

PAPER – 6 : INFORMATION TECHNOLOGY

QUESTIONS

1. Convert the following from one number system to another along with the working notes:
  - (i)  $(123.5)_{10} = ( \quad )_2$
  - (ii)  $(234.56)_8 = ( \quad )_{10}$
  - (iii)  $(1101101.111)_2 = ( \quad )_{10}$
  - (iv)  $(D321)_{16} = ( \quad )_{10}$
  - (v)  $567.43_8 = ( \quad )_{16}$
  - (vi)  $(123.625)_{10} = ( \quad )_2$
  - (vii)  $(1101101.0101)_2 = ( \quad )_{10}$
  - (viii)  $(B2C)_{16} = ( \quad )_{10}$
  - (ix)  $(15AE)_{16} = ( \quad )_{10}$
  - (x)  $(7523)_8 = ( \quad )_{16}$
2. Describe briefly, the following terms with reference to Information Technology:
  - (i) Program data dependence
  - (ii) Utility routines
  - (iii) Dumb Terminal
  - (iv) Firmware
  - (v) GUI
  - (vi) CMOS
3. Give one or two uses or reasons for each of the following:
  - (i) Use of Diagnostic programs
  - (ii) Use of interactive processing
  - (iii) Preference of Network model over hierarchical model
  - (iv) Bootstrap loader program
  - (v) Need for Master file
  - (vi) Use of Cache Memory
  - (vii) Use of Parallel port
  - (viii) Preference of relational database model with comparison to hierarchical database model.
  - (ix) Use of File pointer
  - (x) Need for repeaters
4. Write True or False for each of the following:
  - (i) Smart terminals are user programmable.
  - (ii) Windows 98 is a 16-bit operating system.
  - (iii) A folder is also called a directory.
  - (iv) Terminals that are directly connected to the computers are called hardwired terminals.
  - (v) Spooling overlaps the input, output and processing of different programs.
  - (vi) The width of the address bus determines the word length of the computer.
  - (vii) Buffering overlaps input, processing and output of different programs.
  - (viii) The power consumption of a dynamic RAM is less than that of a static RAM.

- (ix) Section 29 of IT Act 2000 deals with duties of certifying authorities.
- (x) Workstations are based on RISC architecture of the CPU.
- 5. Distinguish between the following:
  - (i) First Generation Computer and Second Generation Computer
  - (ii) Analog Computer and Digital Computer
  - (iii) Master File and Transaction File
  - (iv) Main Memory and Cache Memory
  - (v) MICR and OCR
  - (vi) Voice Synthesizer and Voice Recognition System
  - (vii) Compiler and Interpreter
  - (viii) Dumb Terminal and Intelligent Terminal
  - (ix) Static RAM and Dynamic RAM
  - (x) DDL and DML
  - (xi) Data bus and address bus
- 6. Write Short notes on the Following:
 

|                                |                      |
|--------------------------------|----------------------|
| (i) Operating System           | (ii) CPU             |
| (iii) Desktop Publishing       | (iv) CAD/CAM         |
| (v) Database Management System | (vi) Virtual Storage |
| (vii) Spooling                 | (viii) Multimedia    |
| (ix) Features of LAN           | (x) FTP              |
| (xi) URL                       | (xii) PPP            |
- 7. (a) Communication software is an essential requirement of Data Communication system. Explain the various functions of this Data Communication Software.
- (b) Explain the concept of communication protocols.
- 8. What do you understand by Local Area Network? Describe its basic components.
- 9. (a) What tools are available to protect the information in network against intrusion or misuse? Discuss.
- (b) Explain the salient features of INTRANET.
- 10. Define and explain various components of an Expert System?
- 11. (a) State the advantages of Database.
- (b) What do you mean by Structured Query Language (SQL)? Explain its utility in database management.
- 12. Discuss the several integrity controls that DBMS package supports.
- 13. A company has 2,500 employees. Their salaries are stored as J(s), 1,2,-----2500. The salaries are divided in four categories as under:
  - (i) Less than Rs. 1,000
  - (ii) Rs.1,000 to Rs. 2,000
  - (iii) Rs.2,001 to Rs. 5,000
  - (iv) Above Rs. 5,000

Draw a flowchart for finding the percentage of the employees in each category.

14. A hire purchases scheme has adopted the following criterion for its customers. The customers will get the credit facility if they satisfy any of the following conditions:
- The customer must hold the present job for more than 5 years and reside in the same place at least for 3 years. In this case, the customer will get credit up to rupees three thousand.
  - The monthly salary of the customer must exceed rupees two thousand and must hold the present job for more than 5 years. In this case credit will be given up to rupees four thousand.
  - The monthly salary must exceed rupees two thousand and reside at the same place at least for 3 years. In this case credit will be given up to rupees four thousand.
  - In the case, the customer's monthly salary exceeds rupees two thousand, holds the present job for more than 5 years and also reside in the same place at least for the 3 years, the credit facility will be upto rupees five thousand.
- The credit facility is rejected for all other customers. Prepare a decision table for this hire-purchasers scheme.
15. (a) Explain briefly the various features of Ms-Word.
- Text wrapping
  - Mail Merge
  - Formatting
  - Auto correct
  - Auto text
  - Spell Check
- (b) Define the following functions used in MS-Excel:
- DB
  - FV
  - NPV
  - PMT
  - IRR
  - COUNT (range)
  - STD (range)
  - MOD ( $x/y$ )
  - INT ( $x$ )
  - ROUND ( $x, n$ )
16. Discuss the important features of MS-POWER POINT.
17. Explain the main objectives of IT Act, 2000.
18. Describe the procedure to perform Computer Assisted Auditing using generalized audit package.
19. Explain the various facilities offered by a Standard accounting package.

#### SUGGESTED ANSWERS / HINTS

1. (i)  $(123.5)_{10} = (1111011.100)_2$
- (ii)  $(234.56)_8 \equiv (157)_{10}$
- (iii)  $(1101101.111)_2 = (109.875)_{10}$
- (iv)  $(D321)_{16} = (54049)_{10}$
- (v)  $(567.43)_8 = (177.8C)_{16}$
- (vi)  $(123.625)_{10} = ( )_2$
- | 2 | 123 | Remainder | Fractional part |
|---|-----|-----------|-----------------|
| 2 | 61  | 1         | .625×2=1.25     |
| 2 | 30  | 1         | .25×2=0.5       |
| 2 | 15  | 0         | .5×2=1.0        |
| 2 | 7   | 1         |                 |
| 2 | 3   | 1         |                 |
|   | 1   | 1         |                 |
- $(123.625)_{10} = (1111\ 011.101)_2$

$$\begin{aligned}
 \text{(vii) } (1101101.0101)_2 &= 1 \times 2^6 + 1 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + \\
 &\quad 1 \times 2^0 + 0 \times 2^{-1} + 1 \times 2^{-2} + 0 \times 2^{-3} + 1 \times 2^{-4} \\
 &= 64 + 32 + 0 + 8 + 4 + 0 + 1 + \frac{1}{4} + 0 + \frac{1}{16} \\
 &= (109.3125)_{10} \\
 \text{(viii) } (B2C)_{16} &= ( \quad )_{10} \\
 (B2C)_{16} &= 11 \times 16^2 + 2 \times 16^1 + 12 \times 16^0 \\
 &= 11 \times 256 + 2 \times 16 + 12 \times 1 = 2816 + 44 = 2860 \\
 \text{Hence, } (B2C)_{16} &= (2860)_{10} \\
 \text{(ix) } (15AE)_{16} &= ( \quad )_{10} \\
 (15AE)_{16} &= 1 \times 16^3 + 5 \times 16^2 + 10 \times 16^1 + 14 \times 16^0 \\
 &= 4096 + 1280 + 160 + 14 \\
 &= (5550)_{10} \\
 \text{(x) } (7523)_8 &= ( \quad )_{16} \\
 (7523)_8 &= 111 \quad 101 \quad 010 \quad 011 \\
 &= 1111 \quad 0101 \quad 0011 \\
 &= (F53)_{16}
 \end{aligned}$$

2. (i) Program data dependence: In conventional languages data and program are dependent on one another. Thus if changes are made in the format and structure of data and records in a file, changes have to be made in all the programs that use this file. This forces change of language or data file very difficult.
  - (ii) Utility routines: A standard routine used to assist in the operation of a computer by performing some frequently required process such as sorting, merging, file handling etc.
  - (iii) Dumb Terminal: The dumb terminal is a stand-alone device with keyboard and display screen that can send or receive data, but cannot process the data. It is simply a device that immediately transmits each keyed data character to the processor.
  - (iv) Firmware: Firmware or micro programs refer to a series of special program instructions. The most basic operations such as addition, multiplication etc. in a computer is carried out by hardwired circuits. These fundamental tasks are then combined in the form of micro programs to produce higher-level operations such as move data, make comparisons etc. These micro-programs are called firmware because they deal with very low-level machine operations and thus essentially substitute for additional hardware. Firmware is held in the CPU in a special control storage device.
  - (v) GUI: Graphical user interface is latest technique to improve man machine interaction, working on the age old fact "a picture is worth thousand words". It is better method as compared to text based control interaction. User gets relieved of remembering cumbersome text commands. A graphical command screen is superimposed over the current screen using icons, which can be selected by the mouse or keyboard by pointing on to them. Thus, it also becomes syntax insensitive. Due to its self guiding capability, it is being considered more users friendly and therefore most of the new software is essentially incorporating GUI's instead of being command driven.
  - (vi) CMOS (Complementary Metal Oxide Semiconductor): Personal computer uses the CMOS memory to store the date, time and system setup parameters. These parameters are loaded every time the computer is started. It is powered by lithium ion battery.
3. (i) Use of Diagnostic programs: These are referred as debugging routines or aids. A diagnostic routine is a program that is invoked to provide information or assistance to a

programmer on those occasions when his program fails to operate correctly.

(ii) Use of interactive processing:

- (a) Here there is a continuous interaction between user and the machine, therefore it is possible to provide the intermediate results to the user.
- (b) The cost of this system is higher, as interactive devices need to be provided.

(iii) Preference of Network model over hierarchical model:

- Network model permits many to one and many to many which is not supported by hierarchical model
- Network model is relatively flexible than hierarchical model.

(iv) Bootstrap loader program:

- These are programs stored in ROM to bring the operating system from secondary storage to primary storage when the computer is switched on.
- This makes the computer system operational and provides responses to user commands.

(v) Need for Master file:

- Relatively permanent.
- Master files of past become historical files.
- Historical Files are used for comparison purposes e.g., sales analysis.
- Master file is updated using transaction file.

Examples: Payroll Master file, Inventory Master file, Student Master file, etc.

(vi) Use of Cache Memory: The Cache memory acts as a temporary memory and boosts processing power significantly. The cache that comes with the processor is called level one (L1) cache. This cache runs at the processor's clock speeds, and therefore, is very fast. The L1 cache is divided into two sections – one for data, and other for instructions.

(vii) Use of Parallel Port: Parallel ports are used to connect external input/output devices like scanners or printers. Parallel ports facilitate the parallel transmission of data, usually one byte at a time. Parallel ports use 25 pin Rs. 232C.

(viii) Preference of relational database model with comparison to hierarchical database model : A relational database is structured into a series of two dimensional tables. It allows flexibility in conducting database queries and creating reports. The link between data elements need not to be made explicit at the time the database is created. It is more flexible and provides managers with rich opportunity for ad-hoc reports and queries. In case of hierarchical data base, hierarchy of records must be determined and implemented before a search can be conducted.

(ix) Use of File pointers: File pointers establish linkage between records and are a basic part of the file organization of all the database models except the relational model. A pointer is the address of another related record that is "pointed to". The pointer directs the computer to that related record. It is placed in the last field of a record, if more than one pointer is used, then in the last fields.

(x) Need for a repeater in a network: Repeaters are used to amplify the signal between the sending and receiving stations. Their purpose is to keep the intensity of the signal at the required level. When signal travels long distance, its strength becomes feeble due to cross talk and other electromagnetic interferences. Hence repeaters are used to maintain the intensity at the original level.

4. (i) False (ii) False  
(iii) True (iv) True

- (v) True                      (vi) False  
 (vii) False                  (viii) True  
 (ix) False                   (x) True

5. (i) First Generation Computer and Second Generation Computer

| First Generation Computer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Second Generation Computer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Uses vacuum tubes</li> <li>• Very large in size</li> <li>• Requires air conditioning</li> <li>• Input–punched card reader</li> <li>• Output–card punches</li> <li>• I/O devices are very slow</li> <li>• There is a speed disparity between processor and I/O devices</li> <li>• Power consumption is more</li> <li>• Used for scientific and business applications</li> <li>• Generates more heat and reliability is very less</li> <li>• Very costly</li> <li>• Centralized data processing</li> <li>• 1945–1955</li> <li>• OS–Simple Monitor programs</li> </ul> <p>Examples: IBM-650, UNIVAC</p> | <ul style="list-style-type: none"> <li>• Uses transistors</li> <li>• Small in size when compared with vacuum tubes</li> <li>• Input–magnetic tape</li> <li>• Output–magnetic tape</li> <li>• I/O Devices are faster</li> <li>• There is a speed disparity between processor and I/O devices. But it is less when compared with first generation computers.</li> <li>• Power Consumption is less</li> <li>• Used mostly for Business applications</li> <li>• Produces less heat and reliability is more</li> <li>• Relatively cheaper</li> <li>• Decentralized data processing</li> <li>• 1956–1965</li> <li>• OS–Batch operating system</li> </ul> <p>Examples: IBM–1401</p> |

(ii) Analog Computer and Digital Computer

| Analog Computer                                                                                                                                                                                                                                                                                                                                                                                                                                 | Digital Computer                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Accepts input in continuous format</li> <li>• Accuracy is less</li> <li>• Storage capacity is less</li> <li>• It is cheaper</li> <li>• Used in Scientific Applications</li> <li>• Programming is Easy</li> <li>• Peripheral devices employed are cheaper</li> </ul> <p>Examples of input: Temperature, Pressure, Voltage</p> <p>Examples of applications: Food processing and petroleum refineries</p> | <ul style="list-style-type: none"> <li>• Accepts input in discrete format or non-continuous format</li> <li>• Accuracy is more</li> <li>• Storage capacity is more</li> <li>• Costlier</li> <li>• Used in business applications</li> <li>• Complexity in programming</li> <li>• Peripheral devices used are costlier</li> </ul> <p>Examples of Inputs: Characters, Numbers, etc.</p> <p>Examples of applications: Payroll, Inventory, Banking, etc.</p> |

(iii) Master File and Transaction File

| Master File                                                                                                                                                                                                                                                                                                                                                     | Transaction File                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Relatively permanent</li> <li>• Master files of past become historical files</li> <li>• Historical Files are Used for Comparison purposes–sales analysis</li> <li>• Examples: Payroll Master file, Inventory Master file, Student Master file, etc</li> <li>• Master file is updated using transaction file</li> </ul> | <ul style="list-style-type: none"> <li>• Used to record day to day transactions</li> <li>• Temporary in nature</li> <li>• Used for updating the master file</li> </ul> <p>Examples: Daily transaction files in Bank, Inventory Transaction, Sales Transaction, etc.</p> |

(iv) Main Memory and Cache Memory

| Main Memory                                                                                                                                                                                                                                                                                   | Cache Memory                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Temporary Memory</li> <li>• Memory capacity of the order of Mega Bytes</li> <li>• Accessing time is more</li> <li>• Cheaper</li> <li>• Improves the CPU performance reasonably</li> <li>• Main memory is between Secondary memory and CPU</li> </ul> | <ul style="list-style-type: none"> <li>• Temporary memory</li> <li>• Memory capacity of the order of Kilo Bytes (512 kb)</li> <li>• Accessing time is very less</li> <li>• Very costly</li> <li>• 10 times faster than the main memory</li> <li>• Improves the CPU Performance significantly</li> <li>• Cache memory is between primary or main memory and CPU</li> </ul> |

(v) MICR and OCR

| MICR                                                                                                                                                                                                                                                                                                                                                                                                                                                     | OCR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Magnetic Ink Character Recognition</li> <li>• Used as input device</li> <li>• Uses Standard set of characters for printing purpose</li> <li>• Characters are printed using a special Ink which contains magnetic materials</li> <li>• Used in banking for cheque facility</li> <li>• High reading accuracy</li> <li>• No favor from business circle</li> <li>• It cannot be used for output purposes</li> </ul> | <ul style="list-style-type: none"> <li>• Optical Character Recognition</li> <li>• Used as input device</li> <li>• Uses a Standard set of characters for printing purpose</li> <li>• Characters are read by using Light scanning technique</li> <li>• Can read both upper case and lower case letters</li> <li>• High reading accuracy, used for large volume of transactions</li> <li>• Rigid input requirements regarding specifications and size of fonts to be used.</li> <li>• May not be economical when volume of transaction is less.</li> </ul> <p>It cannot be used for output purposes</p> |

(vi) Voice Synthesizer and Voice Recognition System

| Voice Synthesizer                                                                                                                                                                                                                                                                                                                                                                             | Voice Recognition System                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Voice Synthesizer</li> <li>• Known as voice-output device.</li> <li>• Converts data in main storage to vocalized sounds understandable to humans</li> <li>• Speed and pitch can be usually adjusted</li> <li>• Used in voice output presentation, multimedia presentation and children education software</li> <li>• Relatively expensive</li> </ul> | <ul style="list-style-type: none"> <li>• Voice Recognition System</li> <li>• Presents the user with a hand-free voice interactive computer interface</li> <li>• User can discard conventional input devices such as keyboard or a mouse and access the computer system by simply talking to it.</li> <li>• Designed for the physically disadvantaged and non-typists people.</li> <li>• Very effective and are extremely well received by inexperienced user</li> <li>• Expensive</li> </ul> <p>Example: Text Dictation, Single command voice menu option.</p> |

(vii) Compiler and Interpreter:

| Compiler                                                                                                                                                                                                                                                                                                                                                                                      | Interpreter                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Translates the high level language called Source Program to the Machine level language called Object Program as a whole.</li> <li>• The object program is permanent</li> <li>• Not Interactive</li> <li>• Time taken is less</li> <li>• Error correction is difficult</li> <li>• More storage space is required</li> </ul> <p>Examples: C, Cobol</p> | <ul style="list-style-type: none"> <li>• Translates the source program to object program line by line</li> <li>• Object program is temporary</li> <li>• Interactive</li> <li>• Time taken is more</li> <li>• Error Correction is easy</li> <li>• Less storage space is required</li> </ul> <p>Example: Basic</p> |

(viii) Dumb Terminal and Intelligent Terminal

| Dumb Terminal                                                                                                                                                                                                                                                                               | Intelligent Terminal                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• I/O Device for data entry</li> <li>• No inbuilt processing capability</li> <li>• No microprocessor</li> <li>• No programming</li> <li>• Load on main server CPU is more</li> <li>• Can't act as stand alone terminal</li> <li>• Cheaper</li> </ul> | <ul style="list-style-type: none"> <li>• Inbuilt processing capability</li> <li>• End user programmable</li> <li>• Contains a microprocessor</li> <li>• Some data processing activities such as sorting, summarizing, checking can be performed</li> <li>• Reduces the load on the main server CPU</li> <li>• May be used as a stand alone terminal</li> <li>• Costlier</li> </ul> |

(ix) Static RAM and

| Static RAM                                                                                                                                  | Dynamic RAM                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• It is called SRAM</li> <li>• Faster</li> <li>• Larger in size</li> <li>• More Expensive</li> </ul> | <ul style="list-style-type: none"> <li>• It is called DRAM</li> <li>• Types: EDO DRAM, FPM, SDRAM, RDRAM</li> <li>• Slower</li> <li>• Compact in size</li> </ul> |

|                                                                                                                                                                                                   |                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Refreshing is not needed</li> <li>• Retains the data as long the power is on</li> <li>• Power Consumption is more</li> <li>• Uses transistors</li> </ul> | <ul style="list-style-type: none"> <li>• Less expensive</li> <li>• Refreshing is needed to retain the content</li> <li>• Retains the data only for a few milli seconds</li> <li>• Power consumption is less</li> <li>• Uses capacitors</li> </ul> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

(x) DDL and DML

| DDL                                                                                                                                                                                                        | DML                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DDL or Data Definition Language describes schema and subschema, describes the fields and data type in each record, indicates the keys for each record and provides logical and physical data independence. | DML or Data Manipulation Language provides the techniques for data manipulation such as deletion, retrieval sorting etc., independence of programming languages, provides the use of record relationship. |

(xi) Data Bus and Address Bus

| Data Bus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Address Bus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Data Bus is an electric path or group of parallel wires that connects CPU, memory and other hardware devices on the motherboard for the purpose of transmission of data.</p> <p>Data bus is designed to match the capabilities of the devices attached to it. If a CPU could send and receive only one byte of data at a time, there is no need to connect the CPU to a bus that could transfer more than 8 bits of data at a time. Presently 64-bit data bus is being used for transfer of data from 64-bit CPU.</p> | <p>It is a set of wires that connects CPU and RAM and carries the addresses of the memory locations from where data can be retrieved or stored. Number of wires in the bus affects the speed at which data can travel between hardware components. On the data bus, each wire can transfer one bit at a time. Eight-wire buses can transfer eight bits simultaneously. Similarly, 16-bit bus can transmit two bytes simultaneously.</p> <p>Number of parallel wires in the address bus determines the maximum number of memory locations the CPU can address. For example, with an eight-bit address bus, CPU can address maximum 256 memory locations. Today, CPUs have 32-bit address bus that can address 4GB memory locations.</p> |

6. (i) Operating System: An operating system performs a very important role in a computer system. It is a complex group of programs written in machine language that enables a computer to schedule work in the most efficient way. It consists of two basic types of programs – a supervisor program and a collection of other programs that are under the control of the supervisor. The Operating system supervises the overall operation of the computer, controls the flow of jobs in and out of the system, switches I/O peripherals in and out and calls programs from storage. The operating system manages assembly, compilation and execution of programs based on data furnished with each program. In case of error conditions, the operating system undertakes errors diagnosis and recovery techniques. It minimizes the operators intervention and hence provides tremendously fast computer speed.

Disk Operating System: Basically an OS is a group of programs that act as an interface between the operator and the computer. It is a silent partner when we are using the computer. An appropriate example here would be of electricity, which has to be there if we need to run any electrical appliances or gadgets, like toaster, iron etc. Similarly, the OS has to be in the background to perform a kind of computer operations like Basic programming,

word processing, financial accounting etc. A computer is nothing but a dead machine without the operating system.

Disk Operating System (DOS) is the OS developed for disk-drives. For IBM-PC compatibles, we talk about DOS since all the I/O operations are performed through disks/disk drives.

MS-DOS is the name of the generic operating system, which is used on almost all of the non-IBM machines. MS is the abbreviation of Microsoft Corporation, a company that has done pioneering work in software development and operating systems. PC-DOS is the property of IBM and can only be available from IBM with IBM-PC only. All other PCs use MS-DOS.

UNIX: It is a multi-user, multi-tasking operating system that is being used with several powerful 16 bit or 32 bit personal computers. It was first developed at Bell Laboratory in 1969 for large machines.

- (ii) CPU: The heart of any computer is the CPU. It is this central processor that makes comparison, performs calculations, reads, interprets and controls the execution of instructions. It consists of three separate components

1. The control unit
2. The arithmetic and logical unit
3. Primary Storage

The control unit, as the name implies, supervises the operations of the entire computer. It selects one program statement from the storage unit, interprets the statement and sends appropriate electronic impulses to the ALU and storage units to carry out the required operations. Thus, the control unit does not perform the actual processing on the data. Rather, its function is to maintain order and to direct the flow of sequence of operations and data within the computer.

The control unit also instructs the input devices when to start and stop transferring data to storage unit, and it tells the storage unit when to start and stop transferring data to output devices. Hence, it acts as a central nervous system for the component parts of the computer. ALU performs mathematical calculations, compares numeric and non-numeric values and makes decisions. The data flows between this unit and the storage unit during processing.

Specifically, data is transferred as and when needed from the storage unit and returned to the storage unit. The storage or primary memory section of the computer consists of the devices used to store the information which will be used during computations. The storage section of the CPU is also used to hold both intermediate and final results as the computer executes the program.

- (iii) Desktop Publishing: The use of desktop publishing system is growing rapidly in business these days. Desktop publishing systems combine computers and suitable peripherals with software that can produce attractive page layouts complete with pictures and text printed in a variety of type faces or fonts. With latest developments, even general purpose PC can be used to run off-shelf desktop publishing packages. These packages give PC's many of the general capabilities found in dedicated publishing systems. However, both types of systems accept digitizer text and picture input, both accept data imported from word-processors, page formatting and graphic files; both allow users to create, edit, format, and enter text and graphics into documents. A clip art library – a file of ready to use pictures is included in many publishing packages. After final decision on text, pictures, headings, borders and other document features have been reached, the output of a publishing package can be sent to a laser or other graphic printers or phototype-setting or other output machines that can communicate with the package. Often a page description language is used to permit communication between the package and output devices.

- (iv) CAD/CAM: This is a very fast developing field. These science and the engineering techniques that have evolved are based on computer processing method known as digitizing. This means that computers have been programmed to assign digital values to graphic information to process and store these records. Engineering or structural drawings can be read from actual paper documents or entered into tables or terminal screen by drafters. The computer can accept and manipulate these graphics entries as workable data files. Outputs are re-interpretation of the data and can be delivered on video displays, drawings developed on plotters, three dimensional models build by machine tools. With CAD/CAM techniques, it has become possible to shorten greatly the time and to improve procedure for developing and building sophisticated new products. For example, aircrafts are now designed on computer systems and test flown for hundreds of hours before a model is even constructed. The overall time for the development of the airplane is reduced by many months, possibly years.
- (v) Database Management System: Database Management System (DBMS) are large s/w packages that perform most of the tasks involved with data structures, data storage and data retrieval. Using DBMS, data transactions are introduced in the system only once reducing the data redundancy. This database becomes a neutral resource with respect to any particular program and is application independent, i.e. the specific data elements are readily available as needed to all authorized applications. There is no need to enter a transaction in various files according to the respective format. Hence data redundancy is reduced. All database records affected by a transaction are updated at the time of input. Thus fewer errors may occur as several records are updated simultaneously.

DBMS also controls access to the data base, provides database security, locates and passes data to application programs, and does housekeeping for the files such as adding and deleting records and reorganizing the records. It thus reduces file updating problems. The database administrator is a coordinator between the database and its users. He works very closely with the users in order to create, maintain and safeguard the data base.
- (vi) Virtual Storage: It allows the programmer to use secondary storage to store programs that requires more primary storage than that is available. Parts of the program in use are brought from secondary storage to primary storage when they are needed. These parts of program are referred to as "page". Only those program pages that are currently to be used are needed in primary storage. When a page is no longer needed, the primary storage that it occupies can be reused for some other purpose. Virtual storage relieves the programmer of dividing his/her program to fit into an inadequately sized primary storage.
- (vii) Spooling: Spooling is an acronym for Simultaneous Peripheral Operations On/Off Line. This technique was first devised by Houston Corporation USA. Hence it is referred as HASP, Houston Automatic Spooling Program. Spooling allows the CPU to process data at maximum speed without waiting for slow output devices. In spooling, the CPU records the output on an intermediate storage device such as a magnetic disk. The jobs are transferred to the output devices when these units are ready. Assume for example that four line printers and a disk unit are used in a spooling operation on a computer system. A control program co-ordinates assignment of jobs to the output devices. Data are fed at maximum speed from the CPU, stored on the disk and sent to slower devices for output as the devices become available. As a result, the CPU can output at maximum speed while several relatively slow output units operate simultaneously to process it. Spooling can also be used to buffer jobs.
- (viii) Multimedia: A computer technology that combines several different forms of computer output is called multimedia. This term is used to describe a system consisting of hardware, software and such other devices as televisions, video monitors, compact disk systems or stereo systems responsible to produce a full audio and visual presentation. Multimedia enables computer users to obtain information in a much richer form than conventional tabular and graphical media. Users can view three-dimensional images, still photographs, full motion video and / or animation. In addition, they can listen to stereo sound, voice recording or music.

Multimedia provides the user with a variety of input/output options. Visual images can be entered into the system from software packages, which incorporate digital photography from video cameras, video tapes and disks, and optical scanners. Whereas audio inputs can be entered by means of microphones, tapes, cassettes and compact disks, visual outputs can be screened on the TV monitors. Voice can be heard through speakers and headsets.

Multimedia is very useful to promote the product and to educate and train employees. Each computer based information system (CBIS) is the potential user of multimedia, which offers the opportunity to expand conventional outputs beyond printouts and displays.

(ix) Features of LAN:

- (i) *Compatibility*: A local area network operating system must provide a layer of compatibility at the software level so that software can be easily written and widely distributed. A LAN operating system must be flexible, which means that it must support a large variety of hardware.
- (ii) *Internetworking*: Bridging of different LANs together is one of the most important requirements of any LAN. Users should be able to access resources from all workstations on the bridge network in a transparent way, no special commands should be required to cross the bridge. A network operating system must be hardware independent, providing the same user interface irrespective of the hardware.
- (iii) *Protected mode operation*: An important feature that a LAN operating system must have is the ability to operate in the protected mode of a processor. Protected mode, as opposed to a real mode, allows the processor to access up to 16 MB of RAM and to gain more power from the microprocessor.
- (iv) *Growth path and modularity*: One of the most important requirements of a LAN is its modularity. A set of PCs should get easily converted into a LAN which can grow in size simply by adding additional workstation. If more storage is required, one should be able to add another hard disk drive, or another server.
- (v) *System reliability and maintenance*: All computers are prone to system lockups, power failures and other catastrophes. If a centralized processing system goes down, all users connected to it are left without a machine to work on. Such a situation can arise even in a distributed or local area network system. However, a LAN operating system should be powerful enough to withstand accidents.

The main features of LAN are

- Inexpensive transmission media
- Inexpensive devices (modems, repeaters and transceivers)
- Easy physical connection of devices to the media
- High data transmission rates
- Network data transmission are independent of the rates used by the attached devices, making it easier for devices of one speed to send information to device of another speed.
- A high degree of interconnection between devices.
- Every attached device having the potential to communicate with every other devices on the network
- There is seldom a central controlling processor which polls the attached device on the network
- In the majority of cases, each attached device heard (but does not process) messages intended for other devices.

- (x) FTP: FTP refers to File Transfer protocol. It is a common method of moving files between two Internet sites. There are many publicly accessible sites from where information can be obtained using FTP.
- (xi) Uniform Resource Locators: Uniform Resource Locators are used by Web Browsers to address and access individual web pages, web sites and Internet resources. The format of a URL is as given below:  
Protocol/Internet address/web page address  
Example : <http://www.icai.org/seminars.html>
- 7 (a). Communication software manages the flow of data across a network. They are written to work with a wide variety of protocols which are rules and procedures of exchanging data. Following functions are performed by the communication software:
  - (i) Access Control:
    - Linking and disconnecting different devices
    - Automatic dialing and answering telephones
    - Restricting access to authorized users only
    - Establishing parameters like speed, mode and direction of transmission.
  - (ii) Network Management:
    - Polling devices to see whether they are ready to send or receive data
    - Queuing input and output
    - Determining system priorities
    - Routing messages
    - Logging network activity, use and errors.
  - (iii) Data and File Transmission that the data sent is indeed the data received.
  - (v) Data Security: Protecting data; controlling the transfer of data, files and messages among the various devices.
  - (iv) Error detection and control: Ensuring during transmission from unauthorized access.
- (b) Communication protocols are sets of rules or conventions that must be adhered to by both the communicating parties to ensure that the information being exchanged between them is received and interpreted correctly. A protocol defines the following three aspects of digital communication.
  - (i) *Syntax* – The format of data being exchanged, character set used, type of error correction used, type of encoding scheme being used.
  - (ii) *Semantics* – Type and order of messages used to ensure reliable and error-free information transfer.
  - (iii) *Timing* – Define data rate selection and correct timing for various events during data transfer.

Communication protocols are defined in layers, the first of which is the physical layer or the manner in which node in a network are connected to one another. Both the network software and network-interface card have to adhere to a network protocol. The RS-232 C connector is the standard for some communication protocols. Subsequent layers, the number of which vary between protocols, describe how messages are packaged for transmission, how

messages are routed through network, security procedures and the manner in which messages are displayed.

A number of different protocol codes are in use. For example, X.12 is the standard for electronic data interchange (EDI). X.75 is used for interconnection between networks of different countries, and XMODEM is used for uploading and downloading files. The set of most common protocols used on the Internet is called TCP/IP.

8. Local area network: Computer network is a collection of computers and technical devices connected together by a communication system. A local area network (LAN) is primarily a data transmission system intended to link computers and associated devices within a restricted geographical area such as an office building or several adjacent buildings. The linked computers and related equipments may be anything from full-scale mainframe computing systems to small desktop office workstations, terminals and peripherals etc. The key characteristic of a local area network is the fact that the whole of the network, confined to one site, is completely under the control of one organization. Organisations use LANs because they enable multiple users to share software, data and devices. LANs use a shared physical media, which is routed in the whole campus to connect various systems. LAN uses high-speed media (1Mbps to 30 Mbps or more) and are mostly privately owned and operated.

Local area network has following five components:

- (i) File Server: A network file server is a computer system used for the purpose of managing the file system, servicing the network printers, handling network communications, and other functions. A server may be dedicated in which case all of its processing power is allocated to network functions, or it may be non-dedicated which means that a part of the server functions may be allocated to a workstation or DOS-based system.
  - (ii) The network operating system: It is loaded into the server's hard disk along with the system management tools and user utilities. When the system is restarted, NetWare boots and the server comes under its control.
  - (iii) Workstations: Workstations are attached to the server through the network interface card and the cabling. Workstations are normally intelligent systems, such as the IBM PC. The concept of distributed processing relies on the fact that personal computers attached to the networks perform their own processing after loading programs and data from the server. Hence, a workstation is called an Active Device on the network. After processing, files are stored back on the server where they can be used by other workstations.
  - (iv) Network interface card: Every device connected to a LAN needs a Network interface card (NIC) to plug into the LAN. For example, a PC may have an Ethernet card installed in it to connect to an Ethernet LAN.
  - (v) Network Cabling: Once the server, workstations and network interface cards are in place, network cabling is used to connect everything together. The most popular type of network cable is the shielded twisted-pair, co-axial and fiber optic cabling.
9. (a) The following tools are available to protect the information in a network against intrusion or misuse :
    - (i) **Firewalls:** Firewalls are systems that control the flow of traffic between the Internet and the firm's internal LANs and systems. They are usually packaged as turnkey hardware/software packages and are set up to enforce the specific security policies that are desired. A firewall is a proven and effective means of protecting the firm's internal resources from unwanted intrusion.

To accomplish this:

- All traffic between the outside network and the organization's intranet must pass through the firewall.
- Only authorized traffic between the organization and the outside, as specified by formal security policy, is allowed to pass through the firewall.

- The firewall must be immune to penetration from both outside and inside the organization.
  - (ii) *Encryption*: Encryption allows information to transit the Internet while being protected from interception by eavesdroppers. There are two approaches to encryption:
    - (a) *Hardware encryption devices* – If the Internet is being used to exchange information among branch offices, for instance, use of hardware encryption can ensure that all traffic between these offices is secure.
    - (b) *Software encryption* is employed in conjunction with specific application. For example, certain electronic mail packages provide the facility of encryption and decryption for message security.
  - (iii) *Message Authentication*: It makes sure that message is really from whom it purports to be and that it has not been tampered with. Regardless of a company's individual needs, clearly defined Internet security policies and procedures should always be part of any corporate Internet security strategy.
  - (iv) *Site Blocking*: It is a software-based approach that prohibits access to certain websites that are deemed inappropriate by management. In addition to blocking sites, companies can also log activities and determine the amount of time spent on the Internet and identify the sites visited.
  - (b) The salient features of INTRANET:
    - Intranet is a type of information system that facilitates communication within the organization, among widely dispersed departments, divisions and regional locations.
    - It connects people together with Internet technology using Web Browsers, Web Servers and Data Warehouses in a single view.
    - Access to all information, applications and data can be made available through the same browser. Easily accessible information, reduced information searching time, share and reuse of tools and information, reduced set up and update time, reduced documentation cost, etc can be performed.
    - Applications: Supplier Management, Inventory Management, Distribution Management, and Channel Management.
10. An expert system (ES) is a computerized information system that allows non-experts to make decisions comparable to those of an expert. Expert systems are used for complex or ill-structured tasks that require experience and specialized knowledge in narrow, specific subject areas. It contains the following components:
- **Knowledge Base**: This includes the data, knowledge, relationships, rules of thumb (heuristics), and decision rules used by experts to solve a particular type of problem. A knowledge base is the computer equivalent of all the knowledge and insight that an expert or a group of experts develop through years of experience in their field.
  - **Inference engine**: This program contains the logic and reasoning mechanisms that simulate the expert logic process and deliver advice. It uses data obtained from both the knowledge base and the user to make associations and inferences, form its conclusions, and recommend a course of action.
  - **User Interface**: This program allows the user to design, create, update, use and communicate with the expert system.
  - **Explanation facility**: This facility provides the user with an explanation of the logic the expert system used to arrive at its conclusion.
  - **Knowledge acquisition facility**: Building a knowledge base, referred to as knowledge engineering involves both a human expert and a knowledge engineer. The knowledge

engineer is responsible for extracting an individual's expertise and using the knowledge acquisition facility to enter it into the knowledge base.

Expert systems offer the following benefits:

- They provide a cost effective alternative to human experts.
- They can outperform a single expert because their knowledge is representative of numerous experts. They are faster and more consistent and do not get distracted, overworked or stressed out.
- They produce better-quality and more consistent decisions. Expert systems assist users in identifying potential decision making problems, which increase the probability that sound decisions will be made.
- They can increase productivity.

11. (a) Advantages of Database:

- (i). Data is input once only, thereby eliminating duplication of input.
- (ii) Most types of database reduce data redundancy, which makes updating easy and less error-prone and saves processing effort and storage space.
- (iii) Data can be retrieved very quickly.
- (v). Confidentiality of information is attained by the use of passwords which restrict access to the whole, or part, of a data base to authorized personnel.
- (v). Data can be stored at high speed and searched in accordance with defined parameters.
- (vi). Special report layouts can be generated according to specific needs.
- (vii). Labels and letters can be printed.
- (ix). Records can be browsed through on the display screen.
- (x). Data can be subjected to calculations.
- (xi) Database facilitates the integration of system.

(b) SQL is a query language - a set of commands for creating, updating and accessing data from database. It allows programmers, managers and other users to ask *ad hoc* questions of the database interactively without the aid of programmers. It is a set of about 30 English like commands such as Select.....From.....Where.

SQL has following features:

- simple English like command;
- command syntax are easy;
- can be used by non-programmers;
- can be used for different type of database management systems;
- allows user to create, update database;
- allows retrieving data from data base without having detailed information about structure of the records and without being concerned about the processes the DBMS uses to retrieve the data;
- has become standard practice for DBMS.

Since SQL is used in many database management systems, managers who understand SQL syntax are able to use the same set of commands regardless of the DBMS software that they may use. Thus learning SQL provides managers with access to data in many database management systems.

12. Data Integrity Controls (i.e. controls on the possible value a field can assume) can be built into the physical structure of the fields. In order to have the correct database, DBMS needs to have

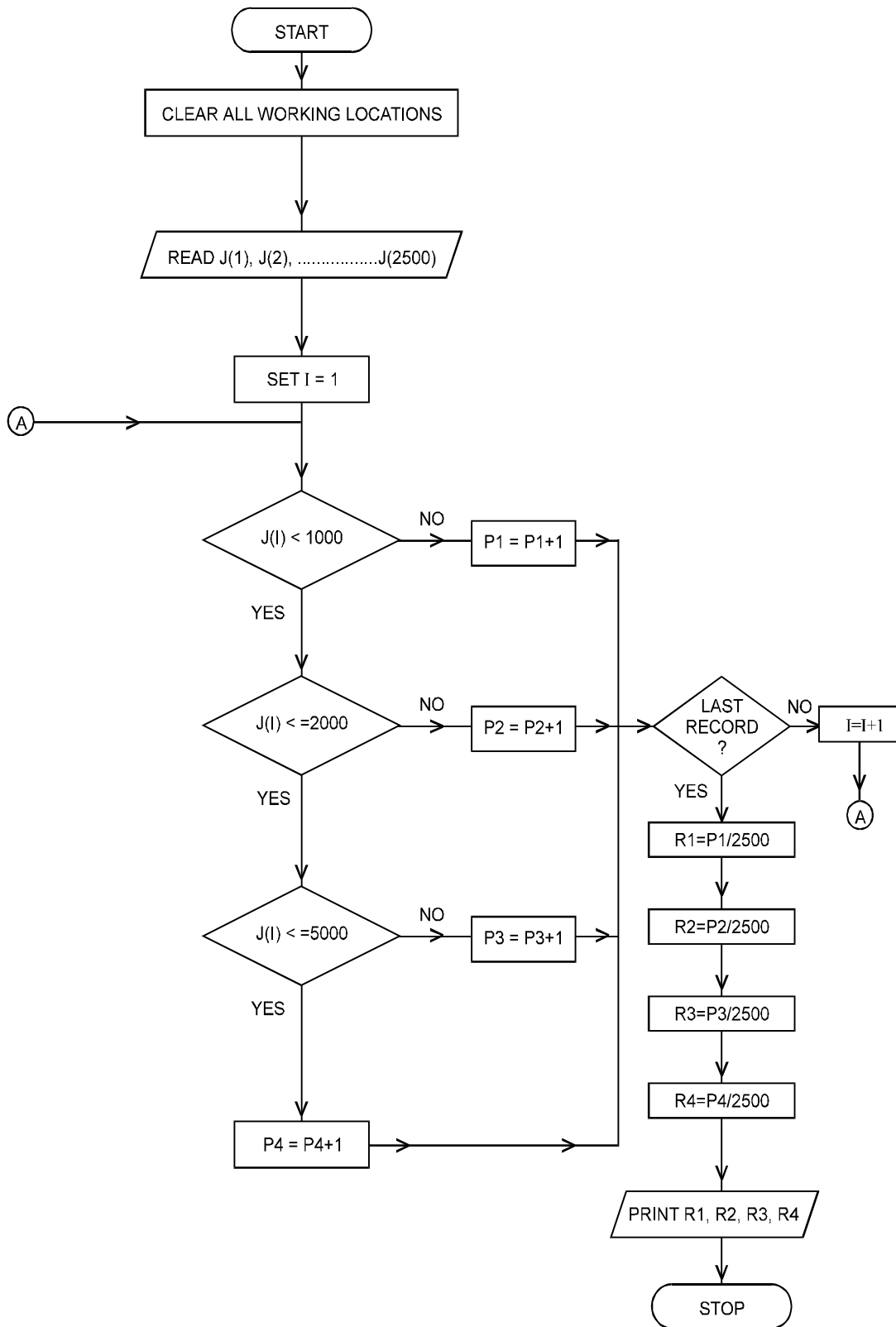
certain controls on the data fields. Some of the integrity controls that DBMS may impose on data fields are as follows:

- (i) *Data type*: In the data field, the data type defines the type of data to be entered in the field. It may be numeric, character, alphanumeric, etc.
- (ii) *Length of data field*: The length of data field defines the maximum number of characters or digits (depending upon the data type) to be entered in the data field.
- (iii) *Default Value*: It is the value a field will assume unless a user enters an explicit value for an instance of that field. Assigning a default value to a field can reduce data entry time and entry of a value to that field can be skipped. Default value helps in reducing the probability of data entry errors for most common values.
- (iv) *Range control*: This limits the set of permissible values a field can assume. The range may be numeric lower to upper bound or a set of specific value. Range control must be used with caution since the limits of range may change with time. A combination of range control and coding led to Y2K problem, in which a field for the year was represented by only the numbers 00 to 99. It is better to implement any range controls through a DBMS since range controls in programs may be inconsistently enforced and it is more difficult to find and change them.
- (v) *Null Value Control*: Null value is an empty value. Each primary key field must have an integrity control that prohibits a null value. Any other required field may also have a null value control placed on it depending upon the policy of organization. For example, a university may prohibit adding a course to its database unless that course has a title as well as a value to the primary key, Course-ID. Many fields legitimately may have null values so this control is to be used only when truly required by business rules.
- (vi) *Referential Integrity*: This control on a field is a form of range control in which the value of that field must exist as the value in some field in another row of the same or different table. That is, the range of legitimate values comes from the dynamic contents of a field in a data base table, not from some pre-specified set of values. Referential integrity guarantees that only some existing cross-referencing value is used, not that it is the correct one.

13. The required flow chart is given on the next page.

14. The decision table for the above problem is:

| Hire purchase Scheme                                    | R1 | R2 | R3 | R4 | R5 | R6 | R7 |
|---------------------------------------------------------|----|----|----|----|----|----|----|
| 1. Customer holds the present job for more than 5 years | Y  | Y  | Y  | Y  | N  | N  | N  |
| 2. Resides in the same place Y at least for 3 years     | Y  | N  | N  | Y  | Y  | N  |    |
| 3. Monthly salary of the customer exceeds Rs. 2000      | Y  | N  | Y  | N  | Y  | N  |    |
| 1. Give credit upto Rs. 3000                            |    |    | X  |    |    |    |    |
| 2. Give credit upto Rs. 4000                            |    |    |    | X  |    | X  |    |
| 3. Give credit upto Rs.5000                             |    | X  |    |    |    |    |    |
| 4. Reject credit                                        |    |    |    | X  |    | X  | X  |



15. (a) (i) Text wrapping : Unlike a typewriter, in WORD we do not have to press the Enter key to go to the next line. Word automatically starts a new line whenever the text reaches the right margin of the page. This is called text wrapping.
- (ii) Mail Merge: Mail merge is an efficient and less time consuming way of preparing mass mailing for a list of addresses. It is a tool for producing repetitive documents. It gives the flexibility while sending letter and then personalizing each copy of it with information such as names, addresses, dates etc.
- Mail merge is built around two sets of components- main document and the data source. The main document is a form letter. It contains merge fields where data would be merged. The field names would be replaced with the field contents coming from data source at the time of merging. The data source is a file that contains information to be merged with the main document to create a final product. The data source can be picked from Access database, Excel spread sheet or address book or one created in MS-Word.
- (iii) Formatting: It is used to make a document look good. Word offers a wide variety of formatting features as stated below to enable the user to choose the options that best suit the user's requirements:
- § Modify font
  - § Title-letter spacing
  - § Numbers and bullets
  - § Section breaks and page breaks
  - § Headers and footers
  - § Drop cap
  - § Indenting and line spacing
- (iv) Auto Correct: It has dictionary of its own which contains a list of commonly mistyped words, short names and phrases. MS Word automatically makes corrections of such words. It also acts as a valuable shortcut tool. One can save the trouble of typing long names or phrases by placing a short cut code in Auto Correct and allowing it to be expanded automatically. For example, one could use the code 'BOS' in auto correct and it can be expanded to 'Board of Studies'.
- (v) Auto Text: Auto text is a unique feature of MS WORD. It allows the user to store formatted text, even paragraphs and graphics. These can be recalled by pressing some keys. It also has an Auto Complete tip that will complete the text without having to type the entire word. However, Auto Text has to be explicitly called to allow it to work.
- (vi) Spell Check: The spell checking function checks each word in the text against the dictionary and underlines it with a red curly line if a word with wrong spelling appears or word is not found in the dictionary. The user on running the spell check function will be able to get the right spelling and rectify it. The spelling check function can be customized to user needs. The Word allows the user to set the manner in which the checks on spelling ought to be made.
- (b) Various functions are defined below:
- (i) DB: It returns the depreciation of an asset for a specified period using the fixed declining balance method.
  - (ii) FV: It is a financial function, which calculates the future value for a series of equal investments (also called annuity) earning a fixed periodic rate of interest.
  - (iii) NPV: This function returns net present value of an investment based on discount rate and a series of future payments.
  - (iv) PMT: It is a financial function that is used to calculate the loan payments based on the rate of interest, term of the loan and the principal amount.

- (v) IRR: This function gives internal rate of return for a series of cash flows.
- (vi) COUNT: It is a statistical function, which counts the number of arrangement values in the specified list. Empty cells are ignored/not counted.
- (vii) STD (range): It is a statistical function which calculates standard deviation ('N' method) of the value specified in the list.
- (viii) MOD ( $x/y$ ): It is a mathematical function which computes the modules value of  $x/y$  that is the remainder that would be left when we divide  $x$  by  $y$ .
- (ix) INT: It is a mathematical function, which computes the integral part of the value. All fractional values are truncated and only the integral part of the value is retained.
- (x) ROUND ( $x, n$ ): It is also a mathematical function which rounds off the number  $x$  to  $n$  decimal places.

16. Important Features of MS-Power Point:

- (i) Creating a presentation: Microsoft Power Point offers four different ways of creating a presentation – using the auto content wizard, using a design template, using a blank slide or opening an existing presentation.
- (ii) View a slide: Power point 2000 offers five ways to view a slide viz., normal, outline, slide, slide sorter and slide views.
- (iii) Modifying the impact of slides: Power point offers you many different design options to suit various presentation needs. You can for instance add objects, graphical bullets and animation to your slides. You can also insert sound and video to play in your slide shows. You can modify the visual impact of a presentation by using transitions.
- (iv) Adding objects: Objects like clip arts, word art, tables and charts can be inserted on all slides or to selected slides. For instance, if you want to introduce your company logo in your presentation, you may like it to appear on all slides. You can insert objects to slides in the slide view or the normal view. The object you may want to introduce could be text, clip art, a table, chart, a video clip, a sound clip or some other object.
- (v) Creating Graphical Bullets: Apart from the regular bullets that are available in the bullets and numbering dialog box, you can also click the character button to view more bullet options. You can browse the option of bullets from the dropdown list of font sets displayed in the bullet dialog box. You can even change the color and size of the bullets.
- (vi) Adding transitions and animations: PowerPoint offers several special effects and features that can enhance the work of an online presentation. You can use things such as slide transitions, movies, animation etc. You can set transitions by viewing the slide transitions dialog box in the slide show menu. You can activate the slide transition option only by selecting a slide in the slide sorter view.

17. The main objectives of IT Act 2000:

- To facilitate electronic filling of documents with Government Department
- To facilitate electronic storage of data
- To facilitate and give legal sanction to EFT
- To give legal recognition to Digital signature
- To give legal recognition to E-Commerce.

18. Generalised Audit Packages (GAP): GAP are standard packages developed by software companies for the purpose of auditors for auditing data stored on computers. Typical steps in performing computer assisted auditing using audit package are:

- (i) Define the audit objectives.
- (ii) Identify the tests that the package will be required to do in order to assist the meeting of the audit objectives.

- (iii) Make out the package input forms for these tests.
  - (iv) Compile the package on the computer, clearing reported edit errors. There should be full edit of the parameter cards to execution (Step vii). Maintain security over the package and the audit tests at all times.
  - (v) If a program was used to add coded routines to the package, to fill out the input forms or to advise generally, his work must be tested.
  - (vi) Obtain copies of the application files to be tested.
  - (vii) Attend the execution of the package against the copy files.
  - (viii) Maintain security of the copy files and output until the tests have been fully checked out.
  - (ix) Check results of the test and draw audit conclusions.
  - (x) Interface the test results with whatever subsequent manual audit work has to be done.
19. The facilities offered by a Standard accounting package:
- (a) To Create company profile
  - (b) To maintain list of accounts (Single Group & Multiple Group)
  - (c) To Create ledgers (Single & Multiple)
  - (d) To create entries like voucher entry, sales entry, receipt, payment, journal entry, etc.
  - (e) To prepare reports like profit and loss account, Balance Sheet.
- For details, refer to Chapter 20 of the study material.