

PAPER – 6 : INFORMATION TECHNOLOGY

Question No. 1 is compulsory.
Answer any four questions from remaining six questions.

Question 1

(a) Convert the following from one number system to another system along with the Working Notes:

- (i) $(65.65)_{10} = (\dots\dots\dots)_2$
- (ii) $(12AE)_{16} = (\dots\dots\dots)_{10}$
- (iii) $(39.B6)_{16} = (\dots\dots\dots)_8$
- (iv) $(245)_8 = (\dots\dots\dots)_{16}$
- (v) $(1011.1101)_2 = (\dots\dots\dots)_{10}$ (1 × 5 = 5 Marks)

(b) Describe briefly, the following terms with reference to Information Technology:

- (i) Flash Memory
- (ii) Clock Speed
- (iii) URL
- (iv) File volatility
- (v) Seek time. (1 × 5 = 5 Marks)

(c) Give one or more reasons of use for each of the following:

- (i) MICR
- (ii) SQL
- (iii) Boot Record
- (iv) GUI
- (v) Disk formatting program. (1 × 5 = 5 Marks)

(d) Write True or False for each of the following:

- (i) Computer system may function a bit faster if certain of program's window are closed on the system running too many applications simultaneously.
- (ii) Binary equivalent of a terminating decimal fraction need not be terminating.
- (iii) Protocol is geometric arrangement of computer resources.
- (iv) The largest number a computer can store depend on its 'WORD LENGTH'.
- (v) Formula is an equation that performs operation on worksheet. (1 × 5 = 5 Marks)

Answer

(a) (i) $(65.65)_{10} = (\dots\dots\dots)_2$

For the Integral Part

$$=$$

2	65	
2	32	1
2	16	0
2	8	0
2	4	0
2	2	0
2	1	0
	0	1

$$= (1000001)_2$$

Now, for the Fractional Part

$$= 0.65 \times 2 = \underline{1}.30$$

$$0.30 \times 2 = \underline{0}.60$$

$$0.60 \times 2 = \underline{1}.20$$

$$0.20 \times 2 = \underline{0}.40$$

$$0.40 \times 2 = \underline{0}.80$$

$$0.80 \times 2 = \underline{1}.60$$

$$0.60 \times 2 = 1.20 \text{ (Repeat)}$$

$$= (101001\dots)_2$$

So, the complete Binary form of $(65.65)_{10}$ is as follows:

$$(65.65)_{10} = (1000001.101001\dots)_2$$

(ii) $(12AE)_{16} = (\dots\dots\dots)_{10}$

$$= 1 \times 16^3 + 2 \times 16^2 + 10 \times 16^1 + 14 \times 16^0$$

$$= 1 \times 4096 + 2 \times 256 + 10 \times 16 + 14 \times 1$$

$$= 4096 + 512 + 160 + 14$$

$$= (4782)_{10}$$

(iii) $(39.B6)_{16} = (\dots\dots\dots)_8$

To convert the given number from Hexadecimal number system to Octal number system, each digit of the number will be represented in Binary form using a group of

four bits

$$= 0011 \quad 1001 \quad .1011 \quad 0110$$

Now we need to regroup each 4-bit Binary form into 3-bit Binary form as follows-:

$$= 000 \quad 111 \quad 001 \quad .101 \quad 101 \quad 100$$

$$0 \quad 7 \quad 1 \quad .5 \quad 5 \quad 4$$

$$(71.554)_8$$

Hence, $(39.B6)_{16} = (71.554)_8$

(iv) $(245)_8 = (\dots\dots\dots)_{16}$

To convert the given number from Octal number system to Hexademical number system, each digit of the number will be represented in Binary form using a group of three bits.

$$= 010 \quad 100 \quad 101$$

Now we need to regroup each 3-bit Binary form into 4-bit Binary form as follows-:

$$= 0000 \quad 1010 \quad 0101$$

$$= 0 \quad A \quad 5$$

$$= (A5)_{16}$$

Hence, $(245)_8 = (A5)_{16}$

(v) $(1011.1101)_2 = (\dots\dots\dots)_{10}$

$$= 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0 + 1 \times 2^{-1} + 1 \times 2^{-2} + 0 \times 2^{-3} + 1 \times 2^{-4}$$

$$= 1 \times 8 + 0 \times 4 + 1 \times 2 + 1 \times 1 + 1 \times 0.5 + 1 \times 0.25 + 0 \times 0.125 + 1 \times 0.0625$$

$$= 8 + 0 + 2 + 1 + 0.5 + 0.25 + 0 + 0.0625$$

$$= (11.8125)_{10}$$

Hence, $(1011.1101)_2 = (11.8125)_{10}$

- (b) (i) Flash Memory: Flash Memory is a memory in which the data is recorded permanently and is not wiped out when the power is turned off. Flash memory devices are very fast because they do not have any moving part.
- (ii) Clock Speed: Clock Speed is the speed at which the processor executes instructions. It is measured in megahertz (MHz) which is equal to million cycles per second. Higher the clock speed, faster will be the processor and better will be the system's performance.
- (iii) URL: URL stands for Uniform Resource Locator. It is an address which is used to access individual web pages and Internet resources located on the web servers. The format of a URL is as follows:

Protocol://Internet Address/Web page Address

- (iv) File Volatility: File Volatility refers to the number of additions and deletions performed in a file in a given period of time. An example of a volatile file is a "Payroll" file where employees' roaster continuously changes.
 - (v) Seek Time: Seek time is the time required to position a movable read-write head over the recording track to be used. If the read-write head is fixed, then seek time will be zero.
- (c)
- (i) MICR: MICR stands for Magnetic Ink Character Recognition. It allows the computer to recognize characters printed using magnetic ink. This technology is used to read electronic numbers printed on the bottom of the cheque.
 - (ii) SQL: SQL stands for Structured Query Language. It is a query language having a set of easy to use commands for creating, updating, deleting, and accessing data from a database. It allows end users to perform ad hoc queries on the database interactively without the aid of programmers.
 - (iii) Boot Record: Boot record is a small program that runs when the computer system is switched on. It determines whether the disk has the basic components, which are necessary to run the operating system successfully. If it determines that the required files are present, it transfers the control to one of the operating system programs that continues the process of starting up. It also describes the disk characteristics such as number of sectors per track and number of bytes per sector.
 - (iv) GUI: GUI stands for Graphical User Interface. It provides a user-friendly graphics oriented environment. Using GUI, the user can interact with operating system and other software packages by selecting options from menus that are temporarily super-imposed over whatever is currently on the screen. Mouse is used to position the graphics cursor over the appropriate icons. GUI has effectively eliminated the need for users to memorize and enter cumbersome commands.
 - (v) Disk Formatting Program: A disk formatting program allows a user to prepare (i.e., create tracks and sectors) a new, blank diskette to receive data from the computer system. The data cannot be stored on a diskette until it is formatted or initialized.
- (d)
- (i) True
 - (ii) True
 - (iii) False
 - (iv) True
 - (v) True.

Question 2

Distinguish between the following:

- (i) CD-ROM and ROM-BIOS.
- (ii) Internet and World Wide Web.
- (iii) Multi-Programming and Multi-Tasking.

- (iv) Control Unit and ALU.
(v) MODEM and Multiplexer. (4 × 5 = 20 Marks)

Answer

- (i) CD-ROM and ROM-BIOS: CD-ROM stands for Compact Disc - Read Only Memory. It is an auxiliary storage device which is used to store large volumes of data and text. CD-ROMs are often used for the distribution of computer programs / softwares and user manuals. Using CD-ROM, the content can be read into primary storage for processing or display. However, the data on the disk are fixed, they cannot be altered.

ROM-BIOS stands for Read Only Memory – Basic Input Output System. It contains a set of instructions which perform the basic control and supervisory operations for the computer. These instructions are needed frequently by the computer system (to provide basic input/output services) and are not available in the computer circuitry.

- (ii) Internet and World Wide Web: Internet is a global network of computer networks formed by various educational, commercial, Government, non-profit and military organizations linked together, sharing same resources. They exchange data and information by packet switching and using the standard 'Internet Protocol' (IP). Besides data exchange, it also provides the facilities like e-mail, chatting, games, message boards, etc.

World Wide Web (WWW) is a component of the Internet that provides access to large amounts of information located on many different servers. It also provides access to many of the services available on the Internet. It contains collection of interconnected documents and other resources which are linked through hyperlinks and URLs.

- (iii) Multi-Programming and Multi-Tasking: Multiprogramming is defined as execution of two or more programs that all reside in primary storage. It is a processing mode in which several partially completed programs are processed concurrently. At any given moment, only one program or job is actually being executed, but within a larger time span of several minutes, the computer is processing several jobs or programs, alternating between actually executing, and performing input/output activities. The advantage of multiprogramming is that overall performance of the system can be enhanced. Main frames and mini computers work in multi-user multiprogramming environment.

Multitasking is a logical extension of multiprogramming. Personal computers generally work in multitasking environment. It refers to the operating system's ability to execute two or more of a single user's tasks concurrently. The main advantage of multitasking is efficient CPU utilization. It provides single user with multiprogramming capabilities. This is often accomplished through foreground/background processing. Multitasking operating systems such as Windows, OS/2 and UNIX only run on more powerful microprocessors.

- (iv) Control Unit and ALU: Control Unit supervises the entire operation of the computer system. It selects the program statement from the storage unit, interprets the statement and sends the appropriate electronic impulses to the ALU and storage unit to cause these units to carry out the operations required. Its function is to maintain order and

direct the flow of sequence of operations and data within the computer. It instructs the input devices when to start and stop transferring data to storage unit, and it also tells the storage unit when to start and stop transferring data to output devices.

Arithmetic and Logic Unit (ALU) actually performs mathematical calculations, compares numeric and non-numeric values and makes decisions. The data flows between ALU and the storage unit during processing. Specifically, data is transferred as needed from the storage unit to the ALU, manipulated and returned to the storage unit.

- (v) MODEM and Multiplexer: Modem stands for Modulator/Demodulator. It is a device that converts a digital computer signal into an analog telephone signal (i.e. it modulates the signal) and converts an analog telephone signal into a digital computer signal (i.e. it demodulates the signal) in a data communication system. Modems are required to telecommunicate computer data with ordinary telephone lines because computer data is in digital form but telephone lines are analog. Modems can be categorized into internal and external modems.

Multiplexer is a device that enables several devices to share one communication line. A number of devices are connected to the multiplexer. Multiplexer scans each device to collect and transmit data on a single line to the CPU. It also communicates transmission from the CPU to the appropriate terminal linked to the multiplexer. Devices connected to the multiplexer are polled and periodically asked whether there is any data to transmit. Data collected from all terminals are transmitted on same communication line.

Question 3

- (a) Mention the advantages of DBMS.
 (b) Discuss various issues related to data management.
 (c) There are total 6,000 students in a university having four different disciplines. Their discipline code and yearly tuition fee per student, details are as follows:

Discipline of student	Code	Yearly tuition fee
Medical	M	80,000
Engineering	E	60,000
Science	S	40,000
Arts	A	25,000

Draw a flowchart to read the name, discipline code of the student's from the terminal/file. Find the total yearly revenue earned and the number of students discipline wise. Also find the percentage of contribution to the total revenue from each discipline of students.

Print the total revenue collected and the number of students, the percentage of their contribution discipline wise to the total revenue earned by the university.

(5 + 5 + 10 = 20 Marks)

Answer

(a) Advantages of DBMS (Database Management System) are as follows:

1. **Data Sharing:** The data from the entire company is available at one place and at the disposal of the users who need them, which helps them to analyze a large store of information.
2. **Reduced Data Redundancy:** A database minimizes duplication of data from file to file.
3. **Improved Data Integrity:** Because data redundancy is minimized, data inconsistency and the threat to data integrity are substantially reduced.
4. **Data Independence:** A database system keeps descriptions of data separate from the applications that use that data. Thus, changes in the data definitions can occur without changing the application program that uses the data.
5. **Increased Application Programmer and User productivity:** An Application program development tool offered by DBMS improves the programmer's productivity. The users can also increase their productivity by using query languages and report generators that allow them to produce reports from the database with little technical knowledge.
6. **Improved Data Administration and Control:** Since the responsibility of database is at one person's hand, it permits better enforcement of standards for defining data elements and data relationships. Moreover, access to data, privacy of data, updates and deletions of data become much easier to control.
7. **Increased Emphasis on Data as a Resource:** Establishing database administration and deploying a database management system results in greater corporate attention to information systems and aids to managerial decision making and long-range planning using the database as the basic information resource.

(b) All issues regarding the effective management of data fall into at least one of the following categories:

- (1) **Content:** What data should the organization collect in future? What data are being currently collected by the organization?
- (2) **Access:** In what ways should organized users access the data in order to effectively perform their jobs? This issue involves the timing required to get data to the users when they need it, and also the issues of which users have a right to which data.
- (3) **Organization:** In what ways should the data be logically and physically organized to the key types of data accesses required by the users?
- (4) **Accuracy:** Which validation, editing and auditing procedures are necessary in every stage of the input - processing - output cycle to ensure that data and information generated from the data are correct?

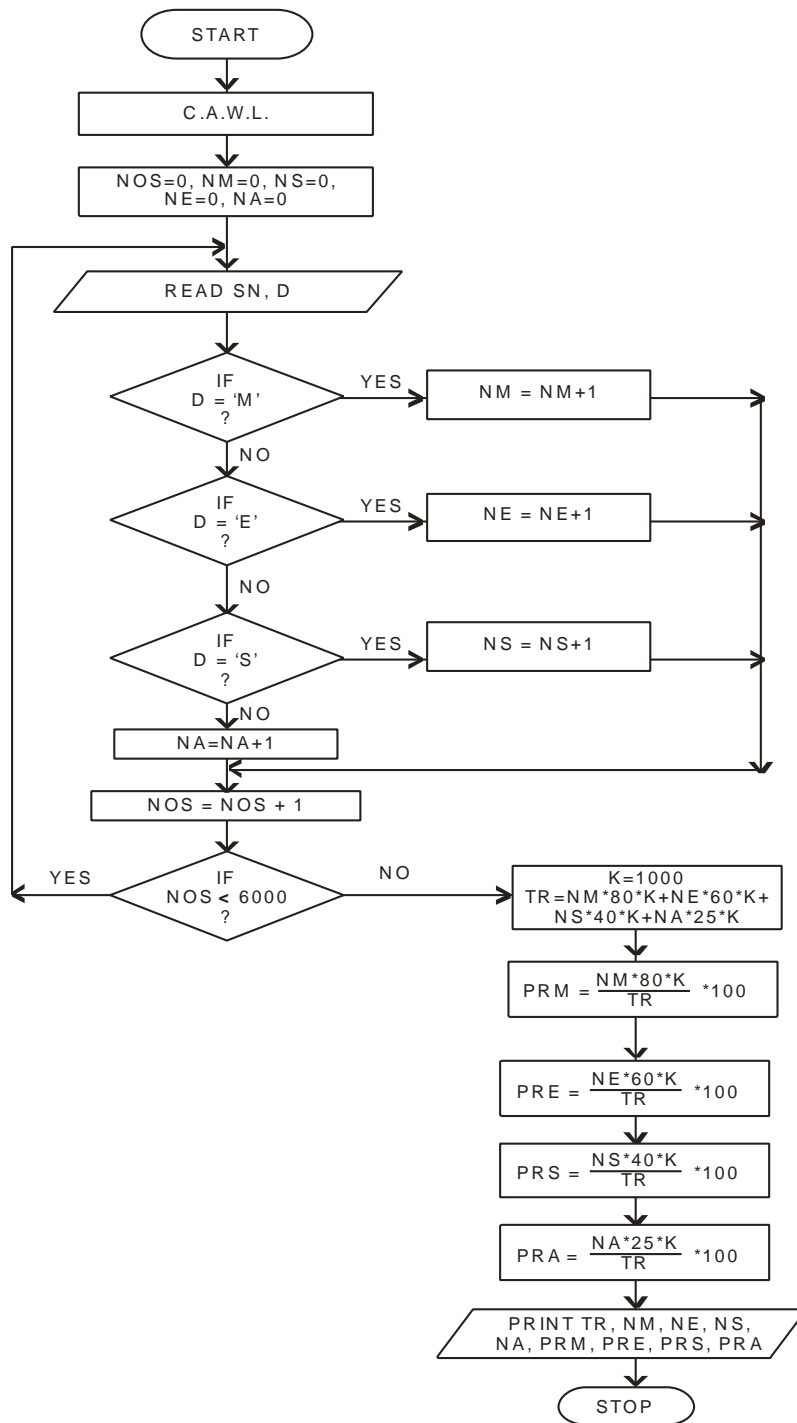
- (5) Integrity: What controls are necessary in each stage of the input-processing-output-storage cycle to ensure that data are up-to-date and that changes to specific occurrences of data are made everywhere in the system?
 - (6) Security: How will data be protected from such possible events as unauthorized access, unauthorized modification, outright theft, and malicious or unintentional destruction?
 - (7) Privacy: How will data be safeguarded to protect the rights of individuals to privacy?
 - (8) Cost: How should data-related costs be controlled? To which sets of data and information needs should scarce resources be allocated?
- (c) The flowchart is given on the next page.

Symbols used in the flowchart:

- C.A.W.L. – Clear all working locations
- NS – Name of the student
- D – Discipline code
- NM – No. of Medical students
- NE – No. of Engineering students
- NS – No. of Science students
- NA – No. of Arts students
- NOS – Total number of students
- TR – Total revenue
- PRM – Percentage revenue from Medical discipline
- PRE – Percentage revenue from Engineering discipline
- PRS – Percentage revenue from Science discipline
- PRA – Percentage revenue from Arts discipline.

Question 4

- (a) Describe 'Ring Network' as a network topology. Also mention its advantages and disadvantages.
- (b) Define an Operating System and discuss its various functions.
- (c) Write various steps involved to perform Mail-Merge.
- (d) Write the steps for creating a new macro on MS-EXCEL. (5 + 5 + 5 + 5 = 20 Marks)



Answer

- (a) In Ring network, the network cable passes from one node to another until all nodes are connected in the form of a loop or ring. There is a direct point-to-point link between two neighbouring nodes. These links are unidirectional which ensures that transmission by a node traverses the whole ring and comes back to the node, which made the transmission.

Advantages

- (1) Ring network offers high performance for a small number of workstations.
- (2) It can span longer distances compared to other types of networks.
- (3) These networks are easily extendable.

Disadvantages

- (1) Ring network is relatively expensive and difficult to install.
- (2) Failure of one computer on the network can affect the whole network.
- (3) It is difficult to trouble shoot a ring network.
- (4) Adding or removing computers can disrupt the network.

- (b) Operating Systems are devised to optimize the man-machine capabilities. This may be defined as an integrated system of programs, which supervises the operation of CPU, controls the input/output functions of computer system and provides various support services. Without loading the operating system into the memory of the computer system, the computer cannot be used. There are six basic functions that an operating system can perform:

- (1) Job scheduling - Operating system decides the sequence in which different jobs are executed, using priorities established by the organization.
- (2) Manage hardware and software resources - Operating system helps in loading the application program into the primary memory and helps the various hardware units to perform as specified in the application program.
- (3) Maintain system security - Operating system identifies the authorized users by recognizing the password entered by the user and authorizes the user to have access to the system.
- (4) Enable multiple user resource sharing - Operating system can handle the scheduling and execution of the application programs for many users at the same time (multiprogramming).
- (5) Handle interrupts - An interrupt is a technique used by the operating system to temporarily suspend the processing of one program in order to allow other programs to be executed. Interrupts are issued when a program requests an operation that does not require the CPU, such as input/output or when the program exceeds some predefined time limit.

- (6) Maintain usage records - Operating system can keep track of the amount of time used by each user for each resource - processor, memory, input/output devices. Such information is usually maintained for the purpose of charging for the use of organization's computing resources.
- (c) Mail Merge is a tool for producing repetitive documents. It gives flexibility while sending letter and then personalizing each copy of it with information such as names, addresses, dates etc. For establishing Mail Merge, two documents need to be created, i.e. the main document and the data source. Following steps are followed to set-up Mail Merge:
 - (1) Setting up the Main Document.
 - (2) Setting up the Data Source.
 - (3) Editing the Data Source.
 - (4) Addition of fields to the Main Document.
 - Place the cursor in the Main Document where we want our first field to appear.
 - Activate the 'Insert Merge Field' button from the Mail Merge toolbar.
 - From the list, select the field that we would like to place first.
 - Take the cursor to the next line.
 - Click the 'Insert Merge Field' and select the next field. Continue doing this until we get all the required fields on our main document.
- (d) Steps for creating a new Macro on MS-EXCEL: Before proceeding to create a macro in MS-Excel, first decide the steps that are supposed to be performed by the macro. Following steps are then carried out:
 - (1) Select 'Tools/Macro' option from the main menu.
 - (2) Select 'Record New Macro' option from the cascading menu. It would display 'Record Macro' dialog box.
 - (3) Give the name of the macro in 'Macro Name' box.
 - (4) After assigning a name, give a keyboard shortcut to it, which is absolutely at the discretion of the user. Such a shortcut is assigned only if the user wishes to execute the macro using a keyboard.
 - (5) Next proceed to 'Store Macro in' box. The macro can be stored in the current workbook or other workbook by selecting 'This Workbook' or 'New Workbook' option respectively from the drop-down list.
 - (6) In the 'Description' box, relevant details/notes about the macro can be put.
 - (7) When all the relevant details are filled in the 'Record Macro' dialog box, click <OK> button. A small 'Stop Recording' toolbar will appear on the screen.
 - (8) Now proceed to record the macro. Just perform all the essential steps to complete the specified task.
 - (9) The macro is now ready to be executed.

Question 5

- (a) Describe the language tools offered in MS-WORD to aid writing.
- (b) Define the following functions used in MS-EXCEL:
- (i) DB ()
 - (ii) COUNTIF()
 - (iii) INT ()
 - (iv) CLEAN ()
 - (v) NPV ().
- (c) Give an account of the benefits of 'Electronic Commerce' application and implementation.
(5 + 5 + 10 = 20 Marks)

Answer

- (a) Word offers several useful tools to aid writing and increase efficiency, some of them are mentioned as follows:
1. AutoCorrect: AutoCorrect is a feature which is used to get automatic corrections for the commonly mistyped words using an inbuilt dictionary. The dictionary contains the correct spelling of the word with which MS-Word should replace the mistyped word. End users can make new entries or edit existing entries in the dictionary as per their requirement.
 2. AutoText: AutoText allows the user to store formatted text, paragraphs and graphics which can be recalled by pressing some keys. AutoText has an AutoComplete tip that will complete the text without having to type the entire word.
 3. Spelling and Grammar: Word automatically corrects/provides suggestion for any wrong word or words not found in the dictionary. The grammar function is a relatively new feature of Word and the users may use the feature to get a good second opinion on their language.
 4. Thesaurus: Thesaurus is a book in which words and phrases of similar meaning are grouped together, which the users can use to choose the word/phrase of their choice.
 5. Find and Replace text: 'Find' helps to locate specific text in a document while 'Replace' helps to substitute it with new text. The user has an option of replacing all words with one keystroke if he/she is sure that all the entries of that word need to be replaced.
- (b) (i) DB (): It is a financial function which returns the depreciation of an asset for a specified period using the fixed-declining balance method.
Syntax of the function is:
DB(cost, salvage, life, period, month)

where,

'cost' is the initial cost of the asset.

'salvage' is the value at the end of the depreciation.

'life' is the number of periods over which the asset is being depreciated.

'period' is the period for which you want to calculate the depreciation.

'month' is the number of months in the first year. If month is omitted, it is assumed to be 12.

- (ii) COUNTIF (): It is a statistical function which counts the number of cells within a range that meet the given criteria.

Syntax of the function is:

COUNTIF(range, criteria)

where,

'range' is the range of cells from which you want to count cells.

'criteria' is the criteria in the form of a number, expression, cell reference, or text that defines which cells will be counted.

- (iii) INT (): It is a mathematical function which rounds a number down to the nearest integer.

Syntax of the function is:

INT (number)

where,

'number' is the real number you want to round down to an integer.

- (iv) CLEAN (): It is a text function which removes all nonprintable characters from text.

Syntax of the function is:

CLEAN(text)

where,

'text' is any worksheet information from which you want to remove nonprintable characters.

- (v) NPV (): It is a financial function which calculates the net present value of an investment by using a discount rate and a series of future payments (negative values) and income (positive values).

Syntax of the function is:

NPV (rate,value1,value2, ...)

where,

'rate' is the rate of discount over the length of one period.

'value1, value2, ...' are 1 to 29 arguments representing the payments and income.

- (c) Following are the benefits of Electronic Commerce application and its implementation:
- (i) Reduced costs to buyers and suppliers by accessing on-line databases – Costs to buyers have reduced due to increased competition in procurement as more suppliers are able to compete in an electronically open marketplace. Even suppliers can electronically access on-line databases of bid opportunities, on-line abilities to submit bids, and on-line review of rewards, thereby reducing their costs.
 - (ii) Reduced time to complete business transactions – Since each and every transaction, from delivery to payment, can be done electronically; the time taken to complete these transactions has reduced substantially.
 - (iii) Creation of new markets through the ability to reach potential customers – As tens of millions of people are currently using Internet and the number is increasing day-by-day; business via Internet has opened the door to new markets and easy-to-reach potential customers.
 - (iv) Reduced errors, time and overhead costs in information processing – By eliminating the requirements for re-entering data in processing of information, the overhead costs, errors and time have reduced.
 - (v) Better quality of goods as specifications are standardized and competition has increased, and improved variety of goods through expanded markets and the ability to produce customized goods exist.
 - (vi) Reduced inventories and reduction of risk of obsolete inventories – As the demand for goods and services is electronically linked through just-in-time inventory and integrated manufacturing techniques, the holding and ordering costs of inventories have also gone down.
 - (vii) Ability to undertake major global programs in which the cost and personnel needed to manage a non-automated system would be unreasonable or prohibitive.
 - (viii) Improved market intelligence and strategic planning – Business via Internet serves as a useful tool to search for information about competitors, customers and suppliers. This information helps in managerial decision-making and strategic planning.
 - (ix) Equal access to market for all categories of businessmen – The use of a public network-based infrastructure can “level the playing field” for both small and large businesses. This allows companies of all sizes to extend their reach to a broad customer base.
 - (x) Reduced overhead costs through uniformity, automation and large scale integration of management processes.

- (xi) Reduced delivery cost – Especially for goods that can also be delivered electronically, the cost of delivery has reduced.
- (xii) Reduced design and manufacturing cost – With the use of CAD and CAM technology, better products can be designed faster and manufactured at lower costs.
- (xiii) Reduced advertising cost – Products and services can now be advertised on the home pages of the organizations. Even queries can be attended to by advising the potential customers to access the information on the web site of the organization, rather than responding them with brochures and literature.
- (xiv) Faster time to market as business processes are linked, enabling seamless processing and eliminating the delays.
- (xv) Optimization of resource selection – As businesses form cooperative teams to increase the chances of economic successes, and to provide the customer products and capabilities more exactly meeting his or her requirements; resource selection process has been optimized.
- (xvi) Reduced use of ecologically damaging materials through electronic coordination of activities and the movement of information rather than physical objects.
- (xvii) Customer involvement in product and service innovation has increased.

Question 6

- (a) What are the objectives of introducing IT Act, 2000?
- (b) How is digital signature created? Describe it.
- (c) *Mention uses of CAATs. What factors should be considered in determining whether to use CAATs? (5 + 5 + 10 = 20 Marks)

Answer

- (a) Following are the objectives of introducing IT Act 2000:
 - (1) To grant legal recognition for transactions carried out by means of electronic data interchange and other means of electronic communication commonly referred to as 'electronic commerce' in place of paper based methods of communication.
 - (2) To give legal recognition to Digital Signature for authentication of any information or matter which requires authentication under any law.
 - (3) To facilitate electronic filing of documents with Government departments.
 - (4) To facilitate electronic storage of data.
 - (5) To facilitate and give legal sanction to electronic fund transfers between banks and financial institutions.

* There was a typographical error in the Question Paper. CAATs was misprinted as CATTs.

- (6) To give legal recognition for keeping books of account by Bankers in electronic form.
 - (7) To amend the Indian Penal Code, the Indian Evidence Act-1872, the Bankers' Book Evidence Act-1891 and the Reserve Bank of India Act-1934.
- (b) The digital signature is created in two distinct steps as follows:
- (1) First the electronic record is converted into a message digest by using a mathematical function known as "hash function". This function digitally freezes the electronic record thus ensuring the integrity of the content of the intended communication contained in the electronic record. Any tampering will immediately invalidate the digital signature.
 - (2) Secondly, the identity of the person affixing the digital signature is authenticated through the use of a private key, which attaches itself to the message digest. This can be verified by anyone who has the public key corresponding to such private key. This will enable anybody to verify whether the electronic record is retained intact or has been tampered with since it was so fixed with the digital signature. It will also enable the person having public key to identify the originator of the message.
- (c) CAATs may be used in performing various auditing procedures, including:
- (1) Tests of details of transactions and balances – for example, the use of audit software to test all, or a sample of the transactions in a computer file.
 - (2) Analytical review procedures - for example, the use of audit software to identify unusual fluctuations or items.
 - (3) Compliance tests of general EDP controls - for example, the use of test data to test access procedures to program libraries.
 - (4) Compliance tests of EDP application controls - for example, the use of test data to test the functioning of a programmed procedure.

The use of computer-assisted audit techniques (CAATs) in an organization primarily depends upon the following factors:

- (i) Computer knowledge, expertise and experience of the auditor: The auditor should have sufficient knowledge to plan, execute and use the results of the particular CAAT adopted.
- (ii) Availability of CAATs and suitable computer facilities: The auditor should consider the availability of CAATs, suitable computer facilities and the necessary computer-based accounting systems and files.
- (iii) Impracticability of manual tests: Many computerized accounting systems perform tasks for which no visible evidence is available and, in these circumstances, it may be impracticable for the auditor to perform tests manually.

- (iv) Effectiveness and Efficiency: The effectiveness and efficiency of auditing procedures may be improved through the use of CAATs in obtaining and evaluating audit evidence.
- (v) Timing: Where the time available to perform an audit is limited, the auditor may plan to use a CAAT, as it will meet his time requirement better than other procedures.

Question 7

Write short notes on any four of the following:

- (i) Voice Recognition
- (ii) Touch Screen
- (iii) Data File Interrogation
- (iv) Clip Gallery
- (v) Enhanced features of 'Power Point'. (5 × 4 = 20 Marks)

Answer

- (i) Voice Recognition: Voice Recognition is a process in which the voice is translated into text and stored in a digital form. Using this process, one can speak to the computer rather than having to type. The user can also control the computer with oral commands, such as, 'Shut Down' or 'Print Report'. Voice Recognition software takes the smallest individual sounds in a language, called phonemes, and translates them into text. Two major challenges in the area of voice recognition is, first, a sound can have different meanings that makes reliability of translation difficult and second, distinguishing between meaningful sound from the background noise.
- (ii) Touch Screen: In touch screen, by pressing a finger against a function or program displayed on the screen, information / instruction / input is provided to the system. It is a Hewlett Packard innovation and was introduced in 1984. Bank ATMs are a very good example of this technology. Nowadays, this technology is being used at various places, such as, hotels, stock exchanges, railways, flight booking, etc. In this technology, an invisible microwave beam 'matrix' criss-crosses the screen, emanating from holes along the bottom and sides of the display unit. When we touch the screen using finger, the infrared beam is broken at that intersection and the system gets activated.
- (iii) Data File Interrogation: Data File Interrogation is a method which is used to interrogate financial data files. It is a form of substantive testing, as it involves the direct examination of transactions and balances. Using this method large volume of transactions can be examined and manipulated and information can be extracted in a much efficient way thus enabling the scope of audit testing to be increased significantly. The work is carried out faster and more accurately. Moreover, the clerical audit work can be devoted to an examination of those items which are defined in the interrogation program as significant for audit purposes. Therefore, the work is concentrated on testing rather than selection.

- (iv) Clip Gallery: Clip Gallery is a collection of multimedia effects available in MS-WORD. Multimedia effects such as sound and videos are particularly welcomed by the users. The clips can be used in the following manner:

Insert Clip: Select 'Insert/Picture/Clipart'. A dialog box 'Microsoft Clipart Gallery' will appear on the screen. Select 'Clipart' tab on it and then choose the category. In the adjoining window all the related clips can be found. The user can search through and select the appropriate clip and click at the <Insert>button. The clip selected will be placed in the document, at the cursor position.

Resizing Clip: The clip on the document may not be of the desired size. It can be resized. The user can select the clip by clicking anywhere on it. Eight sizing handles appear on the boundary of the clip. On taking pointer to a desired handle, the pointer gets changed into a double-headed click. The user can click and drag the handle in the desired direction. When the required size is achieved, the mouse pointer can be released.

- (v) Enhanced Features of 'Power Point': Enhanced features of Power Point include the following:
- (1) Modifying the impact of slides – Power Point offers many design options to suit various presentation needs. For instance, objects, graphical bullets and animation can be inserted to a slide. We can also insert sound and video to play in the slide show. By using transitions, presentation's visual impact can be modified.
 - (2) Adding Objects – Objects like clip arts, WordArt, tables and charts can be inserted on selected or all slides. For this purpose, Slide view or Normal view is used.
 - (3) Creating Graphical Bullets – Power Point supports a variety of bullets to enhance the look and clarity of the presentation. Apart from the regular bullets that are available in the 'Bullets and Numbering' dialog box, more bullets can be viewed and chosen by clicking the <Character> button. Bullets can be created from any picture file also. It is also possible to change the color and size of the bullets.
 - (4) Adding Transitions and Animation – Power Point offers several special effects and features that can enhance an online presentation. We can use things such as slide transitions, timings, movies, animation etc. Transition can be set with the help of Slide Transition dialog box. It is possible to adjust the speed of the transition by selecting the options button. Slide transitions can also be accompanied with sound effects which can be chosen from the drop-down list of Sounds in the Transition dialog box. Animation can be included on individual slides depending on the content of the slide. Using this feature, title, text, charts and any other graphics can be animated.