks
3. It spreads from one disk to another
4. Some times it makes the computer unusable.

**ANTI VIRUS:**

Anti virus is a type of software that is used to remove the virus program from the disk. Anti virus software have been developed to get rid of the computer virus that can destroy the valuable data and causes the computer to malfunction.

Some of the anti virus programs are

Norton anti virus

MacAfee

PC clean

AVG