NETAJI SUBHAS OPEN UNIVERSITY

NETAJI SUBHAS OPEN UNIVERSITY

STUDY MATERIAL

M. COM.

PAPER-20

Computer Applications in Business

POST GRADUATE
COMMERCE

PREFACE

In the curricular structure introduced by this University for students of Post-Graduate degree programme, the opportunity to pursue Post-Graduate course in Subject introduced by this University is equally available to all learners. Instead of being guided by any presumption about ability level, it would perhaps stand to reason if receptivity of a learner is judged in the course of the learning process. That would be entirely in keeping with the objectives of open education which does not believe in artificial differentiation.

Keeping this in view, study materials of the Post-Graduate level in different subjects are being prepared on the basis of a well laid-out syllabus. The course structure combines the best elements in the approved syllabi of Central and State Universities in respective subjects. It has been so designed as to be upgradable with the addition of new information as well as results of fresh thinking and analysis.

The accepted methodology of distance education has been followed in the preparation of these study materials. Co-operation in every form of experienced scholars is indispensable for a work of this kind. We, therefore, owe an enormous debt of gratitude to everyone whose tireless efforts went into the writing, editing and devising of proper lay-out of the meterials. Practically speaking, their role amounts to an involvement in invisible teaching. For, whoever makes use of these study materials would virtually derive the benefit of learning under their collective care without each being seen by the other.

The more a learner would seriously pursue these study materials the easier it will be for him or her to reach out to larger horizons of a subject. Care has also been taken to make the language lucid and presentation attractive so that they may be rated as quality self-learning materials. If anything remains still obscure or difficult to follow, arrangements are there to come to terms with them through the counselling sessions regularly available at the network of study centres set up by the University.

Needless to add, a great part of these efforts is still experimental–in fact, pioneering in certain areas. Naturally, there is every possibility of some lapse or deficiency here and there. However, these to admit of rectification and further improvement in due course. On the whole, therefore, these study materials are expected to evoke wider appreciation the more they receive serious attention of all concerned.

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NETAJI SUBHAS OPEN UNIVERSITY

Post-Graduate : Commerce
M. Com-20

Module 1

Module 2

Unit 1 ❑ Computer Hardware

Structure

1.1 Computerized Information System

To understand 'computerized information system', one should understand the concepts of 'System', 'Information' and 'Information System' separately

System- A system is an entity, consisting of three or more interrelated parts or subsystems that work together to achieve a goal. Every system, whether it is a biological, social or mechanical system, has three main subsystems-input, processing and output.

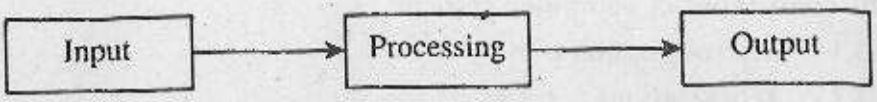

Figure 1.1- Three subsystems of a system

Most common example of a mechanical system is the Constant Voltage Transformer (CVT). It continuously receives the input voltage (including high & low), processes it is the transformer and gives constant voltage as output.

Information is the processed data, which is organized and also meaningful & useful for the users. 'Data' are raw facts collected randomly and can be used as input to an information system for processing.

Information system involves collection and entry of data, processing of the data and storing & reporting of the information received as an output. Information system may be manual, mechanical or computerized.

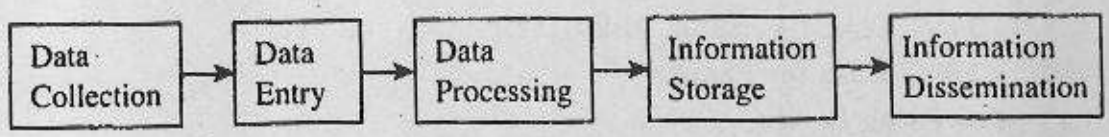

Figure 1.2- Information System

Computerized information system- When a computer is used for data processing, then the system is called computerized information system. A computerized information system is much superior to other types of information system. It is because of its special characteristics namely, speed, accuracy, versatility, memory capacity etc.

1.2 Different Types of Computer Systems

There are *four* broad categories of computer systems which are discussed below:

1.2.1 Microcomputers

These computers are built with microprocessors. Where the processor/CPU (Central Processing Unit) consists of a single IC (Integrated Circuit) chip, it is called

microprocessor. Microcomputers are also called Personal Computers (PCs). Since only one person can use such machine at a time, it is called personal computer. In other words these computers do not allow sharing of the system. Desktop, Laptop and Palmtop computers come in this category.

Desktop PCs are most popular amongst the PCs. These PCs are put on tables. Its peripherals are a long keyboard, a monitor and a tower-box containing CPU, Motherboard, Power supplier, Hard disk drive, Compact disk drive, Floppy disk drive etc. A Printer and a mouse are also fitted with the computer. Most of the desktops are either IBM PCs or IBM compatibles. Other type is the Apple Macintosh PCs. Desktops use Operating System or System software (like Windows), which acts as a middleman between the hardware and the application software (like Oracle). Speed of a desktop depends on the capacity of its peripherals like CPU, Memory, Hard disk etc.

Laptop PCs (or Notebook computers), of late, have become very popular. They look like briefcases and are portable. It is the miniature version of a desktop PC. Laptops run with batteries and uses LCD (Liquid Crystal Display) monitors, which are flat type screen. Normally a person uses laptop when he is travelling. While on move, wireless internet connectivity to laptops is possible through WiFi (Wireless Fidelity) devices. Since peripherals are compact in a laptop, it is usually costlier than desktops.

Palmtop PCs can be held in palms. With the advent of VLSI (Very Large Scale Integration) of transistors, it has become possible to design PCs that can be held in a palm. There is a facility for handwritten inputs by electronic pen on the screen. Separate version of system software is available for use in palmtops. It is also available in combination with mobile phone, Fax etc. However it is not suitable for bulk business work.

In future, the size of a computer will go on reducing. Scientists claim that they have become successful in reducing the size of a transistor to that of the size of a molecule. It is, of course, a great development in nanotechnology, a science that aims to reduce computers and other devices to minuscule sizes. This will enable faster computation and also saving in power consumption.

1.2.2 Workstations

It looks like a personal computer and generally used by one person. But these are very powerful desktop machines, CPU speed approximately ten times powerful than a PC. It differs from a microcomputer on the ground that its CPU architecture is

based on RISC (Reduced Instruction Set Computing) and it uses Unix as the Operating System. Where complex computations are required, it is done with the help of workstations. For example- simulation of a complex model etc. Generally these computers are used as server in a LAN (Local Area Network). Enhanced graphic facility is also available in workstations.

1.2.3 Mainframes/Mini Computer

These computers are much bigger and faster than workstations. Where large numbers of transactions are required to be processed simultaneously from terminals located at different places, this type of computer is most suitable. For example - railway reservation, airlines reservation, bank, insurance companies etc. Only a few companies manufacture mainframe computers. Amongst them IBM mainframes are popular. Special type of operating systems is used in mainframes. For example- VAX/VMS, AS400 etc. There are many advantages of mainframe computers over the computers mentioned in the preceding paragraphs, but at the same time these are very costly and maintenance cost is also high. That is why many users are now replacing mainframes with workstations. A smaller version of the mainframe computer is called **mini computer**.

1.2.4 Supercomputers

Supercomputers are fastest amongst all the computers. These are very powerful and at the same time very expensive. These are normally used in complex scientific research/model building. For example- weather forecasting, supersonic aircraft designing, nuclear reactor, astronomical research, precision war arsenals etc. These computers are designed by interconnecting a number of powerful computers and programmed in such a way that these will act coherently. These computers are based on the technology of parallel computing. PARAM series of supercomputers are India's self-developed supercomputers.

1.3 Input Devices

Computer system has separate devices for input, processing, storage and output. Brief discussion on these devices has been made in the forthcoming paragraphs.

Primary Data Input Devices consists of Key Board & Monitor, Magnetic Ink Character Reader (MICR), Scanner (Optical Character Recognition), OMR (Optical Mark Reading and Recognition), Bar Code Reader, Speech Recorder etc. Secondary Data Input Devices consists of Floppy Disk, Compact Disk etc.

1.3.1 Keyboard & Monitor

The Keyboard & the Monitor in combination help to feed data directly into the computer. The computer keyboard is just like a typewriter keyboard with some additional features. The monitors are made of CRTs (Cathode Ray Tubes). It looks like a television screen. Whenever we type something through the keyboard, it is immediately displayed on the monitor. A cursor guides the user about the position of the data to be entered. Since the entered data is displayed on the monitor, it can be easily edited according to requirement. These data can be permanently saved in any disk we like. Editing and saving are done with the help of key/software menu.

1.3.2Magnetic Ink Character Reader (MICR)

Instead of using ordinary ink for writing human readable characters, magnetic ink is used to print characters in some documents, as in case of cheques. Cheque number, branch code etc. are normally printed with magnetic ink. A device called Magnetic Ink Character Reader, can read these data from a cheque when this cheque is fed into the device. MICR can be connected to a computer. This method is very helpful to process cheques in clearing houses. Thus no human effort is required to enter data manually through keyboard. Simultaneously accuracy also is ensured in data entry.

1.3.3 Scanner (Optical Character Recognition)

Data, in the form of a printed page or a hand written page or a picture, can be photocopied into a computer through this device. When these items are placed on the flat glass plate of a scanner, it converts these either as (i) an image or (ii) a document that can be edited in a word processor. There is separate software for these two options. Everything can be converted into images, but only a printed page with standard type fonts can be converted into a word processor editable page.

Any item (whether printed character/handwritten character or picture) is at first converted into 400 (or more) dots per inch. It is called pixel (picture element). Each dot is then converted into bits (binary digits i.e. 0 & 1). It is called bit map. 4 bits & 24 bits representation is used for each dot, depending on the colour of the item to be scanned.

In case of a printed page, if we want it to be word processor editable, the bit map is converted into ASCII representation of characters with the help of a recognition-software. These characters are word processor editable. This recognition-software can recognize bit map of standard type fonts only.

1.3.4 Optical Mark Reader (OMR)

Marking with pen or dark pencil can be recognized by this device. These marks must be put in a standard preprinted form. When these forms are fed into the OMR, the marks on the forms are transcribed into electrical pulses, which are recognized by the computer. Thus no keyboard data entry is required to feed data from these forms. This device is very much helpful to evaluate objective type answer books with multiple-choice answers, to analyze answered questionnaires etc. with the help of a computer.

1.3.5 Voice Recognition Devices

With the help of these devices like microphone, headset etc. (backed by software), one can enter data just by giving dictation to the computer. For accuracy the software needs to be trained for a few days for a particular type of voice. However, accuracy level of data input through this mode is not same as that of through keyboard. Some editing is required. Still it saves lot of labour, which is required in case of keyboard entry.

1.3.6 Floppy Disk

Data already in electronic form and contained in a floppy disk, can be entered into any computer as input. A floppy disk is circular in shape and 3.5 inches in diameter. This disk is packaged in a 3.5 square-inches hard plastic envelope, with a slit for read-write head access to the disk and a whole in the center for disk drive hub. The disk drive has mechanism to hold the envelope and rotate the disk inside the envelope at high speed. Normal capacity is 1.44 Mega Bytes (MB). Since there are provision for both read and write, the disk can be used both as input and output device.

1.3.7Compact Disk (CD)/Laser Disk

Like floppy disk, electronic data contained in a CD, can be entered into any computer as input. It is also circular in shape, the diameter being 4.75/ 3 inches. Unlike floppy disk, a CD is not put in an envelope. Generally it is made of shiny metal and is kept open. However plastic CDs are also available. Its capacity is very high (generally 700 MB). It is also called laser disk because laser technology is used to read and write the disk. CD drives are of two types- CD-ROM (Read Only

Memory) drive and CD writer. A CD-ROM drive can only read from a CD. On the other hand, a CD writer has the facility both for reading and writing. Therefore a CD can be used both as input and output device.

1.3.8 Digital Versatile Disk (DVD)

A DVD is similar to CD. However, in DVD laser beam of smaller wavelength is used. As a result data can be stored in more than one layer on a particular side of the disk. Naturally storage capacity of a DVD is enhanced to a great extent (generally 8.5 GB or 8500 MB in two layer of one side).

1.3.9 Flash (or Pen) Drive

Flash drive is a removable memory slot, which is made of flash memory chips. These chips are to some extent similar to static RAM (cache memory) chips. However this memory is not volatile like static RAM. It looks like a flat marker pen. No disk is used here and therefore no read /write head is required. Its capacity is quite high in comparison to floppy disk (generally 128/256 MB). Data saved in it is easily erasable like a floppy disk. It is much faster and more reliable than a floppy disk. For these reasons, it is becoming a popular as an input/output device. However, it is costly in comparison to floppy disk/ compact disk.

1.4 Processing Device

Data processing is done by the **Central Processing Unit** (CPU). It is also called processor, which is brain of the computer. A CPU contains- Arithmetic Logic Unit (ALU), Registers, Control Unit and Internal (or Level 1) Cache Memory. Actual processing of data and issuance of instructions are done by ALU. Data and instructions are received from primary storage (RAM) and/or secondary storage via registers (high speed memory locations). Intermediate results are sent back to registers and after completion of processing results are sent to primary/secondary storage.

Control unit is the central nervous system of a computer. All activities of a computer are directed by the Control unit. It manages and coordinates the entire computer system. All activities will paralyse if this unit breaks down. Internal cache memory is high speed supplementary to RAM. RAM speed is very slow in comparison to CPU speed. Therefore to alleviate the speed mismatch, the CPU itself contains a cache memory, which acts as buffer. CPU is fitted on the Mother Board.

1.5 Storage Devices

The devices where data, instructions & information are stored are called storage devices. Data and instructions entered into the computer have to be stored before processing. After processing also information has to be stored. There are two types of storage devices- primary and secondary.

1.5.1 Primary Storage Devices

Random Access Memory (RAM) is a primary storage device. There are two types of RAM- Dynamic RAM (popularly known as RAM) and Static RAM (or external cache memory). (i) In *Dynamic RAM*, we can randomly read from and write into the memory. It is called dynamic because data stored in it disappears after a few milliseconds. Therefore data must be refreshed repeatedly before it disappears. However it is cheaper and power consumption is less. It is also called main memory, temporary memory, volatile memory etc. RAM is activated with the booting of the computer by transferring necessary files of system software. When we open particular application software, necessary files of that software also are transferred to RAM. When we enter data, open an existing data-file or give instruction, these are also stored in the RAM. Therefore the RAM plays a very important role before and after processing. Its speed in terms of CPU access time is high in comparison to secondary storages but very slow in comparison to CPU speed. (ii) To over come the problem of speed mismatch, *Static RAM* is used. Static RAM is known as external cache memory or level-2 cache memory. Unlike Dynamic RAM, it need not be refreshed repeatedly to preserve data; it can hold data till power is on. It acts as an interface between the CPU and DRAM. This memory is very fast but at the same time very costly and power consumption is high. It may be mentioned here that level-1 cache memory is inbuilt on CPU cheap.

Read Only Memory (ROM) is also a primary memory. BIOS (Basic Input Output System) is written permanently in ROM. BIOS is a system software which supplements the main system software. When power is turned on, BIOS performs Power On Self Test (POST) by comparing with the information contained in CMOS. This test checks whether all the designated devices are in place. If found OK, a single beep sound is given. Then it transfers the system software into the main memory. BIOS perform many other low level services, which are not provided by the main system software. The information contained in ROM may be read out but fresh information cannot be written into it. However in case of EPROM (Erasable Programmable ROM), fresh programs may be written into it.

Complementary Metal Oxide Semiconductor (CMOS) Memory is used to store time, date and system set up information. This information is loaded every time the computer is booted and shown on computer screen before coming to the desktop. For changing standard set up, option is given immediately after power is turned on. CMOS is powered by a battery so that the time clock runs even when the computer is turned off.

Registers are special type memory units used by CPU to store information temporarily, while processing of data is performed by it. Example of registers are- Memory Address Register, Memory Buffer Register, Program Control Register, Accumulator Register, Instruction Register, Input/Output Register etc.

1.5.2 Secondary Storage Devices

Primary storage device is small in size and also volatile. Therefore, for permanent storage of data/information, secondary storage devices are used. They can hold huge volume of data. Examples of secondary storage devices are- Floppy Disk, Compact Disk, Digital Versatile Disk, Pen Drive, Hard Disk etc. We have already discussed about Floppy Disk, Compact Disk, Digital Versatile Disk and Pen Drive in the preceding paragraphs. Now we will discuss about Hard Disk.

Hard disk is fitted with the computer system and not detachable from the disk drive. It is also called Winchester disk. A set of disks is mounted on a spindle one below the other. Then these disks are permanently packed in a sealed container. A read/write head is fitted which can access data randomly from the disk set. Winchester disks are fast and reliable but price is comparatively low. Storage capacity of this disk is very very high (say 60 GB, 80 GB etc.). This disk can also be used as output device.

1.6 Output Devices

Output may be in electronic form, in printed form or in audio-visual form.

1.6.1Electronic Devices

All secondary storage devices can be used as output devices. After data processing is over, information can be transferred to Floppy Disk, Compact Disk, Digital Versatile Disk, Pen Drive, Hard Disk, Microfilm etc. We have already discussed about these devices, except Microfilm, in the preceding paragraphs. Now let us discuss Microfilm. **Microfilm** is used to store massive data in a compact form.

A camera is used to photograph output from the monitor. A 35 mm film is used for photography. A microfilm reader is used to read the output. Microfilming is very expensive; therefore its use is very limited.

1.6.2Printing Devices

Printers are very popular and are used to get hard copies of the computer output. Printers are generally classified into two categories- impact printers and non-impact printers. Drum printers, Daisy wheel printers, Line printers, Dot-matrix printers are categorized as impact printers. Impact printers function on the technology of typewriters i.e. hammering a typeface against a paper through an inked ribbon. On the other hand non-impact printers use thermal, electrostatic, chemical and inkjet technologies. We will discuss only those printers that are used commonly.

Dot-matrix Printer is an impact printer. The print head consists of a matrix of pins (say 9 x 6) and moves across the line. It prints one character at a time in the pattern of dots, by following the shape of the character. The memory sends one character at a time to the printer. The printer activates the appropriate pins in the print head for striking on the paper through the ribbon. Normally these printers are bi-directional, i.e. they print from left to right in one line and right to left in the next line. This helps to increase the speed. Multiple copies can be made by using carbon papers. This printer is noisy, comparatively slow and printing quality is also not so good. But these are still in use due to their cost effectiveness.

Ink-Jet Printer is a non-impact printer. It has a Jet like nozzle with small holes that sprays ink-dots on the paper to form characters. Ink cartridge, filled with special type of ink, is used in the printer. Coloured-ink-cartridge is also used. The ink is electrically charged which results ejection of ink-dots. The print head moves on a high speed and characters with any shape can be printed by the print head. As a result printing is done at high speed with letter quality printing. Printing quality depends on dot per inch (dpi). Higher the dpi better is the quality. However, ink-jet printing is very costly because of the high cost of the cartridge. Moreover multiple copies cannot be produced by using carbon papers in a single printing.

Laser Printer is based on laser beam and photocopying technology. The laser beam traces the characters from the file to be printed, on a photoconductive drum. Thus an electrostatic image of the whole page is formed. The ink toner is attracted to the electrostatic image. Then the image is transferred to the paper and the entire page is printed at a time. Different types of fonts are provided by the manufacturer in the printer driver. Its speed is 4 to 17 pages per minute with 600/1200 dpi. The

initial cost of the machine and the recurring cost of ink toner is high but per page cost is lower than that of ink-jet printing.

Plotter is another type of printer. It is not used to print texts rather it is generally used to plot drawings and graphs. Instead of a print head, a pen is fixed with the carriage. This pen in one hand can move left to right and on the other hand can move up and down. A computer program controls the movement of the pen according to requirement. Where constant monitoring of movement any thing is necessary, plotter becomes very helpful.

1.6.3 Audio visual Devices

A **speech output device** is one, which can read characters from a computer memory and can convert them into spoken words. This facility is now being used widely. In India, railway reservation status can be enquired with the help of interactive voice response system, which uses this device. This device can also help blind persons to hear readout from books stored in computers.

If music composed with the help of a computer program, the output can be heard with the help of **amplifier boxes**. These are fitted externally with the computer backed by sound cards inside the computer. At present almost all the computers are provided with this device.

Sometimes output is only displayed in a **monitor.** The monitor type may be Cathode Ray Tube (CRT), Liquid Crystal Display (LCD) or Plasma Display. The display system is widely used in airports, railway stations, hospitals etc.

1.7 Communication Devices

Computers can, not only process data and produce information but also can communicate information very efficiently at real time to another computer, if they are connected in a network. For this purpose devices used are Local Area Network (LAN), Wide Area Network (WAN), International Network (Internet) etc. Computers can communicate with mobile phones also, in the form of Short Message Service (SMS), Multimedia Message Service (MMS), E-mail etc.

For detail discussion on networking, please refer unit 3.

1.8 Questions

1) Discuss about 'system', 'information system' and the role of a computer in information system.

2) "All computer systems are not similar"- Explain.

3) What is computer hardware? Name the different types of computer hardware and also mention their functions.

4) Discuss in detail about input and output devices of a computer.

5) Explain CPU and its function. Which devices comprise memory of a computer? Explain briefly.

6) Explain the following terms:

   a) Data and information

   b) Laser Disk

   c) DVD

   d) Workstations

   e) Ink Jet printer

   f) RAM

   g) MICR

   h) Scanner Structure

Unit 2 ❑ Personal Computers

Structure

2.1 What is Personal Computer?

As discussed in unit 1, computers that can be used by only one person at a time are called Personal Computers (PCs) or Microcomputers. In other words these computers do not allow sharing of the system. Since these computers use microprocessors, they are called Microcomputers. Microprocessor is that type of processor in which the entire circuit of the CPU is built on a *single* silicon chip. Desktop, Laptop and Palmtop computers are examples of Personal Computers. Detail discussion on these has been made in unit 1.

IBM coined the term 'personal computer' when it named its microcomputer as IBM PC in 1981. Subsequently all other manufacturers (except Apple Macintosh) claimed that their microcomputers are IBM PC compatibles. Therefore, the whole family of original PCs and compatible PCs came to be known as Personal Computers. Majority of the computers we see in offices, shops and homes are Personal Computers. It may be noted that Apple Macintosh microcomputers are not IBM compatible.

2.2 Main Components

Components of a typical personal computer consist of—

a) Circuit board called mother board;

b) CPU or Microprocessor and CPU clock;

c) Memory consisting of (i) Dynamic RAM (or RAM) (ii) Static RAM (or Level 2 cache) (iii) Internal cache (or Level 1 cache) (iv) ROM and (v) CMOS;

d) Hard disk drive;

e) Floppy disk drive;

f) Compact disk drive;

g) Switch Mode Power Supply (SMPS) unit;

h) Keyboard;

i) Monitor;

j) Mouse;

k) Printer;

There are other optional peripherals such as Scanner, Flash drive, Multimedia etc. Moreover, system software and application software are also essential to make a PC fully operational.

2.2.1 Mother Board

Motherboard is the main board, which contains some components and a plethora of circuits. To be precise, it contains—

a) Slots for components;

b) Connectors;

c) Ports; and

d) Bus.

a) It contains a number of **slots**. These are - (i) Processor slot to hold CPU, (ii) SIMM/DIMM (Single/Dual Inline Memory Module) slot to hold dynamic RAM card, (iii) BIOS (Basic Input Output System) slot to house BIOS or ROM, (iv) CMOS memory slot to house the CMOS memory (also called battery backed RAM), (v) PCI (Peripheral Component Interconnect) expansion slots to hold sound card, internal modem etc., (vi) AGP (Accelerated Graphics Port) expansion slot to hold graphics accelerator card, and (vii) Other expansion slots to hold other expansion cards, like video adapter, LAN card, Fax card, Bar code reader card, coprocessor card, etc.

b) **Connectors** on the motherboard help to connect various devices, which are located off the motherboard but inside the cabinet. Cables are used for the connection. The connectors are- (i) IDE (Integrated Drive Electronic) drive connectors- meant for connecting hard disk drive and CD drive, (ii) Floppy drive connector- used for connecting floppy disk drive to the motherboard, (iii) Power supply connector - allows to connect the SMPS.

c) **Ports** are used to connect external devices with the motherboard, which are provided at the back of the cabinet. Ports are of three types- Serial, Parallel and USB. (i) Through serial ports data travel serially bit by bit, but communication works

both ways. Keyboard, mouse, monitor, external modem etc. are fitted with serial ports. (ii) Through parallel ports, data travel in parallel comprising 8 bits/16 bits etc. (equal to 1-byte/2 bytes etc.). However, communication is *one way*. Dot matrix printers, speakers etc. are fitted with parallel ports. (iii) USB (Universal Serial Bus) ports provide higher data transfer rate and are suitable for connecting- printers (other than dot matrix), scanner, pen drive, digital camera etc.

d) **Bus** is tiny rows of wires on the motherboard. These wires can carry a group of bits in parallel. Bus capacity can be 8 bits, 16 bits, 32 bits, and so on keeping consistency with the bit capacity of CPU. With the help bus, the CPU communicates with the memory and all the peripherals & components of a computer, connected through slots, connectors and ports. There are three types of bus- Data bus, Control bus and Memory address bus. Through data bus, data is transmitted; through control bus, control is exercised on the peripherals; and through memory address bus, address of memory location is transmitted.

2.2.2 CPU or Microprocessor

A discussion on composition of CPU has been made in unit 1. Now let us trace the historical development of the microprocessor. Dr. Ted Hoff of Intel Corporation invented the first microprocessor (i.e. single-chip processor) in 1969. Thereafter the evolution of benchmarked microprocessors is like this:

Year	Single-chip processor by Intel	Transistors in the single cheap	Internal architecture	CPU Clock Speed at the starting
1971	4004	2300	4 bits	740 KHz.
1972	8008	3500	8 bits	800 KHz.
1974	8080	6000	8 bits	2 MHz.
1976	8085	6500	8 bits	5 MHz.
1978	8086/8088	29000	16 bits	10 MHz.
1982	80286	134000	16 bits	12.5 MHz.
1985	80386	275000	32 bits	16 MHz.
1989	80486	1.2 million	32 bits	25 MHz.
1993	Pentium	3.1 million	32 bits	50 MHz.
1997	Pentium II	7.5 million	32 bits	233 MHz.
1999	Pentium III	9.5 million	32 bits	450 MHz.
2000	Pentium-4	42 million	32 bits	1.4 GHz.
2005	Pentium 4D (Dual-core)	230 million	32 bits*	2.8 GHz.

* Extended Memory 64 Technology (EM64T).

All the abovementioned microprocessors are generally used in desktop PCs. For laptop PCs, Intel's Pentium M (Centrino) is now being used widely. Intel's processors for servers/workstations/supercomputers were/are- iAPX 432 (32-bit), i960 (32-bit), i860 (RISC 32-bit), Xeon (32-bit), Itanium (64-bit) etc.

CPU Clock is an important component of CPU. CPU speed depends on the speed of the clock. Clock speed is measured in terms of hertz (One hertz = one cycle of electromagnetic wave in one second). For example- presently Pentium 4 processor's speed is 3GHz. Simply it means that the processor can process $3x10^9$ instructions per second. The higher the clock-speed faster is the processor. Speed of level-1 cache is also equals to clock speed. However speed of level-2 cache is comparatively slow. To solve this problem presently level-2 cache is also placed inside the processor cartridge.

2.2.3 Switch Mode Power Supply (SMPS)

This device regulates power supply to the computer. It receives 220-volt power and converts it according to the requirements of different devices (e.g. 5 volts to the processor. It supplies power to the monitor, to the motherboard, to the disk drives and to the exhaust fan inside the SMPS. The exhaust fan (PC fan) drives out hot air and dust from inside of the computer.

Note-Discussion on other components has been made in unit 1. Students are requested to refer the same.

2.3 Factors Influencing PC Performance

Technology and capacity of almost all PC components has some bearing on PC performance. However, the following factors have major influence on PC performance-

a) Microprocessor's, clock speed, scale of transistor integration, and data width;

b) Technological superiority of bus & chipset of the Motherboard;

c) Quality and Capacity of DRAM, Registers & Cache memory;

d) Capacity of Hard Disk;

e) Quality of System software.

Discussion on hardware has already been made. System software will be discussed in a subsequent unit.

2.4 PC as Virtual Office

In a *real (or brick & mortar) office* there may be a stenographer to draft letters, assistants to maintain files and send & receive mails/Fax, cashier to maintain cash, accountants to maintain accounts, a statistician for statistical calculation, draftsman to draw design and so on. All these jobs and many other jobs can be done very efficiently in quickest possible time with the help of a Personal Computer. All we have to do is to load appropriate application software in to the PC. If a person is conversant with all the application software, he can alone perform the entire jobs single handedly. That is why Personal Computer is called a *virtual office*.

2.5 Questions

1. What is a personal computer? How will you relate a personal computer with microcomputer?
2. What are the different components of a microcomputer? What are their functions?
3. Write a brief essay on microprocessor.
4. Write a brief essay on motherboard.
5. What are the factors that influence the function of a PC? How a PC is a virtual office?
6. Explain the following terms:
   a. Bus;
   b. CPU clock;
   c. Level 1 and level 2 cache;
   d. SMPS;
   e. Ports.

Unit 3 ❑ Modern Information Technology

Structure

3.1 Introduction

A stand-alone computer can perform many tasks for us. Not only performance of tasks, but it can also communicate with other computers if connected appropriately. It is a great advantage that computers offer. The computerized communication technology has made a paradigm shift in the information system and now we can send or receive information to or from any person sitting anywhere in the world just by a few mouse clicks. Now let us discuss computer networking.

3.2 Computer Network

When two or more computers are connected together through cable line or wireless mode, it is called computer network. It is linked by hardware but managed by software. For networking, it is not necessary that there shall be more than one stand-alone computer. Sometimes one main computer is networked with numerous terminals located at different places. Networking not only facilitates exchange of information but also enables sharing of resources like devices, software, files etc. Mainly following types of computer networks are found :

a) Local Area Network (LAN)
b) Metropolitan Area Network (MAN)
c) Wide Area Network (WAN)
d) International Network (Internet)
e) Intranet
f) Extranet
g) Value Added Network (VAN)

3.2.1 Local Area Network (LAN)

From the name itself it is clear that it is limited to computers situated within a local area, say within a building or adjacent buildings. Normally in an office, each computer user has to share information generated by others. Not only that, expenditure on resources like printers, software etc. can be reduced to a great extent if these are shared online. Therefore Local Area Network is of great use in an office. With the introduction of PCs in the early 1980s, more and more LANs have been built up with the passage of time. LAN architecture may be of two types- Client-server model; and Peer to peer. (i) In Client-server model one powerful computer is dedicated as server. All resources are placed at the disposal of the server. All other computers connected with the server (called clients) request the server for services. The server then provides the services requested. (ii) In peer to peer model there no server as such and each computer functions both as server and client. Peer means of equal rank.

Wireless Local Area Network (WLAN) is another type of LAN generally used for Internet access through laptop without using any cable. This technology is being used in airports, big hotels, offices, moving cars etc. It uses radio frequency for data communication. Flexibility is the main advantage of this system.

3.2.2 Metropolitan Area Network (MAN)

When the networking involves computers located within a metropolitan town/ city, it is called metropolitan area network. For example if a company has different branch/offices located within a town/city, and the computers located in those offices are interconnected then this type of interconnection is called metropolitan area network.

3.2.3 Wide Area Network (WAN)

When networking extends to beyond the area of a town/city, it is called wide area network. Normally it involves different geographical locations and uses public telephone network for transmission of data. In India examples are- Railway reservation network, Banking network (including ATM), Insurance network etc. Client-server model is established here. In railway reservation network, databases are stored centrally in high-powered computers (say Workstations, Mainframe etc.) and the terminals located in different reservation offices are treated as clients. Sometimes MAN is also called WAN.

3.2.4 Internetworking (Internet)

Internet is networking of the networks. Wide area networks located in different parts of a country/the world have been interconnected to form a worldwide network of computers. Interconnection is done with the help of *Gateways*. Unlike WAN with one central server, today's Internet has millions of servers with independent systems located throughout the world. These servers are maintained by *Gateways/Internet Service Providers* (ISPs). Protocols are used in Internet for smooth and efficient communication of data amongst different computer systems existing in the world-wide network. For example- TCP/IP (Transmission Control Protocol/Internet Protocol), HTTP (Hyper Text Transfer Protocol), FTP (File Transfer Protocol) etc. Protocols are nothing but special purpose software. Foundation for Internet was laid in 1970s when Vinton Cerf of America coined the idea of TCP/IP and Gateway. These ideas were used by ARPANET (Advanced Research Project Agency Network) of America, which later on emerged as Internet. Internet provides varieties of services like- information download, e-mail, Fax, news bulletin, website searching, Internet telephony, e-commerce transactions etc.

If Internet is viewed as Information Highway (I-way), then **websites** (also called World Wide Web or WWW) are information storehouses located on the highway. The first website was developed in 1989 in Switzerland. A website consists of several hyper linked web pages, which may contain not only texts but also pictures, sound etc. Internet alone cannot provide all the services mentioned in the preceding paragraph. Internet in combination with websites does the job. If Internet is the skeleton then websites are flesh. Organisations develop their own websites and host them on the Internet for access to people at large. Each website has a unique address called URL (Universal Resource Locator). For example- http://www.yahoo.com.

Gateway facilitates connection between different networks. In our country it is the main gate through which Internet links with other countries are established. Example- VSNL in India. There may be more than one gateway in a country. Links with other countries may be satellite links or cable links. Gateways have server computers and server software with them. They are whole-sellers of the service and Internet Service Providers (ISPs) are retailers. ISPs reach customers through public telephone network. When a telephone line is connected to the subscriber's home/ office computer through a modem, the networking at the end of the subscriber is completed. A subscriber may opt for an ordinary dial up line or an ISDN (Integrated Service Digital Network) line or leased line. Subscribers' computers are known as client computers.

Modem (Modulator Demodulator) instrument is used because computers are digital but telephone lines are analog. For data communication through Internet, conversion from digital to analog and vice-versa is required. A modem serves this purpose. However, where the telephone line is digital, use of modem is not required.

Browsing of the Internet and access to websites can be done by a subscriber through the client computer with the help of software known as *browser*. Examples are- Netscape, Mosaic, Internet Explorer etc. Browsers request the server for the required information and which in turn helps to access that information located anywhere in the world on the basis of URL.

E-mail is electronic mail sent through Internet. E-mail involves up loading of data, graphics, sound etc. in to the Internet. It has become very popular mode of communication in the present day because it is very quick and cost effective method of communication to anywhere in the world. All Internet subscribers get E-mail address free. If a person is not an Internet subscriber he/she can also get an E-mail address free of cost from the *portal* services. Portals are those websites, which have the facility of search engines, e-mail and other value added services. Examples are- microsoft.com, yahoo.com, rediffmail.com, indiatimes.com etc. While registering in a portal, the user has to choose the ID and password for the E-mail in addition to submission of other information. After confirmation of registration, the user gets a permanent E-mail ID. If the user wants to send mails he will have to get access to his portal's mail sending facility by using ID and password. After getting access, write the message and send it to the desired address.

E-commerce in simple terms can be said as transactions through the Internet. The foundation for e-commerce was laid when US Government in 1989 lifted the ban on use of Internet for commercial purpose. To enable e-commerce, a website must

be designed accordingly. These websites provide information on the product/service, extend facility for booking of orders and have provision for making payment by Debit/Credit cards. If the product is digital, delivery is also made through the Internet, otherwise it is delivered through currier/ transport. Example of a popular Indian e-commerce website is- irctcc.co.in to book railway ticket. Example of a popular international e-commerce website is- amazon.com for purchase of books.

3.2.5 Internet

A networking within an organisation is called intranet, whether it is a LAN or WAN. Sometimes facilities of Internet is also built up in intranet, like, e-mail, file transfer etc. for use by different departments of an organisation. That is why it is called mini Internet. However no outside connection is established. Since this is a private netwiork, it is more secure than Internet.

3.2.6 Extranet

Extranet is networking between two or more organisations. It lies in between Internet and intranet. For example- a company may establish extranet with its supplier, vendors, customers etc.

3.2.7 Value Added Network (VAN)

Actually it is not a separate category of network. If in a network (whether it is a computer network or telephone network), value added services are provided to the users it is called value added network. For example, in case of a cell phone network, basic service is mobile telephone facility but the value added services are voice mail facility, SMS, Internet browsing etc.

3.3 Multimedia

Media is means of communication. It may be unimedia or multimedia. A music system is unimedia (only audio) whereas a TV is a multimedia (both audio & visual). In the context of a computer, multimedia means the computer, which can present information in the form of text, audio, visual, graphics (drawings & pictures), animation etc. Power Point presentation is a good example of multimedia. Multimedia in limited form was available since long. But the present enhanced form was made possible since 1997, with the introduction of MMX microprocessor. For good quality of multimedia presentation, special type of faster processor, larger main memory, larger hard disk, quality input/output devices etc. are required. Audio,

visual, graphics, animation etc in digital form occupies much larger disk space than plain text. In case of cell phones multimedia message service (MMS) means the facility of sending music and pictures to other cell users.

3.4 Questions

1. What is computer network? What are its objectives?
2. What are the different types of network? Discuss.
3. Explain the following terms:
   a. Gateway
   b. E-mail
   c. Multimedia
   d. E-commerce
   e. Modem
   f. Intranet & Extranet

Unit 4 ❑ Introduction to Operating Systems

Structure

4.1 Need of Software/Program

Software is a set of instructions (in programming language) to a computer to perform a particular job. A machine without the help of software cannot perform any job. This job may be either to run the hardware system efficiently or to perform a specialized job like accounting, auditing, tax, publishing etc. The first type of software is called System software (or Operating System) and the second type is called Application software.

4.2 Operating System (or System Software)

Operating system may be described as a set of programs that control and coordinate the operation of the computer system for effective and efficient use of the same. An operating system also acts as a middleman between the hardware and the application software. Computer hardware understands machine language whereas application software is written in high-level language. To bridge the gap operating system plays a crucial role. When a computer is started, important system files of the operating system are transferred to the upper memory of RAM. Other files are called from disk as and when required. Examples of operating system are- MS-DOS, MS-WINDOWS, UNIX, LINUX, OS2 etc.

4.2.1 DOS

DOS (Disk Operating System) is the earlier version of operating system. There were two varieties of DOS- (i) MS-DOS and (ii) IBM DOS. The first one was developed by Microsoft and the second one was developed by IBM. In DOS users had to type in the commands in front of command prompt.

4.2.2 MS-Windows

MS-Windows is now the most popular version of operating system being used in personal computers throughout the world. Current version is XP. It has replaced MS-DOS. With the upgradation of microprocessor quality, operating system is also being upgraded. An important feature of MS-Windows is that it based on Graphical User Interface (GUI). Unlike DOS, commands are not required to be typed in. Commands can be given by clicking an icon with the help of the mouse pointer on the screen. Another important feature is that it helps to run more than one application software simultaneously. For example while working with MS-Word we can also open MS-Excel without closing the MS-Word. This was not possible in DOS environment. MS-Windows also help to split the screen into multiple windows. MS-Windows provides many facilities which are discussed below:

Desktop is that screen on which icons (representing path) of all the application software and of some important folders are shown. From the desktop we can access to any software/folder. After close of the software we again land on desktop. When power is turned on, BIOS performs Power On Self Test (POST) by comparing with the information contained in CMOS and also transfers important files of system software to RAM (refer Para 1.5.1). After completion of this step, desktop appears on the monitor.

Windows explorer is a tool with the help of which we can view names of all the disks, their folders, subfolders and files at a glance. From the explorer screen we can open, format & know properties of a disk; and open, copy, move, delete, change properties of any file/folder. To get explorer menu, go to the desktop. Then right click either on 'My Computer' or on 'My Documents' icons or on 'Start' menu. After getting 'Explore' menu, left click on it. Start menu is available on the bottom-left corner of the desktop.

Run is a submenu under Start menu on the desktop. It helps to open a program, folder or file without closing the program/file, which are already opened. On selection of Run submenu, a dialog box will appear. Type the name of the program, folder or file and click OK. In case of folder and file, path is to be mentioned. The specified program, folder or file will be opened.

Find is another submenu under Start menu, which helps to find a file or folder if one forgets the location of that file or folder. On selection of Find submenu, a dialog box will appear. Type the name of the file or folder and mention the name of the probable disk. Then click 'Find Now' button. If available, the file or folder will be shown on the dialog box.

Control Panel is a submenu under Settings, and Settings is the submenu under Start menu. Control Panel screen shows icons for tools and devices. One can change settings of any of the tools or devices. For changing, right click on the icon and choose Open. Thereafter make changes.

Printers is a submenu under Settings, and Settings is the submenu under Start menu. Printers screen can also be accessed through My Computer folder. From this screen, we can add new printer and/or make changes in the existing printer.

Paintbrush in Windows provides facility to draw sketch/painting on the screen with the help of mouse pointer and save it in a file if desired. To open the Paint screen, follow the path: Start menu→Programs→Accessories→Paint. On the Paint screen, Toolbox, Colour box, Pull down menus etc are available. By using these, one can draw beautiful pictures from the movement of the mouse and can save in a file. To know the nature of the tool or colour, put the mouse pointer on it.

Calculator in Windows can be used for calculation purpose, in place of ordinary calculator. To get the calculator, follow the path: Start menu→Programs →Accessories→Calculator. Buttons on the keyboard of the calculator shown on the screen can be pressed with the help of the mouse pointer. Two options are available for the calculator - Standard and Scientific. Option can be exercised from the View menu of the calculator.

4.3 Application Software

The software which is meant for application in particular type of job is called application software. Examples are- MS-Word, MS-Excel, MS-PowerPoint, Tally, CAD, DTP, Oracle etc. Application software resides on the platform of the operating system. On the desktop, icons of the application software are shown through which we can open those software. When such software is opened, it is placed in the lower memory of the RAM whereas system software is placed in the upper memory.

4.4 Programming Languages

Programs/software are set of instsuctions (in programming language) to a computer to perform a particular job. Computer hardware cannot understand ordinary

human languages. That is why special type of languages, called programming languages, have been developed so that hardware can understand those instruction. There are four generations of programming languages- Machine language, Assembly language, High-level language and Object oriented language.

4.4.1 Machine Language

Machine language is the first generation programming language. It used binary codes i.e. 0 & 1 for writing instructions. Major advantage of machine language was that the computer could understand it easily and no translator was required. However disadvantages were many. The programmer had a very difficult job to develop program. Remembering all the codes was almost impossible. Moreover program written for a particular computer model could not be used in other model. It was fully machine- oriented. Debugging (correction) of a developed program also was equally difficult job.

4.4.2 Assembly Language

Assembly language is the second generation programming language. It used mnemonic symbols instead of binary codes for writing instructions. Since hardware understands only machine language, a special program was required to translate assembly language into machine language. This translator is called assembler and usually the manufacturer supplies it. Advantage of assembly language over machine language was that the programmer's task became easier. Mnemonic symbols were not so difficult to remember. However other disadvantage remained i.e. it was also fully machine-oriented. Moreover translation slowed the program execution.

4.4.3 High-level Language

High-level language is the third generation programming language. It uses ordinary English like language and mathematical symbols for writing instructions. It is called high level language because it is not machine dependent whereas machine language and assembly language are called low level languages because they are machine dependent. Major advantage of high-level language is that the programmer's job became easiest since it is not at all difficult to remember English like language. Since it is not machine dependent, program once developed can be used in many computers. However, it is required to be translated into machine language with the help of compiler/interpreter before actual processing. In that way it is time consuming. But since speed of computers has been increased to a great extent, one cannot feel

the delay due to translation. Examples of high-level languages are- COBOL, BASIC, FORTRAN, PASCAL, C etc.

4.4.4 Object Oriented Languages

Object Oriented Languages have developed in recent years, which may be termed as fourth generation languages. Instead of writing detail program each time for routine jobs, prewritten standard programs are used in a large program. These standard programs are called objects. This reduces the effort of a programmer to a great extent. Examples are- C++, Visual Basic, JAVA etc.

4.5 Questions

1. What is software? Why we need software? What are the different types of software?
2. What is operating system? Why it is required? Give examples of operating system.
3. Explain the following features of Windows-
   a. Desktop
   b. Windows Explorer
   c. Run
   d. Paintbrush
   e. Control Panel
   f. Printers
   g. Find
   h. Calculator
4. Write short notes on-
   a. Application software
   b. Machine language
   c. Assembly language
   d. High level language
   e. Object oriented language
5. What do you understand by four generations of computer language? Explain.

Unit 5 ❑ Word Processor (MS-Word)

Structure

5.1 Introduction

This is one of the most popular software in the MS-Office package (or suite). This application software is meant for writing text like letters/ reports/ articles/books etc. In this software there are numerous facilities for editing the written text.

How to operate? On the top of the screen there are normally four bars. From top they are - *Title* bar, *Menu* bar(containing pull down menus like *File, Edit, View* etc.), *Standard* tool bar and *Formatting* toolbar. [To view other toolbars, select the pull down menu & submenu *View*→ *Toolbars*→desired toolbar]. On the toolbars, there are *icons*. The name of an icon can be known if we put the mouse pointer on it (**try it and remember the icons**). In the bottom of the screen, it is the *Task* bar and above it is the *Status* bar. In this software, the *cursor* is | shaped, which constantly blinks. The *mouse pointer* is I shaped when it is on the pages and arrow sign when on the bars. In this book, in case of reference to menu, '→' indicates submenu.

5.2 Commands for Text

1. **To Select typed text**-Type the text and select in one of the following ways: (a) Put the cursor and the mouse pointer at the beginning of the text, press the left button of the mouse & drag up to desired position; or (b) Put the cursor at the beginning of the text, keep the 'Shift' key pressed and press the →(right arrow) key till the selection reaches desired position; or (c) For selection of the whole text in a file, select the menu *Edit*→ *Select All.*
2. **To Make Bold/Italics/Underline**-(i) Select the text; and (ii) Click the icon *B/I/U* according to requirement. [To remove Bold/Italics/ Underline, repeat the steps.]
3. **To Change of Font size/ Font styles/Font color**-For change (i) Select the text (ii) Click the *Font Size/Font/Font Color* drop down menu (iii) Select the desired size/style/ color.

4. **To Copy**-(i) Select the text (ii) Click the *Copy* icon (iii) Put the cursor where it is to be copied (iv) Click *Paste* icon.
5. **To Move**-(i) Select the text (ii) Click the *Cut* icon (iii) Put the cursor where it is to be moved (iv) Click *Paste* icon.
6. **To justify both sides**-(i) Select the text (ii) Click the *Justify* icon.
7. **To check spelling**-(i) Put the cursor at the beginning of the text (ii) Click the *Spelling and Grammar* icon and get the 'Spelling and Grammar:' djalog box. (iii) On the dialog box, all words those are not in dictionary will be shown one by one. You can change those words as per suggestion given, or you can ignore if it is correct. After completion click OK button.
8. **To position a line at the center**-(i) Put the cursor on the line to be centered (ii) Click the *Center* icon.
9. **To give space between lines**-(i) Select the text (ii) Select the pull down menu *Format →Paragraph* and get the 'Paragraph' dialog box. (iii) On the dialog box click the *Line spacing* pop-up menu, selects the desired line space and click OK button.
10. **To count words**-For counting the number of words in a file, select the pull down menu *Tools→Word Count* and get the word count statistics.
11. **To insert page numbers**-(i) Select the pull down menu *Insert→Page Numbers* and get the 'Page Numbers' dialog box. (ii) From the dialog box select the *Position* and *Alignment* (from drop down menus). Then click OK button.
12. **To insert date and time**-(i) Put the cursor where the date and time is to be inserted. (ii) Select the pull down menu *Insert→Date and Time* and get the 'Date and Time' dialog box. (ii) From the dialog box, select the desired style and click OK button.
13. **To Insert a Table**-(i) Put the cursor at the point where such table is required (ii) Click *Insert Table* icon and get a dialog box (iii) From the dialog box, select the size of the table by moving the mouse pointer and then click on the dialog box. The table will appear at the cursor position. (iv) For insertion/deletion of column/row, select the column/row where insertion/ deletion is required and then select the pull down menu *Table→Insert (or Delete)→Column/Row* (v) For merging two or more cells, select the cells and select menu *Table→Merge Cells.* (vi) To split cells, select the row and go to menu *Table→Split Cells.* From the dialog box choose number of columns/rows and click OK. (vii) For borderless table, select the table, click the *Outside Border* pop-up menu and choose the *No Border* icon.

14. **To sort**-For sorting words/numbers/dates, (i) type vertically (i.e. type a word and press enter key) and select it. (ii) Then select the pull down menu *Table→Sort* and get the 'Sort Text' dialog box. Choose the Type and order. Finally click OK button. For sorting of a database, type data in a table, put cursor on the table and then follow the procedure as mentioned.
15. **To undo a command**-To withdraw/undo any command, which may have been wrongly given, click *Undo* icon immediate after the wrong command.
16. **To divide a page into columns**-(i) Put the cursor at the point where such columns are to be started (ii) Select the pull down menu *Format →Columns* and get the 'Columns' dialog box. (ii) From the dialog box, choose the desired column style and click OK button. To undo repeat the process.
17. **To drop the first letter of a paragraph**-(i) Select the first letter of the text (ii) Select the pull down menu *Format →Drop Cap* and get the 'Drop Cap' dialog box. (iii) From the dialog box, choose the desired style and the number of lines to drop and then click OK button.
18. **To write something on Header and/or Footer** (This will be shown on all the pages of a file automatically) - (i) Select the pull down menu *View →Header and Footer*. Header and Footer will appear on the file and the cursor will be active in Header and Footer only. Write whatever you like. (ii) A Header and Footer tool bar will also appear on the top. Use the icons on the tool bar for insertion of page number, switching between Header and Footer etc. (iii) To hide the Header and Footer, click the *Close* button on the tool bar.
19. **Automatic numbering of paragraphs**-(i) Click the *Numbering icon* and start typing. Whenever you press Enter key fc change of paragraph the next paragraph number will appear automatically.

    Auto para sub-numbering-(i) While in Auto para number mode, select the pull down menu *Format →Bullets and Numbering* and get the 'Bullets and Numbering' dialog box. (ii) On the dialog box click the *Outline Numbered* tag, choose the style of sub-numbering and click OK button. (iii) For sub-numbering, press Tab key and continue writing (iv) For coming back to original serial number, press Shift key + Tab key.
20. **Automatic correction of a word typed wrongly**-(i) Select the pull down menu *Tools→AutoCorrect* and get the 'AutoCorrect' dialog box. (ii) On the dialog box, type wrong the spelling or short form of the word in the *Replace* text box and the correct spelling or the full form of the word in the *With* text box. Then click *Add* button. You may add further words. Each time click *Add* button. Finally click *OK* button.

While typing on a page, type the wrong spelling or short form of the word and press Space bar. The word will be corrected/replaced automatically.

21. **For page setup**-Before typing, the size of the page should be set up keeping in mind the size of the paper in which print out is to be taken. For this, select the pull down menu *File→Page Setup* and get 'Page Setup' dialog box. Select paper size click OK.

22. **To find a word or to replace a word in a file**-(A). (i) Open the file (ii) Select the pull down menu *Edit→Find* and get the 'Find and Replace' dialog box. (iii) On the dialog box, type the word, which is to be found in the *Find what:* text box and press the 'Find Next' button. You will be shown first occurrence of the word. Continue to press the button till you reach the desired position of the file. (B) (i) same (ii) Select the pull down menu *Edit→Replace* and get the 'Find and Replace' dialog box. (iii) On the dialog box, type the word which is to be replaced in the *Find what:* text box and type the word by which it is to be replaced in the *Replace with:* text box. Then press the *Replace All* button.

23. **To see print preview**-Before printing it is advisable to see the preview of the page to be printed. For this click *Print Preview* icon. The full view of the page will be shown on the screen so that you can have a look on the get up of the printout. If it is found OK, press *Close* button of the Print Preview tool bar on the top.

24. **To Print**-For printing, switch on the printer and feed paper into the printer. Then select the pull down menu *File→Print* and get the Print dialog box. Choose the Page range and number of copies and click OK. For option regarding print quality/orientation, click Property button in the dialog box. Thereafter choose print quality/orientation

25. **For Mail Merge**-[When same letter is to be sent to different addresses, then one address is merged with one copy of the document and thus multiple copies of the same letter is produced with different addresses.] (a) Creation of the *Main Document*- (i) Type a letter in a word file and save it (without the address). (ii) Select the pull down menu *Tools→Mail Merge* and get the 'Mail Merge Helper' dialog box. On this dialog box, click the drop down menu *Create*. Select *Form Letters* and then press *Active Window* button. (b) Creation of *Data Source*- (i) On the 'Mail Merge Helper' dialog box, click the drop down menu *Get Data*. Select *Create Data Source* and get the 'Create Data Source' dialog box (ii) From this dialog box, select the fields name which is not required and press the button *Remove Field Name*.

Repeat it till all the unwanted fields are removed. Click OK button at the end. (iii) Give a file name of the Data Source and press *Save* button and get a message box. (iv) On this message box click *Edit Data Source* button and get the 'Data Form' dialog box. (v) On this dialog box type all the fields of all the records. Click OK button at the end. (c) Arrangement of fields- A mail merge tool bar will appear at the top. On the tool bar click the *Insert Merge Field* drop down menu and select the field name you want to arrange on the first line of the main document. It will be placed at the cursor position. Repeat the step for the second line and so on till completion. (d) Merging the data with the document-On the mail merge tool bar, click the *Merge to New Document* icon. The merger will be shown in a new file containing copies of the letter with different addresses. To get the original file, close the merged file with or without saving the same.

5.3 Commands for Graphics

1. **To insert Pictures/Word Art/AutoShapes etc.**-For insertion of - Clip Art/ Pictures from file/AutoShapes/Word Art/Chart etc., select pull down menu *Insert→Picture→Clip Art/From File/Auto Shapes /Word Art/Chart* and get the respective dialog box/tool bar. (a) In case of Clip Art, click on the desired picture from the dialog box and a toolbar will appear. Click *Insert clip* icon from the toolbar. (b) In case of pictures from file, select the file from the dialog box and press Insert button. (c) In case of auto shapes, AutoShapes toolbar will appear. Select the type and sub type of auto shapes. The mouse pointer will be converted to + sign. Put the mouse pointer in the desired position and press the left button of the mouse & drag up to desired size. (d) In case of Word Art, select a style from the dialog box and press OK button. Another dialog box 'Edit WordArt Text' will appear. Write the text and press OK button. (e) In case of chart, a window of Excel datasheet with default data and the column chart will appear. Change the default data by actual data and you will get your chart.
2. **To insert text box**- A text box is meant for writing text inside the box. For insertion of text box, select pull down menu *Insert→Text Box*. The mouse pointer will be converted to + sign. Put the mouse pointer in the desired position and press the left button of the mouse & drag up to desired size. [**Note**- Pictures can be edited with the help of **'Picture'** toolbar. Clip Art/ AutoShapes/Word Art/Textbox etc. can be inserted from 'Drawing' toolbar also. These toolbars can be viewed from *View→ Toolbars* menu.]

5.4 Questions

1. Perform the following in a word processor:
   a) Drop cap of an initial letter
   b) Create columns in a page
   c) Auto-correct a word
   d) Copy & move a text
   e) Set up a page
   f) Insert textbox
   g) Insert picture
   h) Print preview
2. Insert a 3x3 Table in the word processor and show how row/column is inserted/ deleted in a table.
3. Prepare your own **Bio-data** for submission to a College authority for a post of part-time lecturer in commerce. Requirements- The word Bio-Data should be of font size 16, the font 'Arial Black', bold and centered; line space 1.5; use auto paragraph number; give academic qualification in a table; check spelling; insert date & time; count the words and show print preview of the page after completion.
4. Write a notice for sending to 12 members of a co-operative housing society, using mail merge feature.

Unit 6 ❑ Electronic Spreadsheet (MS-Excel)

Structure

6.1 Introduction

Before spreadsheet came into existence, accountants used papers for calculations and workings. Definitely those days were difficult for the accountants. Keeping their problems in mind spreadsheet was developed. It is very powerful software, and has made difficult calculations a child's play. It comprises of electronic worksheets of very big size. Each worksheet consists of 65536 rows (1 to 65536) and 230 columns (A to IV). Intersections of rows and columns are called *cells*, which are rectangular in shape. It means there are 1,50,73,280 cells (i.e.65536 rows × 230 cols.).

How to operate? On the top of the screen, there are normally five bars. From top they are - *Title* bar, *Menu* bar (containing pull down menus like *File, Edit, View* etc.), *Standard* tool bar, *Formatting* tool bar and *Formula* bar. On the tool bars there are icons. The name of an icon can be known if we put the mouse pointer on it. At the bottom of the screen, it is the *Task* bar and above it is the *Status* bar. On the left side of the Formula bar, there is a 'Name box'. It shows the cell number of the cursor position. On the Formula bar, cell content of the cursor position is shown. In case of a formula, the formula is shown here and the result is shown in the cell. In this software the cursor is rectangular in shape and equals to the size of a cell. Bottom right corner of the cursor is broken one and is called *'fill handle'*. The mouse pointer is a fat plus sign when on the pages and arrow sign when on the bars.

In this unit, in case of reference to menu, '→' indicates submenu.

6.2 Commands

1. **To select cell(s)**- (i) For selection of one cell, put the cursor on the cell. (ii) For selection of more than one cell, put the cursor on the first cell and the mouse pointer inside the cell, press the left button of the mouse & drag rightward or downward up to desired position or Put the cursor at the beginning of the text, keep the 'Shift' key pressed and press the →(right arrow key) or ? (down arrow key) according to requirement, till the selection

reaches desired position. (iii) For selection of more than one non-continuous range of cells, at first select the first range, then keep the Ctrl key pressed, thereafter select the second range.

2. **Bold, Italics, Underline, Font size, Font style, Font color, Align left, Center, Align right, Copy, Move, Undo, Auto correct, Spell Check, Find, Find & Replace, Highlight etc.**- same as MS-WORD.

3. **(A) To edit a Cell**- (i) Overwrite on the Cell or (ii) Double-click on the Cell and then edit or (iii) Put the cursor on the cell and click on the Formula bar and then edit and finally press Enter key.

   (B) To copy cell content- (i) Put the cursor on the cell (ii) Put the mouse pointer on fill handle of the cursor and drag, keeping the left button of the mouse pressed.

   (C) To move cell(s) content- (i) Select the cell(s) (ii) Put the mouse pointer on the border of the cursor/selection and drag the border towards the desired direction, keeping left button pressed.

4. **To change column width**- Suppose column A is to be widened. (i) Put the mouse pointer on the borderline between column name A column name B. (ii) A cross sign will appear. Press the left button of the mouse and drag according to requirement.

5. **(A) To insert new Column/Row**- (i) Put the cursor on any cell of the Column/ Row where the new Column/Row is to be inserted (ii) Select the pull down menu *Insert→Columns/ Rows*.

   (B) To delete Column/Row- (i) Select the entire Column/Row by clicking on the Column/Row number.(ii) Select menu *Edit→ Delete*.

6. **(A) To insert Cells**- (i) Select the cell(s) where new cell(s) are to be inserted. (ii) Select the pull down menu *Insert → Cells* and get a dialog box 'Insert'. (iii) Choose which way the existing cells are to be shifted and then click OK.

   (B) To delete Cells- (i) Select the cell(s) to be deleted. (ii) Select the pull down menu *Edit → Delete* and get a dialog box 'Delete'. (iii) Choose which cells are to be shifted and then click OK.

7. **(A) To insert Worksheet**- Select the pull down menu *Insert → Worksheet*.

   (B) To delete Worksheet-(i) Open the Worksheet to be deleted. (ii) Select the pull down menu *Edit →Delete Sheet*.

8. **Summation of data in a Column / Row**- Select the data and click *AutoSum* icon.

9. **To make formula copy (relative to cell address)**- (i) Write the formula in relation to cell address and put the cursor on the cell, which contains the formula. (ii) Put the mouse pointer on the 'Fill-handle' of cursor, press the left button of the mouse and drag the 'Fill-handle' to the cell positions where the formula is to be copied. (Applicable for similar type of data in consecutive rows/ columns).

10. **(A) To create a series of numbers**- (i) Write the first two numbers of a linear series in consecutive cells. (ii) Select those two cells and drag the 'Fill-handle' of the cursor. [For G.P series- (i) Write the first number of a the series in a cell and put the cursor on the cell. (ii) Select the pull down menu *Edit→Fill→Series* and get a dialog box 'Series'. (iii) On the dialog box, click 'Growth', type the 'Step Value' & the 'Stop Value' and then click OK.]

    (B) To create a series of Days/Months/ Quarters- (i) Write the first day/ month/ quarter in a cell and put the cursor on the cell. (ii) Drag the 'Fill-handle' of the cursor.

11. **(A) To sort data in a column**-Select the data & click the *Sort Ascending/Sort Descending* icon.

    (B) To sort a database- [Database= related data in consecutive columns, where data in each row is called a record] (i) Select the database including the field names. (ii) Select the pull down menu *Data→Sort* and get a dialog box 'Sort'. (iii) On the dialog box, select the column by which the first order sorting is to be done [you can select the second order and third order sorting also] and then select whether it will be in Ascending/Descending order. Finally click OK.

12. **(A) To freeze Column / Row**- [NOTE -Left portion and upper portion of the cursor position will be frozen] (i) Put the Cursor at appropriate position (ii) Select the pull down menu *Window→Freeze Panes.* [To unfreeze, select the pull down menu *Window →Unfreeze Panes.*]

13. **(A) To link one cell with another cell in the same sheet** - (i) Put the cursor on an empty cell (ii) Type '=cell address' (address of the cell to be linked).

    (B) To link one cell of a sheet with another cell of another sheet - (i) Put the cursor on an empty cell of target sheet. (ii) Type '=sheet number! cell address' (of source Sheet).

14. **To move cursor to any cell of a sheet**- (i) Select the pull down menu *Edit→Go To* and get a dialog box 'Go To'. Type the cell address and click OK. Alternatively, type the cell address in the 'Name box' and press Enter key.

15. **To format a cell containing numbers-** (i) Select the cell(s) you want to format (ii) Select the pull down menu *Format→Cells* and get a dialog box ' Format Cells' (iii) Click the 'Number' tag and then select the category of format. Finally click OK.

16. **To see print preview**-Before printing it is advisable to see the preview of the page to be printed. For this click *Print Preview* icon. The full view of the page will be shown on the screen so that you can have a look on the get up of the printout. If it is found OK, press *Close* button of the Print Preview tool bar on the top.

17. **To print**- For printing, switch on the printer and feed paper into the printer. Then select the pull down menu *File→Print* and get the Print dialog box. Choose the Page range and number of copies and click OK. For option regarding print quality/orientation, click Property button in the dialog box. Thereafter choose print quality/orientation.

18. **Chart Features :**

Excel has excellent chart features both for creation and editing. **(A) Insertion of Chart**- (i) Type the data table for which a chart is to be prepared (ii) Select the table including the column and row headings. (iii) Click the *Chart Wizard* icon and get a dialog box 'Chart Wizard'. There are 4 steps in the dialog box. In Step 1 (i.e. Chart Type), choose either 'Standard Types' or 'Custom Type'. In case of 'Standard Types', next choose the 'Chart type' and 'Chart sub-type'. In case of 'Custom Types', choose the 'Chart type'. Press 'Next>' button to reach the Step 2. In Step 2 choose which one will be X-axis (i.e. column headings or row headings). In Step 3 (i.e. Chart options), under *Title* tag type the name of the chart, the name of the X-axis and the value of the Y-axis (in case of three dimensional, the Z-axis). Under *Axis* tag choose whether you want to show scale values in Y-axis (in case of three dimensional, the Z-axis). Under the *Legend* tag, select the placement of legend. Under *Data level* tag, choose 'Show value' if you want to show values or choose 'Show label' if you want to show text on the plot line. Press Next> button to reach Step 4. In Step 4 (i.e. Chart location), choose the location where the chart is to be placed (i.e. on the existing sheets or on a new embedded sheet) and press the 'Finish' button.

(B) Chart Editing : (i) To change size of the Chart area (outer box), the Plot area (inner box), the Legend, the Chart title & the Axis title, it must be selected first by clicking on the respective area. When selected, black handles will appear. Put the mouse pointer on the handle and drag. (ii) To move the chart,

put the mouse pointer on the border of the chart and drag. (iii) To format the chart area (outer box), Plot area (inner box), Legend, Chart title & the Axis title **right click** on the respective area and get the menu. (iv) To delete the chart, select it by clicking and click Cut icon. (v) To convert the chart into another type, select the chart and click the *Chart Wizard* icon and choose the desired type and press the 'Finish' button.

19. Excel as a data base :

Though Excel is not data base software still it has some features of DBMS (Data Base Management Software). Following facilities are available in Excel in connection with database:

(A) Creation of database- Columns can be used to create fields and the rows can be used for creating records. Column width can be increased/decreased to any size. Columns and rows can be inserted/deleted according to requirement. (Discussed in preceding paragraphs in this chapter.)

(B) Editing of structure and of data entry- These can easily be done by editing cells containing data/field headings. (Discussed in a preceding paragraph in this chapter.)

(C) Sorting database- (Discussed in a preceding paragraph in this chapter.)

(D) Display a particular record from a long database- Excel helps to find a particular record from a database. Select the fieldnames and click the pull down menu *Data →Filter→AutoFilter*. Dropdown-menu icons will appear on the fieldnames. Click the icon on the desired field and then select 'Custom'. A dialog box will appear; mention the condition on the dialog box and press OK. The desired field will be shown. If you want to remove data filter, repeat the menu selection.

(E) Append new records - It can be done directly. Alternatively click the pull down menu *Data →Form*. A dialog box will appear. Click 'New' button and type data under the given fieldnames. Finally press Enter key.

20. Excel Functions :

"Functions are predefined formulas that perform calculations by using specific values, called arguments, in a particular order, or structure. For example, the SUM function adds values or ranges of cells, and the PMT function calculates the loan payments based on an interest rate, the length of the loan, and the principal amount of the loan" (Microsoft Excel Help). These functions are ready-reckoner type solutions for various problems in finance, mathematics, statistics etc. These are very helpful for solution of real life problems.

Insertion of Functions-To insert functions (i) Click *Paste Functions* icon and get a dialog box 'Paste Functions'. (ii) Select from the dialog box the Function Category and Function Name you want to paste. Then click OK and get another dialog box for that particular function. (iii) Type the data asked for and click OK.

Alternatively memorize the function and type the syntax of the function in a Excel cell by putting actual values for the variables given in the bracket. The function must start with the prefix '='. The sign '=' and the letters between '=' and the first bracket comprise fixed portion and no change is to be made. Finally press Enter key. Let us take example of some Excel functions:

Financial Functions:

A. For calculation of amount of Installment for payment of a loan:

= PMT (rate,nper,pv,fv,type)

[Where =PMT is the fixed portion, Variables being, rate= rate of interest*, nper= number of installments, pv= principal amount of the loan, fv= lump sum payment, if any, at the end of term, type= 0 or 1(0 when installment is paid at the end of each period, say month, and 1 when installment is paid at the beginning of the month).]

*If installments are payable monthly, then the rate of interest also should be converted to monthly rate and so on. This rule is applicable in case of following problems also.

B. For calculation of Principal portion in the Installment-amount for payment of loan:

=PPMT(rate,per,nper,pv,fv,type)

[Where =PPMT is the fixed portion, Variables being, rate= rate of interest, per= the n^{th} month for which principal portion is to be calculated, nper= total number of installments, pv= principal amount of the loan, fv= lump sum payment at the end, if any, type= 0 or 1(0 when installment is paid at the end of each period, say month, and 1 when installment is paid at the beginning of the month).]

C. For calculation of Interest portion in the Installment-amount for payment of loan:

= I P M T (r a t e , p e r , n p e r , p v , f v , t y p e)

[Where =IPMT is the fixed portion, Variables being, rate= rate of interest, per= the n^{th} month for which interest portion is to be calculated, nper= total number of installments, pv= principal amount of the loan, fv= lump sum payment at the

end, if any, type= 0 or 1(0 when installment is paid at the end of each period, say month, and 1 when installment is paid at the beginning of the month).]

D. For calculation of Future Value of a series of payments:

= FV(rate,nper,pmt, pv, type)

[Where =FV is the fixed portion, Variables being, rate= rate of interest, nper= total number of installments, pmt= the amount of each installment, pv= lump sum payment at the beginning, if any, type= 0 or 1(0 when installment is paid at the end of each period, say month, and 1 when installment is paid at the beginning of the month).]

Note- This function can be used to calculate maturity value of a recurring deposit.

E. For calculation of Present Value of a series of future incomes:

=PV(rate, nper, pmt, fv, type) -When incomes are equal.

[Where =PV is the fixed portion, Variables being, rate= rate of interest, nper= total number of installments, pmt= the amount of each installment, fv= lump sum payment at the end, if any, type= 0 or 1(0 when installment is paid at the end of each period, say month, and 1 when installment is paid at the beginning of the month).]

=NPV(rate, range of cells containing incomes)-When incomes are even unequal/negative.

[Where =NPV is the fixed portion, Variables being, rate= rate of interest, and the cell addresses containing incomes (incomes are to be typed in consecutive cells)]

Note- This first function can be used to calculate present value of recurring incomes like pension etc. and second function can be used to calculate present value of profits/losses of a proposed project.

F. For calculation of Net Present Value of a project:

= The result arrived at by using the second function in E above - Initial investment in the project.

G. For calculation of Internal Rate of Return of a project:

=IRR(range of cells containing initial investment and returns on investment)

Note- Initial investment and losses are to shown in negative since these are outflows.

H. For other financial functions, click 'Paste Function' icon.

Logical Functions:

Logical functions are used to calculate results (values), when such results depend on the conditional test of the data. Generally these are applied in case of a database structure. These data may be of Character type, Date type, Numerical type etc. Examples of logical functions are-

A. IF function:

=IF(conditional test, value if true, value if false)

B. AND function:

=AND(Logical 1, Logical 2, ...)

C. OR function:

=OR(Logical 1, Logical 2, ...)

Example- Suppose there is a large database and we want to determine the Dearness Allowance (DA) rate applicable to different categories of employees, designation of whom are given in column A (say from A2 to A130) of a worksheet. In column B, rate of DA can be calculated against each employee using IF function. We will have to write the logical function in B2 cell correctly and thereafter copy the formula into B3 to B130 cells. The conditional logical function shall be -

=IF(A2= "Executive", 0, IF(A2= "Officer",15%, IF(A2= "Assistant", 25%,50%))))

In B2 cell, this function will give 0 if A2 cell contains the designation Executive, 15% if it contains Officer, 25% if it is Assistant and 50% in other cases (say Peon).

It may be noted that AND/OR functions can be combined within IF function.

21. Excel Graphics :

Excel graphics are same as MS Word graphics. Refer Chapter 5 for guidance.

6.3 Questions

1. Perform the following in Excel-
   i. Insert column/row/cell/worksheet
   ii. Delete column/row/cell/worksheet
   iii. Freeze row and/or column
   iv. Make formula copy
   v. Link one cell of a sheet with another cell of another sheet.

vi. Format a cell into currency

vii. Move cursor to any cell of a sheet with the help of menu

viii. Create a G.P. series - starting number 3 and common multiplier 2.

2. Create the following database in Excel and thereafter sort the same on the basis of Total -

Name	Roll	P1	P2	P3	Total
X	231	65	69	79	213
Y	145	55	60	44	159
Z	216	75	58	54	187

3. a) Create a Bar Chart from the following data:

	J	K	L
Maruti	45	63	49
Ford	54	62	74
Hundai	75	56	64

J, K & L are salesmen, who have sold respective products in units.

b) After creation, convert the bar chart into a line chart.

4. Calculate NPV and IRR from the following information of the two projects :

	Project A	Project B
	Rs.	Rs.
Initial Investment	18,00,000	15,00,000
Net Inflow - 1st year	6,00,000	5,15,000
- 2nd year	7,30,000	6,18,000
- 3rd year	7,00,000	5,90,000
- 4th year	4,55,000	6,00,000
- 5th year	5,00,000	5,00,000

Cost of capital of the company is 13%.

5. (a) Calculate the maturity value (i.e. Future Value) of a recurring deposit in the following case :-

Initial deposit to the bank- Rs. 5,000,

Recurring deposit at the beginning of each month Rs.500 for 3 years

Rate of interest being 6.5 per annum.

(b) Calculate the Present Value in the following case:-

Pension to be received at the end of each month Rs. 5,000

Estimated period 15 years,

Market rate of interest being 8% per annum.

6. You want avail a house building loan on September 1, 200x amounting to Rs. 6,00,000. The rate of interest is 9.25% per annum. The loan is to be repaid in 15 years on monthly basis, payable at the beginning of each month. The first installment is to be made in September 200x.

   Find the amount of EMI (Equated Monthly Installment) and also calculate the interest to be paid by you for 7 months from September 200x to March 200x.

7. What is logical function? For what purpose they are used?

Unit 7 ❑ Presentation Package (Power Point)

Structure

7.1 Introduction

You are familiar with presentation of a lecture with the help of overhead projector (OHP) slides. But slides created in computers with help of presentation software are far better in quality. Moreover many audio-visual effects can be added with the computerised slides, which is unthinkable in case of ordinary OHP slides. For projection of computerised slides, LCD (Liquid Crystal Display) projector is used. Now let us see how these are created with the help of MS Power Point.

7.2 Creation of a File Containing Slides

Whenever we open the software, *Power Point* dialog box is shown on the screen. Creation may be either through (A) *PowerPoint* dialog box or through (B) *File* Menu.

A. Through the Power Point dialog box :

This dialog box contains 3 radio buttons, select any one-

AutoContent Wizard

Design Template

Blank Presentation

a) If 'AutoContent Wizard' button is selected, click OK button and get *AutoContent Wizard* dialog box. In the dialog box:

Click *Presentation Type* and select type & subtype.

Click *Presentation Style* and select output medium, e.g. screen, overhead, 35mm slides etc.

Click *Presentation Option* and type title, footer text, if any. Options for slide no. & date are available.

Finally click *Finish* button.

b) If 'Design Templates' button is selected, click OK button and get *New Presentation* dialog box. In the dialog box there are 3 tags.

- From the *Design Template* tag, choose a design of your choice
- From *Presentation* tag, choose presentation type
- Click OK button.

c) If 'Blank Presentation' button is selected, click OK button and get *New Slide* dialog box. From the dialog box:

Choose a layout

- Click OK button.

B. Through File menu:

If file is to be created through File menu then close the *PowerPoint* dialog box and

Select the menu *File→New* and get *New Presentation* dialog box.

Then choose Blank Presentation or AutoContent Wizard under General tag or a design under Design Templates tag.

Thereafter follow the procedure as mentioned in A. above.

7.2.1 Editing a Slide

Slide editing (e.g. change of presentation design, layout, colour scheme etc.) can be made by right click on the target portion of slide. Menu will appear, choose appropriate menu.

7.2.2 Deletion of a Slide

To delete a slide, put the cursor on the slide and select the menu *Edit→Delete Slide.*

7.2.3 Insertion of Additional Slide(s)

To insert additional slide in a file, select the menu *Insert→New Slide.* Insertion will be made at the position next to the slide in which the cursor is residing.

7.2.4 Insertion of slide number, date & time and footer note

To insert these items, select the menu *View→Header and footer* and get a dialog box 'Header and Footer'. Select check boxes and press the button 'Apply to All'

7.2.5 Insertion of graphics

PowerPoint graphics are same as MS Word graphics. Refer unit 5 for guidance.

7.2.6 Insertion of other items

For insertion of Duplicate Slide, Symbol etc. select the *Insert* menu and the desired submenu.

7.2.7 Hiding a slide

To hide a slide, put the cursor on the slide and select the menu *Slide Show→Hide Slide.*

To unhide, repeat the abovementioned step.

7.2.8 Animation of the text/graphics

Go to the slide and select the text/graphics. Then select the menu *Slide Show→Preset Animation.* Finally choose the animation type. For animation preview of a slide, select the menu *Slide Show→ Animation Preview.* For further customization select the menu *Slide Show→Custom Animation.*

7.2.9 3-D effects

To give 3-D effect to an object in a slide, select it and click 3-D icon from the Drawing toolbox. (Drawing toolbar is found on the bottom of the screen).

7.2.10 Rotation

To rotate a text/picture, select it and click Draw drop down menu from the Drawing toolbox. From the menu, select *Rotate→Free rotate* etc.

7.2.11 Slide transition (including time and sound setting)

Put the cursor on the slide. Then select the menu *Slide Show→Slide Transition* and get 'Slide Transition' dialog box. From this dialog box you can choose- Transition type, Transition speed etc.

We can set timings manually for advancing slides. On the abovementioned dialog box type the timing under 'Advance Automatically after' text box and click Apply button.

We can add sound to a slide from the abovementioned dialog box. Choose the sound type from the drop down menu and click Apply button.

These features can be applied to the current slide only or it may be applied to all the slides of the file.

7.3 Rehearse Timings

To rehearse time required for presentation, select the menu *Slide Show→Rehearse Timings*. Forward each slide on completion of rehearsal of the slide by left click on the slide. After completion of rehearsal of all the slides the software will ask you whether you want to record the timings. If timings are recorded, manual forwarding of the slide shall not be required at the time of slide show.

7.4 Slide Preview

For slide preview, select the menu *View→Slide Sorter* (instead of Normal view).

7.5 Slide Show

For slide show, select the menu *Slide Show→View Show*.

Options during slide show:

(i) During show, forward movement of slides can be made by mouse click (provided it is enabled in 'Slide Transition' dialog box) or by the down arrow key or automatically if time is set. Backward movement can be done by up arrow key.

(ii) During show, if we want to use a pen for marking on the slide, right click on the slide and select *Pointer Options→Pen.* For change of ink color of the pen, again right click on the slide and select *Pointer Options→Pen Color.* For advancement to next slide, deactivate the pen.

(iii) For navigation (both forward and backward) into other slides, right click on the slide and select *Go→By title.*

(iv) During slide show, to escape from the show, press Esc key.

7.6 Questions

1. What are the alternative modes of creation of a file containing slides? Explain.
2. Perform the following after creation of slides-
   a. Edit a slide
   b. Delete a slide
   c. Hide a slide
   d. Insert additional slide
   e. Insert graphics
   f. Insert date & time on the slide
   g. Bring animation effect
   h. Bring 3-D effect
   i. Rotate a slide
3. How will you fix time required for showing each slide with the help of time rehearsal? Explain.
4. How will you show slides created by you? What are the options available at the time of slide show?
5. You have been asked to deliver a lecture on ODL. You are required to create slides by putting your best efforts for that purpose.

Unit 8 ❑ Financial Accounting Package (Tally)

Structure

8.1 Introduction

Tally is an India made software, unlike MS office. The getup of the software is also different from MS office.

In Tally, we need to create structures and make basic entries for journals, inventories, bank reconciliation etc. Thereafter the software will automatically make ledger postings; prepare - Trial Balance, inventory records including closing stock, Profit & Loss Account, Balance Sheet, Bank Reconciliation Statement, Funds Flow & Cash Flow Statements; work out Ratios etc.

8.2 Steps Involved

a. Creation of Company;
b. Creation of Ledger heads;
c. Creation of Units of Measure & Stock Items;
d. Passing of Voucher entries;
e. Entering Bank Dates for preparation of B.R.S.
f. Creation of Cost Centers/Branches (if any).

8.2.1 Creation of company

When a company wants to switchover to Tally from manual accounting system, company creation is necessary. This is one time job and need not be created in each year. Whenever the TALLY is opened, the following screen will appear :

Gateway of Tally		
		F1: Select Cmp
Current Period Current Date	**Company Info.**	**F4**: Backup
List of Selected Companies	Select Company	**F4**: Restore
Name of company Date of last Entry		**F11**: Features
	Create Company	**F12**: Configure
	Quit	

[Note-The middle column shows **Menu** and the right most column contains **Buttons**].

For creation of a new company we will have to choose (by putting the cursor on) *Create Company* menu and press ↵ key. A screen will appear for company creation. Thereafter write the Name and profile of the company as required by the screen. At last **Accept** it to save the creation.

8.2.2 Creation of ledger heads

After company creation is saved, the following screen will appear :

Gateway of Tally		
Current Period Current Date	**Gateway of Tally**	**F1**: Select Cmp
....	Accounts Info.	**F1**: Shut Cmp
	Inventory Info.	**F2**: Date
List of Selected Companies	Voucher Entry	**F2**: Period
Name of company Date of last Entry	Import of Data	**F3**: Company
....	Balance Sheet	**F3**: Create Cmp
	Profit & Loss A/c	**F4**: Backup
	Stock Summary	**F4**: Restore
	Ratio Analysis	**F11**: Features
	Display	**F12**: Configure
	Multi-Account Printing Quit	

Now we will proceed to create ledger heads. Note that Cash Account, P7L Account need not be created since these are created by default. Other ledger heads have to be created.

For creation of ledger heads, choose the menu/submenu:

Accounts Info.→ Ledgers→ Create

Thereafter a screen namely 'Ledger Creation' will appear. Write (i) the name of the Ledger head (ii) the name of the Group head* and (iii) other information as required. In case of each ledger head, give complete information and finally **Accept** it to save the creation. Repeat this process till all ledger heads are created.

*Note that each Ledger head must be put under appropriate Group head. Some examples are given below for reference:

Ledger Head	**Group Head**
Capital	Capital Account
Any bank	Bank Accounts
Purchase	Purchase Account
Sales	Sales Account
Purchase Return	Purchase Account
Sales Return	Sales Account
Expenses (Trading A/c)	Direct Expenses
Income (Trading A/c)	Direct Incomes
Expenses (P&L A/c)	Indirect Expenses
Income (P&L A/c)	Indirect Incomes
Individual Debtors by name	Sundry Debtors
Individual Creditors by name	Sundry Creditors
Any fixed asset	Fixed Assets
Any investment	Investments
Loans/Advances	Loans/Advances (Assets)
Any current asset	Current Assets
Any item of Reserve & Surplus	Reserve & Surplus
Any secured loan	Secured Loans
Any unsecured loan	Unsecured Loans
Any current liabilities	Current Liabilities

After completion, continue the press the **Esc** key till you reach the 'Gateway of Tally' screen as mentioned above.

8.2.3 Creation of units of measure & stock items

This step is for creation of the structure for inventory records. Two things are to be created under this head (i) Units of measure and (ii) Stock items.

(a) For creation of units of measure, choose:

Inventory Info. → Units of Measure → Create

Thereafter a screen namely 'Unit Creation' will appear. Write (i) symbol of the unit of measure (ii) the formal name of the unit of measure and (iii) the number of decimal places (if any). For each unit of measure, give complete information and save the creation. Repeat this process till all units are created. After completion, continue to press the **Esc** key till you reach the menu with the heading 'Inventory Info.'

(b) For creation of stock items, choose:

Inventory Info. → Stock Items→ Create

Thereafter a screen namely 'Stock Item Creation' will appear. For creation write (i) the name of the stock item (ii) the units of measure as created in the previous paragraph and (iii) opening balance (if any). For each stock item, give complete information and save the creation. Repeat this process till all stock items are created.

Note- At the time of voucher entry for purchases (raw material/finished goods) and sales, information on inventory has to be furnished. Value of closing stock will automatically appear in the Profit and Loss Account In case of *Manufacturing Company*, for consumption of raw materials and production of finished goods, press Alt+F7 and pass voucher entry in *Stock Journal*. Finished stock balance will appear automatically. (In both the cases integration of accounts and inventory is to be enabled through F11).

To see stock summary- Choose *Gateway of Tally→Stock Summary*. Alternatively, go through Profit and Loss Account.

8.2.4 Passing of voucher entries

For passing voucher entries, choose the submenu *Voucher Entry*.

Thereafter a screen namely 'Voucher Creation' will appear. By default it is Payment mode. For choosing any other mode, press the respective key as mentioned below:

i) Contra (F4 key)- For all contra entries;

ii) Payment (F5 key) - For all cash/bank payments;

iii) Receipt (F6 key) - For all cash/bank receipts;

iv) Sales (F8 key) - For all sales;

v) Purchase (F9 key) - For all purchases;

vi) Journal (F7 key) - For any entry not accommodated in 5 modes above.

[Note- In Tally there are 6 modes (other than Stock Journal), whereas the manual system of accounting has 8 types of Journals.]

In case of each voucher entry, give complete information including narration and finally **Accept** it to save the creation.

[Note—If any ledger head creation is needed at this stage, press keys Alt+C as short cut method. Then create the ledger head, save it and automatically come back to the voucher entry mode.

If change of date is needed, press F2 key. If the default change is acceptable, press Enter key. Otherwise type the change and press Enter key

Unlike manual system, Credit side may come first while passing voucher entries]

8.2.5 Entering bank dates for preparation of B.R.S

Only thing we will have to do is to put the dates as per the passbook/bank statement in our B.R.S. page for all the bank transactions. Tally will automatically prepare the B.R.S.

For this we will have to start by putting the cursor on the Bank Account (available in the Trial Balance/Balance Sheet). Continue to press the **Enter** key till you find **F5: Reconcile** on the right side margin. Press F5 key and get the page for entering dates as per bank statement. Enter dates for each of the bank transaction recorded in the cashbook. Finally **Accept** it to save the creation. Again press F5 key and get the B.R.S.

8.2.6 Creation of cost centers/branches

At first click 'F11: Features' button available on the right side. Change 'Maintain Cost Center' to 'Yes' and save. Then only the submenu of Cost Centers under Accounts Info will appear. For creation of cost centers, choose the menu/ submenu :

Accounts Info. → *Cost Centers* → *Create*

Create all the cost centers one by one under 'Primary' and save them.

[Note- Cost centers, if any, are to be created before creation of ledger heads so that at the time of ledger head creation, information for **Allocate to Cost-centers** can be supplied i.e. Yes/No depending on applicability. At the time of voucher entry, information on cost centers has to be furnished for all such accounts involving cost centers.]

8.3 Miscellaneous

8.3.1 Alteration/Deletion

(i) Ledger Head- Reach the Ledger Alteration screen through *Accounts Info.* → *Ledgers* → *Alter.* For alteration, make changes and save. For deletion, press Alt.+D keys. Note that a ledger cannot be deleted if there is a voucher entry under the ledger head.

(ii) Voucher Entry- Reach the Voucher Alteration (Secondary) screen via Trial Balance/P&L Account/Balance Sheet. For this you will have to start by putting the cursor on the Ledger Account (in the Trial Balance/P&L A/c/Balance Sheet). Continue to press the **Enter** key and select month and date till you reach that screen. For alteration, make changes. For alteration of voucher date, press F2 at this stage, and make changes. Then save all the changes. For deletion, press Alt+D keys.

(iii) Stock Item/ Units of measure- Reach the 'Stock Item Alteration' screen through *Inventory Info.*→ *Stock Items*→ *Alter.* For alteration, make changes and save. For deletion, press Alt.+D keys. Follow similar procedure for Units of measure.

(iv) Company- For alteration, reach the Company Alteration screen by clicking the 'Create Cmp' button at Gateway of Tally. Then choose Alter submenu and make changes and save. For deletion, memorise the code number of the company from Tally and delete with the help of Windows Explorer.

8.3.2 Change of Accounting Period

For change of period, click Period button on the right side at the Gateway of Tally screen. Make the change and press Enter key. All structures created in the previous accounting period and also closing balances will automatically stand transferred.

8.3.3 For Viewing

For viewing the following items, go through the following menu:-

	Item	Menu
1.	Profit & Loss Account	*Gateway of Tally→ Profit & Loss A/c*
2.	Balance Sheet	*Gateway of Tally→ Balance Sheet*
3.	Trial Balance	*Gateway of Tally→Display→Trial Balance*
4.	Ledgers	While going to the Voucher Alteration (Secondary) screen, you will find 'Ledger Monthly Summary' and monthly 'Ledger Vouchers' for each month.
5.	Day Book	*Gateway of Tally→Display→Day Book*
6.	Inventory Summary	*Gateway of Tally→Stock Summary*
7.	Cash Flow/Funds Flow	*Gateway of Tally→Display→Cash/Funds Flow*
8.	Ratios	*Gateway of Tally→Ratio Analysis*
9.	Cost Center Breakup	*Gateway of Tally→Display→Statement of Accounts→ Cost Centers→ Cost Center Break-up.*
10.	Vertical Balance Sheet/ Profit & Loss A/c	View horizontal Balance Sheet and click 'F12: Configure' button available on the right side. Change 'Show Vertical Balance Sheet' to 'Yes' and save. Follow similar procedure for vertical Profit & Loss A/c

8.4 Questions

1. What the steps involved for preparation of final accounts of a company, which will be prepared with the help of Tally for the first time?
2. Create a company in your own name, open necessary ledger accounts, pass the following journal entries and finally prepare a Bank Reconciliation Statement as on 30.4.200x in **Tally**:

Date	Particulars
1.4.200x	Brought Capital in cash Rs. 5,00,000
2.4.200x	Deposited into bank Rs. 4,00,000.
-do-	Purchased goods through cheque -Rs. 1,00,000 (encashed on 1.5.200x)
3.4.200x	Sold goods for Rs. 30,000, received a cheque and deposited into the bank. (This cheque was credited by bank on 8.4.200x)

14.4.200x	Sold goods for Rs. 80,000 received a cheque and deposited into the bank.
	(This cheque was credited by bank on 2.5.200x)
20.4.200x	Withdrawn from bank Rs. 50,000 for office use.
25.4.200x	Bank charge debited by bank Rs. 250.
30.4.200x	Interest credited by bank Rs. 230.

3. Create a company in **Tally**, pass one journal entry for capital brought in bank, and then delete the ledger heads.

4. Create a company with your own name in **Tally**; make one entry for cash purchase, including entries for inventories.

5. Create a company in your own name, open necessary ledger accounts and pass the following journal entries including inventories in **Tally**:

Date	Particulars
1.4.200x	Brought Capital in cash Rs. 5,00,000
	Loan taken from Bank Rs. 1,00,000
	Deposited Rs. 3,00,000 into the bank
2.4.200x	Purchased 12 computers for Rs. 2,40,000 and paid in cheque,
	(Cheque encashed on May 2, 200x)
3.4.200x	1 computer returned to the supplier and received Rs. 20,000 in cash.
7.4.200x	Sold 7 computers to NSOU on credit-Rs 2,10,000.
10.4.200x	Sold 3 computers in cash- Rs. 85,000.

Also show the value of Closing Stock on 30.4.200x.

6. Create a company in your own name, open necessary ledger accounts and pass the following journal entries in **Tally** and show the effect on the Profit & Loss Account:

Date	Particulars
1.4.200x	Brought Capital in cash Rs. 15,00,000
	Deposited Rs. 14,00,000 into the bank.
2.4.200x	Purchased goods of Rs. 2,00,000 and paid in cheque,
	Purchased Furniture of Rs. 63,000 and paid cash,
3.4.200x	Sold Goods for credit-Rs 2,50,000 to C.
30.4.200x	Paid rent Rs. 4,300.
	Bad Debt written off Rs.2,500.

7. How will you perform the following:
   a. Alter a ledger head
   b. Delete a ledger head having journal entries
   c. Alter a voucher entry
   d. Delete a voucher entry
   e. Alter stock item/unit of measure
   f. Delete stock item/unit of measure
   g. Change the date of a voucher entry which was passed earlier
   h. Show vertical Balance Sheet
   i. See the Trial Balance
   j. See Day Book for a particular date.
   k. See Funds Flow/Cash Flow Statements
   l. Change Accounting Period
   m. Alter company name, accounting year etc.
   n. Create cost centers.

8.5 References

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Many guidance-books are available in the market for application software. Generally each book covers one application software only. Naturally these books are voluminous in nature. Therefore students are advised to concentrate primarily on this study material. However they may take help from the related software itself while practicing. To get help click the menu *Help? Microsoft Word Help/ Microsoft Excel Help* and so on. Or click the help icon on the Standard tool bar. Then follow the instructions given there.

মানুষের জ্ঞান ও ভাবকে বইয়ের মধ্যে সঞ্চিত করিবার যে একটা প্রচুর সুবিধা আছে, সে কথা কেহই অস্বীকার করিতে পারে না। কিন্তু সেই সুবিধার দ্বারা মনের স্বাভাবিক শক্তিকে একেবারে আচ্ছন্ন করিয়া ফেলিলে বুদ্ধিকে বাবু করিয়া তোলা হয়।

— *রবীন্দ্রনাথ ঠাকুর*

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