CLASS-XI

Work Book Cum Question Bank with Answers

INFORMATION TECHNOLOGY

SCHEDULED CASTES & SCHEDULED TRIBES
RESEARCH & TRAINING INSTITUTE (SCSTRTI)
ST & SC DEVELOPMENT DEPARTMENT
BHUBANESWAR

WORK BOOK CUM
QUESTION BANK WITH ANSWERS

INFORMATION TECHNOLOGY

CLASS - XI

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CONTENTS

Subject	*Page No.*
• Information Technology 1st Year Syllabus	1
• Question Pattern of CHSE	2
UNIT - I	
• Chapter at a Glance	5
• Group - A : Objective Type Questions	6
• Group - A : Answers	9
• Group - B : Short Type Questions	11
• Group - B : Answers	12
• Group - C : Long Type Questions	15
• Group - C : Answers	16
UNIT - II	
• Chapter at a Glance	27
• Group - A : Objective Type Questions	28
• Group - A : Answers	30
• Group - B : Short Type Questions	31
• Group - B : Answers	32
• Group - C : Long Type Questions	36
• Group - C : Answers	37
UNIT - III	
• Chapter at a Glance	43
• Group - A : Objective Type Questions	44
• Group - A : Answers	46
• Group - B : Short Type Questions	47
• Group - B : Answers	48
• Group - C : Long Type Questions	50
• Group - C : Answers	50
UNIT - IV	
• Chapter at a Glance	53
• Group - A : Objective Type Questions	54
• Group - A : Answers	55
• Group - B : Short Type Questions	56
• Group - B : Answers	57
• Group - C : Long Type Questions	58
• Group - C : Answers	58
• Sample Questions	63
• Sample Question Answers	65

INFORMATION TECHNOLOGY 1ST YEAR SYLLABUS

UNIT - 1 : INTRODUCTION TO COMPUTER SYSTEM

A) Hardware concepts : [10 periods] ..... 10 marks

I) Computer organisation : CPU, Memory (RAM & ROM & I /O), devices, communication bus, ports (serial parallel)

II) Input devices : Keyboard, Mouse,Light pen, touch screen, graphic tablets, joystick, microphone, OCR, OMR, scanner, smart card reader, BCR, MICR, BIOMETRIC sensors, web camera.

III) Output devices : Monitor/VDU, LED/LCD screen, television, printers (DMP, deskjet / inkjet/bubble jet printer, laser printer), plotter, speaker.

IV) Memory unit : Memory, types of memory, RAM(SDAM, DRAM), ROM(PROM, EPROM, EEPROM).

B) Types of software :

I) System software : [10 periods] ..... 10 marks

Operating systems, need for operating system, major functions of operating system, OS for Main frame, PC/ server, mobile services, language processors (assembler, interpreter & compiler)

II) Utility software : Compression tools, disk defragmenter, anti virus.

III) Application software : General purpose applicaton (word processor, spreadshet packages, presentation software, DBMS, IDE software), specific purpose application software (Inventory Management Software, Human Resource Management System (HRMS), Payroll systems, Financial Management System, Reservation System).

IV) Open source concepts : [7 periods] ..... 05 marks

Open source software, common foss/floss(GNU/LINUX, Firefox, Openoffice, java, NETBEANS, MYSQL), common open standards (www, html, xml, dhtml), indian language computing, character coding, unicode, different types of fonts (open type versus true type, static vs dynamic), entering language text (phonetic & key map based).

UNIT - 2 : INTRODUCTION TO PROGRAMMING : [45 periods] ..... 25 marks

I) Getting started with programming with IDE : [20 periods] ..... 11 marks

Introduction, rapid application development with ide, basic interface components (label, text field, text area, button, checkbox, radio button) devloping general application, getting familiar with java swing user interface components (frame, dialog, option pane, panal, scroll pane, label, text field, password field, text area, button, check box, radio button, combo box, list), basic components handling methods & properties (Set text (), gettext () Is Selected (), Set Selected ())

II) Programming fundamentals : [15 periods] ..... 10 marks

Data types, concept of data types, built in data types (byte, short, int, long, float, double, char, string, boolean), variables, declaring variables, naming a variable, assigning value to variables, integer object method (parse int), double object method (parse double, parse float), control structure, decision structure (if, if.... else, switch), looping structure (while, Do-While, for)

III) Programming guidelines : [10 periods] ..... 04 marks

General concepts, Modular approach, running and debuging programs, (syntax errors, runtime error, logical errors), problem solving procedures (understanding the problem, identifying minimum number of inputs required for output, breaking down problem into simple logical steps)

UNIT-3 : RELATIONAL DATABASE MANAGEMENT SYSTEM : [30 periods] ..... 20 marks

I) DBMS : [10 periods] ..... 10 marks

Introduction to data base concepts, Database, Relational database, Relation/ Table, Attribute/Field, Tuple/ Row, Data types, text (char, varchar), number (decimal, int/integer), date & time. Keys (candidate key, primary key, Alternate key, Foreign key), Examples of common database management tools for mobile devices.

II) Introduction to MYSQL : [13 periods] ..... 05 marks

(ANSI SQL 99 standard commands)

Classification of SQL commands, DML (Select, Insert, Update, Delete), DDL(Create, Drop, Alter), Creating & using a database (SQL Create command to create a database, Use command to select a database), creating a Table (Create command to create a table, DESC command to display a table structure, Insert command for inserting new rows), displaying table data (select command to select all the columns, selecting specific columns using arithmetic operators, operator precedence), Defining & using column alias, eliminating deplicate values from display using Distinct keyword, Limiting rows during selection using where clause using comparison operator (=, <, >, <=, >=, <>, BETWEEN, IN, LIKE (%,-)), and using Logical operators (AND, OR, NOT & correcting logical operator precedence).

UNIT -4 : IT APPLICATIONS : [7 periods] ..... 5 marks

I) E-GOVERNANCE : [4periods] ..... 3 marks

Definition, Benefit to citizens, its web sites & its social impact, e-governance challenges

II) E-learning : [3 periods]..... 2 marks

Defination, Benefit to students (learners), Benefit to teachers (Training Management), e-Learning websides & its social impact.

***

QUESTION PAPER DESIGN (FOR THEORY)

+2 1st Year Science

A. Very short Question : (1 Marks)

i)	Introduction to computer systems (4 question x 1 marks)	.....	4 marks
ii)	Types of software (2 question x 1 marks)	.....	2 marks
iii)	Getting started with programming using IDE (1 question x 1 marks)	.....	1 marks
iv)	Open source concept (1 question x 1 marks)	.....	1 marks
v)	Introduction to MY SQL (3 question x 1 marks)	.....	3 marks
vi)	IT Application (1 question x 1 marks)	.....	1 marks

B. Short question : (2 mark each)

i)	Introduction to computer system (1 question x 2 marks)	.....	2 marks
ii)	Type of software (2 question x 2 marks)	.....	4 marks
iii)	Programming using IDE (2 question x 2 marks)	.....	4 marks
iv)	Introduction to MY SQL (1 question x 2 marks)	.....	2 marks
v)	DBMS - (1 question x 2 marks)	.....	2 marks
vi)	IT Application (2 question x 2 marks)	.....	4 marks

C. Short question : (4 marks each)

i)	Introduction to computer system (1 question x 4 marks)	.....	4 marks
ii)	Type of software (1 question x 4 marks)	.....	4 marks
iii)	Open source concept (1 question x 4 marks)	.....	4 marks
iv)	DBMS (2 question x 4 marks)	.....	8 marks
v)	Programming fundamentals (1 question x 4 marks)	.....	4 marks
vi)	Programming guideline (1 question x 4 marks)	.....	4 marks

D. Long question : (6 marks each)

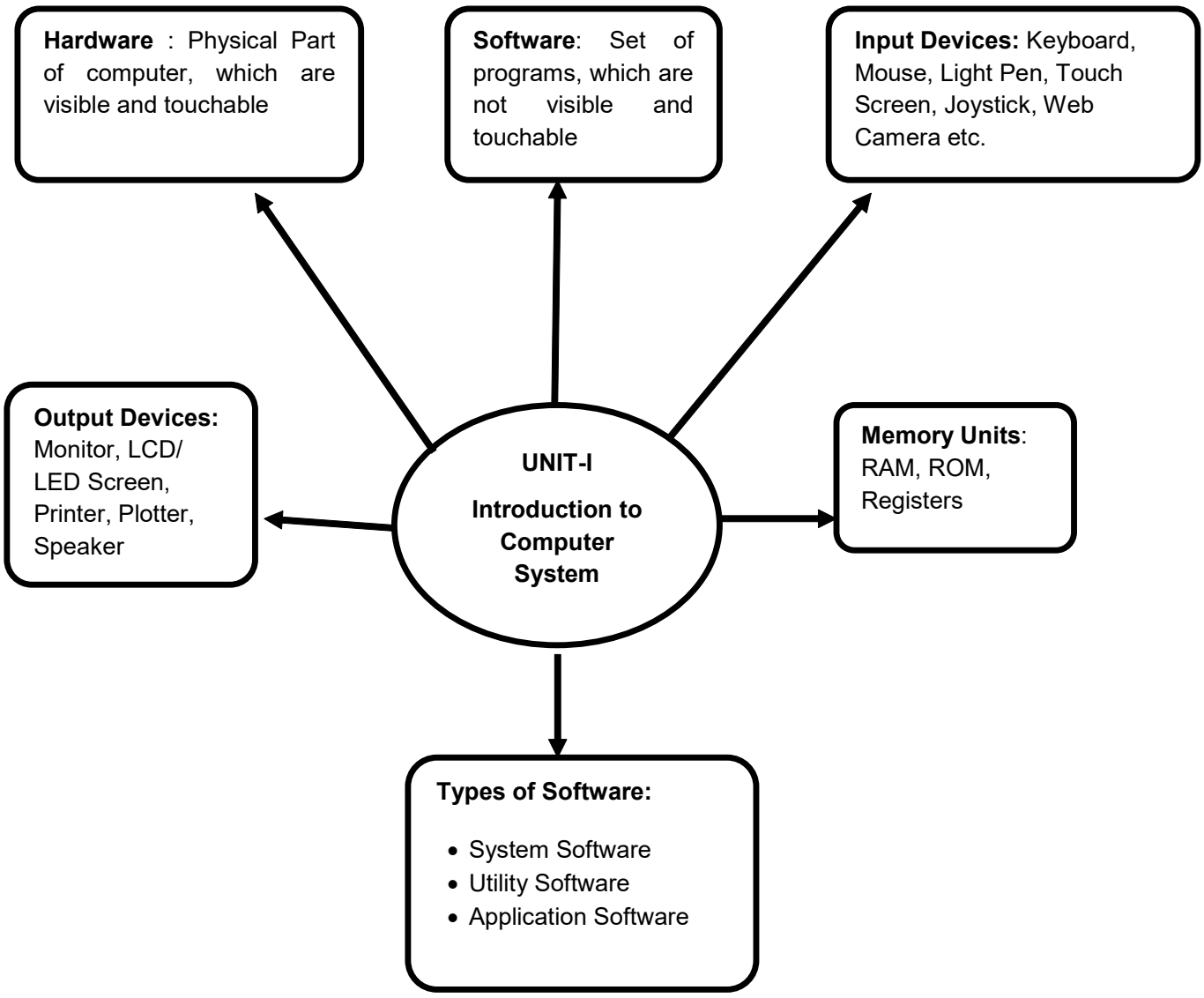
i)	Programming fundamentals (1 question x 6 marks)	.....	6 marks
ii)	Getting started with programming with IDE (1 question x 6 marks)	.....	6 marks

70 marks

UNIT - I

CHAPTER AT A GLANCE

INTRODUCTION TO COMPUTER SYSTEMS



UNIT - I

GROUP - A : OBJECTIVE TYPE QUESTIONS

1. Multiple Choice Questions

1. When the electrical power is disrupted or cut off, data and programs are lost in
   (a) ROM
   (b) Hard disk
   (c) RAM
   (d) Secondary storage

2. Read Only Memory (ROM)
   (a) is volatile
   (b) is non volatile
   (c) is a secondary memory
   (d) None of these

3. ALU is
   (a) Arithmetic Logic Unit
   (b) Array Logic Unit
   (c) Application Logic Unit
   (d) None of these

4. MICR stands for
   (a) Magnetic Ink Character Reader
   (b) Magnetic Ink Code Reader
   (c) Magnetic Ink Cases Reader
   (d) None of these

5. Which operation is not performed by computer?
   (a) Inputting (b) Processing
   (c) Controlling (d) Understanding

6. Which of the following is a secondary memory device?
   (a) Keyboard (b) Disk
   (c) ALU (d) All of these

7. The difference between RAM and Secondary Storage is that RAM is _____ and secondary storage is _____.
   (a) Temporary, Permanent
   (b) Permanent, Temporary
   (c) Slow, Fast
   (d) None of these

8. Which of the following registers holds the current instruction in the main memory ?
   (a) Accumulator Register
   (b) Data Register
   (c) Instruction Register
   (d) Input Register

9. _____ is called Brain of computer.
   (a) CPU (b) Memory
   (c) Hard disk (d) Keyboard

10. This unit performs all arithmetic and logic operations.
    (a) Control Unit
    (b) Arithmetic Logic Unit
    (c) Memory Unit
    (d) None of these

11. Interpreter converts a High Level Language program into machine level language by converting and executing:
    (a) In one go (b) Line by line
    (c) Group of five lines (d) None of these

12. Which of the following Operating System is suitable for handling more than one user at one time?
    (a) Multiprocessing OS
    (b) Multiuser OS
    (c) Multiprogram OS
    (d) Multiprogramming OS

13. 1 byte = _____ bit.
    (a) 4 (b) 8
    (c) 16 (d) 32

14. A bit stands for
    (a) Boolean Digit (b) Binary Digit
    (c) Binary Decimal (d) Byte Digit

15. Which of the following is not application software?
    (a) Word Processor
    (b) Anti Virus Program
    (c) Operating System
    (d) Railway Reservation System

16. Which of the following is not an utility software?
    (a) Text editor
    (b) Anti Virus Program
    (c) Compression software
    (d) Railway reservation System

17. Which of the following is not a component of Open Office?
    (a) Word (b) Impress
    (c) Calc (d) Writer

18. A program written in high level language is known as:
    (a) Source program (b) Main program
    (c) Object program (d) Image program

19. Which of the followings are Language processors?
    (a) Assembler (b) Compiler
    (c) Interpreter (d) All of above

20. Which of the following is a Special Purpose Application Software?
    (a) Word processor
    (b) Presentation Tool
    (c) Payroll Module
    (d) Build Automation Tool

21. _____ is a markup language that defines a set of rules for encoding documents in a format that is both human readable and machine readable.
    (a) HTML (b) DHTML
    (c) XML (d) None of these

22. Which of the following is a voting member of Unicode Consortium?
    (a) BSNL (b) C-DOT
    (c) C-DAC (d) DeitY

23. The JAVA programming language was developed by
    (a) John G Kemeny (b) Thomas A Kurtz
    (c) Dennis M Retchie (d) James Gosling

24. PHP is
    (a) An IDE
    (b) An operating system
    (c) A Server site Scripting Language
    (d) None of these

25. MYSQL is
    (a) An open source RDBMS
    (b) A Proprietary RDBMS
    (c) MS-Access
    (d) An apple RDBMS

26. DHTML is a
    (a) Common Open Standard
    (b) File extension
    (c) Web Browser
    (d) None of these

27. Which of the following is a hexadecimal Unicode for an Odia Number '1'?
    (a) B001 (b) 0B18
    (c) 0B67 (d) 0B99

28. Open Type Fonts are
    (a) 7-bit fonts (b) 8-bit fonts
    (c) 16 bit fonts (d) 32 bit fonts

29. NetBeans is an
    (a) Integrated Development Environment (IDE)
    (b) RDMBS
    (c) Operating System
    (d) None of these

30. Mozilla Firefox is a
    (a) Operating system (b) IDE
    (c) Web browser (d) None of these

2. *Expand the Followings:*

1. CPU
2. ALU
3. ROM
4. PROM
5. EPROM
6. EEPROM
7. RAM
8. SRAM
9. DRAM
10. HDD
11. SSD
12. DVD
13. CD-ROM
14. MMC
15. CFC
16. I/O
17. MAR
18. MDR
19. USB
20. VGA
21. LCD
22. GUI
23. LED
24. CMOS
25. OCR
26. OMR
27. MICR
28. CRT
29. OLED
30. BIOS
31. OS
32. DOS
33. CDAC
34. HLL
35. IDE
36. ASCII
37. DBMS
38. ODBC
39. OSS
40. OSI
41. WWW
42. JPEG
43. URL
44. HTML
45. DHTML
46. XML
47. API
48. ODF
49. TCP
50. IP
51. ICT
52. TDIL
53. MC&IT
54. ISCII
55. TTF
56. OTF

UNIT - I

GROUP - A : ANSWERS

1. Multiple Choice Questions

1. (c) RAM
2. (b) Is non volatile
3. (a) Arithmetic Logic Unit
4. (a) Magnetic Ink Character Reader
5. (d) Understanding
6. (b) Disk
7. (a) Temporary, Permanent
8. (c) Instruction Register
9. (a) CPU
10. (b) Arithmetic Logic Unit
11. (b) Line by line
12. (b) Multiuser OS
13. (b) 8
14. (b) Binary Digit
15. (c) Operating System
16. (d) Railway reservation System
17. (a) Word
18. (a) Source program
19. (d) All of above
20. (c) Payroll Module
21. (c) XML
22. (d) DeitY
23. (d) James Gosling
24. (c) A Server site Scripting Language
25. (a) An open source RDBMS
26. (a) Common Open Standard
27. (c) 0B67
28. (c) 16 bit fonts
29. (a) Integrated Development Environment (IDE)
30. (c) Web browser

2. Expand the Followings:

1. CPU : Central Processing Unit
2. ALU : Arithmetic & Logic Unit
3. ROM : Read Only Memory
4. PROM : Programmable ROM
5. EPROM : Erasable and Programmable ROM
6. EEPROM : Electrically Erasable and programmable ROM
7. RAM : Random Access Memory
8. SRAM : Static RAM
9. DRAM : Dynamic RAM
10. HDD : Hard Disk Drive
11. SSD : Solid State Disk
12. DVD : Digital Versatile Disc or Digital Video Disk
13. CD-ROM : Compact Disk-Read Only Memory
14. MMC : Multimedia Card

15. CFC : Compact Flash Card
16. I/O : Input /Output
17. MAR : Memory Address Register
18. MDR : Memory Data Register
19. USB : Universal Serial Bus
20. VGA : Video Graphics Array
21. LCD : Liquid Crystal Display
22. GUI : Graphical User Interface
23. LED : Light Emitting Diode
24. CMOS : Complimentary Metal Oxide Semiconductor
25. OCR : Optical Character Recognition
26. OMR : Optical Mark Recognition
27. MICR : Magnetic Ink Character Recognition
28. CRT : Cathode Ray Tube
29. OLED : Optical Light Emitting Diode
30. BIOS : Basic Input /Output System
31. OS : Operating System
32. DOS : Disk Operating System
33. CDAC : Centre for Development of Advance Computing
34. HLL : High Level Language
35. IDE : Integrated Development Environment
36. ASCII : American Standard Code for Information Interchange
37. DBMS : Database Management System
38. ODBC : Open Database Connectivity
39. OSS : Open Source Software
40. OSI : Open Source Initiative
41. WWW : World Wide Web
42. JPEG : Joint Photographic Expert Group
43. URL : Uniform Resource Locator
44. HTML : Hyper Text Markup Language
45. DHTML : Dynamic HTML
46. XML : eXtensible Markup Language
47. API : Application Programming Interface
48. ODF : Open document Format
49. TCP : Transmission Control Protocol
50. IP : Internet Protocol
51. ICT : Information and Communication Technology
52. TDIL : Technology Development for Indian Language
53. MC&IT : Ministry of Communication & Information Technology
54. ISCII : Indian Script Code for Information Interchange
55. TTF : True Type Fonts
56. OTF : Open Type Fonts

UNIT - I

GROUP - B : SHORT TYPE QUESTIONS

3. Short Questions to be answered within 30 words

(1) What is CPU?

(2) What is ROM?

(3) What is PROM?

(4) What is EPROM?

(5) What is Cache memory?

(6) What is Register?

(7) Define Clock Speed.

(8) What is BIOS?

(9) What is Software?

(10) What is Hardware?

(11) Define Multitasking OS.

(12) Define Multiprocessing OS.

(13) Define Multiuser OS.

(14) Define Multiprogramming OS.

(5) What is DBMS?

(16) What is Compiler?

(17) What is Interpreter?

(18) What is IDE?

(19) What is HTML?

(20) What is DHTML?

(21) What is XML?

(22) What is TCP/IP?

4. Short Questions to be answered within 50 words

(1) Name the types of primary storage devices.

(2) What are different types of software?

(3) Distinguish between Sequential access and direct access.

(4) What is the basic function of BIOS Chip?

(5) Why is it necessary to use ROM in a computer?

(6) What is the function of bus?

(7) What do you mean by bit and byte?

(8) Write down four major functions of an operating system.

(9) Explain different types of language processor.

(10) Differentiate between single user and multi user OS.

(11) Differentiate between compiler and interpreter.

UNIT - I

GROUP - B : ANSWERS

3. Short Questions to be answered within 30 words

(1) The Central Processing Unit (CPU) is the heart and brain of a computer. It receives data input, executes instructions, and processes information. It communicates with Input/output (I/O) devices, which send and receive data to and from the CPU.

(2) In computing, ROM stands for Read-Only Memory and refers to a type of memory used to store data or information in a permanent form. It is applied mainly in the distribution of firmware and semiconductor integrated circuits.

(3) Programmable ROM (PROM) is a form of digital memory. It is one type of ROM. The data in them are permanent and cannot be changed. PROMs are used in digital electronic devices to store permanent data. The key difference from a standard ROM is that the data is written into a ROM during manufacture, while with a PROM the data is programmed into them after manufacture.

(4) An Erasable Programmable ROM (EPROM) is a type of PROM chip that retains its data when its power supply is switched off. Computer memory that can retrieve stored data after a power supply has been turned off and back on is called non-volatile.

(5) Cache memory is an extremely fast memory type that acts as a buffer between RAM and the CPU. It holds frequently requested data and instructions so that they are immediately available to the CPU when needed. Cache memory is used to reduce the average time to access data from the Main memory.

(6) Register is one of a small set of data holding places that are part of the CPU. A register may hold an instruction, a storage address, or any kind of data (such as a bit sequence or individual characters). Some instructions specify registers as part of the instruction.

(7) Clock speed is the rate at which a processor can complete a processing cycle. It is typically measured in megahertz or gigahertz. One megahertz is equal to one million cycles per second, while one gigahertz equals one billion cycles per second.

(8) BIOS is firmware used to perform hardware initialization during the booting process, and to provide runtime services for operating systems and programs. The BIOS firmware comes pre-installed on a personal computer's system board, and it is the first software to run when powered on.

(9) Software is a set of instructions or programs that instructs a system for performing a task. In a layman example, if you consider your laptop then the monitor and keyboard are the hardware but the Operating System and the User Interface are the software. All the applications running on your laptop are also software.

(10) Computer hardware includes the physical parts of a computer which are visible and touchable. Ex- central processing unit, monitor, keyboard, computer data storage, graphics card, sound card, speakers and motherboard. By contrast, software is the set of instructions that can be stored and run by hardware

(11) Multitasking, in an operating system, is allowing a user to perform more than one computer task (such as the operation of an application program) at a time. The operating system is able to keep track of where you are in these tasks and go from one to the other without losing information.

(l2) A multiprocessing operating system is capable of running many programs simultaneously, and most modern network operating systems (NOSs) support multiprocessing. These operating systems include Windows NT, 2000, XP, and Unix.

(13) A multiuser OS is a computer system that allows multiple users that are on different computers to access a single system's OS resources simultaneously. Examples of a multi-user OS are UNIX and mainframe OS.

(14) Multiprogramming is a rudimentary form of parallel processing in which several programs are run at the same time on a uniprocessor. Since there is only one processor, there can be no true simultaneous execution of different programs. To the user it appears that all programs are executing at the same time.

(15) DBMS stands for Database Management System is software for storing and retrieving users' data by considering appropriate security measures. DBMS Provides security and removes redundancy. DBMS has many advantages over tradition file management system.

(16) A compiler is a translator that translate the source code from a high-level programming language to a lower level language in one go.

(17) An Interpreter is a translator that translates the source code from a high-level programming language to a lower level language line by line as well as executes it.

(18) An integrated development environment is a software application that provides comprehensive facilities to computer programmers for software development. An IDE normally consists of at least a source code editor, build automation tools and a debugger.

(19) HTML is the standard markup language for creating Web pages.HTML stands for Hyper Text Markup Language.HTML describes the structure of a Web page.HTML consists of a series of elements.HTML elements tell the browser how to display the content.HTML elements are represented by tags.

(20) Dynamic HyperText Markup Language (DHTML) is a combination of Web development technologies used to create dynamically changing websites. Web pages may include animation, dynamic menus and text effects. The technologies used include a combination of HTML, JavaScript or VB Script, CSS and the document object model (DOM).

(21) XML stands for eXtensible Markup Language.. XML is a markup language much like HTML. XML is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable.

(22) The Internet works by using a protocol called TCP/IP, or Transmission Control Protocol/ Internet Protocol. In base terms, TCP/IP allows one computer to talk to another computer via the Internet through compiling packets of data and sending them to right location.

4. Short Questions to be answered within 50 words

(1) The four main types of primary storage are:
(a) Register
(b) Cache memory
(c) Random Access Memory (RAM
(d) Read Only Memory (ROM).

(2) The four types of computer software include:
(a) System Software
(b) Application Software
(c) Malware
(d) Programming Software.

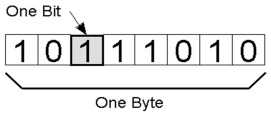
(3) Sequential access must begin at the beginning and access each element in order, one after the other. Direct access allows the access of any element directly by locating it by its index number or address.

(4) BIOS (Basic Input/output System) are the program a personal computer's microprocessor uses to get the computer system started after you turn it on. It also manages data flow between the computer's operating system and attached devices such as the hard disk, video adapter, keyboard, mouse and printer.

(5) ROM accounts for your memory needs to boot up your computer. ROM keeps data's even in the powered off stage of your computer which means no power is required for data storage.

(6) The system bus connects the CPU, memory, and the input/output devices. It carries data, address, and control information. The speed of the system bus is an important part of the performance of a computer system, just like the speed of the CPU and the size of the memory.

(7) A bit is the smallest data unit used in the computer. A bit can be a 0 or a 1. And a byte is the collection of 8 bits together, if we consider a bit as a box that can only store a binary value (0 or 1), then a byte is a collection of such 8 boxes creating a single data.



(8) The four major functions of an operating system are:
(a) Process management
(b) Memory management
(c) Disk Management
(d) File Management

(9) Different types of language processors are as follows:
(a) Compiler : A compiler is a program that converts the instructions of high-level language into machine language as a whole.
(b) Interpreter : An interpreter is a program that converts one statement of a program at one time.
(c) Assembler : An assembler is translating program that converts assembly language programs into machine language.

(10) The main difference between single user and multiuser operating system is that in a single user operating system, only one user can access the computer system at a time while in a multiuser operating system, multiple users can access the computer system at a time.

(11) The main differences between compiler and interpreter are listed below:
(a) The interpreter takes one statement then translates it and executes it and then takes another statement.
(b) Compiler generates the error report after the translation of the entire page while an interpreter will stop the translation after it gets the first error.
(c) Compiler takes a larger amount of time in analyzing and processing the high level language code comparatively interpreter takes lesser time in the same process.

UNIT - I

GROUP - C : LONG TYPE QUESTIONS

(1) Discuss Basic Computer Organisation and working of different components.

(2) Discuss different input devices used in computer system.

(3) Discuss different output devices used in computer system.

(4) What is register? Discuss different types of registers used in computer system.

(5) What is Operating System? Discuss different types of operating system.

(6) What is the function of a Communication Bus? Briefly describe the types of Bus used in a computer system.

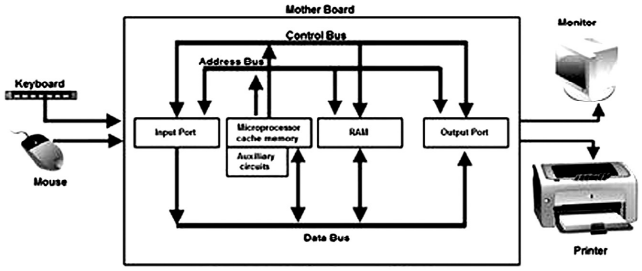
(7) What is Software? Describe basic types of software and their functions.

(8) What is common open standard? What are the principle and features of open standard?

UNIT - I

GROUP - C : ANSWER

(1) Computers internal architectural design comes in different types and sizes, but the basic structure remains same of all computer systems. The term 'computer hardware' or 'computer parts' is used to describe computer components that can be seen and touched. The major components of general-purpose computer system are Input Unit, main/internal Memory or Storage Unit, Output Unit, Central Processing unit. The CPU is further includes Arithmetic logic unit (ALU) and control unit (CU). All the units also referred to as "The functional units". Devices that are not integral part of CPU referred to as peripherals.



Components of a Computer System

The below section describe briefly all the computer components in a computer system

- **Input Unit**

  Input unit is used for transfers' raw Data and control signals into the information processing system by the user before processing and computation. All the input unit devices provide the instructions and data are transformed into binary codes that is the primary memory acceptable format.

  Example of Input unit devices: keyboard, mouse, scanner, joystick, MICR, Punched cards, Punched paper tape, Magnetic tape etc.

- **Memory or Storage Unit**

  Memory or Storage unit is used for storing Data during before and after processing. The capacity of storage is expressed in terms of Bytes.

  The two terms Memory or Storage unit are used interchangeably, so it is important to understand what is the difference between memory and storage?

- **Memory**

  This unit retains temporarily results till further processing, For example, Random Access Memory (RAM). This memory is volatile, which means data is disappears when the power is lost.

- **Storage**

  The storage or "secondary storage" is used for retain digital data after processing for permanently. For example hard drive. The Storage is non-volatile in nature. CPU does not access directly to secondary storage memories, instead they accessed via input-output unit. The contents of secondary storage memories are first transferred to the main memory (RAM) and then CPU access it.

- **Output Unit**

  Output Unit receives information from the CPU and then delivers it the external storage or device in the soft or hard processed form. The devices which are used to display output to the user are called output devices. The Monitor or printer is common output device.

- **Central Processing Unit**

The main chip in a computer is the microprocessor chip, which is also known as the CPU (central processing unit). The CPU is mounted on a printed circuit board called the main board or mother board. This chip is considered to be the controlling chip of a computer system since it controls the activities of other chips as well as outside devices connected to the computer, such as monitor and printer. In addition, it can also perform logical and computational tasks. Microprocessors work on a parallel system. Figure shows a typical structure of one of the first-generation microprocessors. The recent ones possess greater complexity, although the basic design concept has not changed much.

The various activities that a microprocessor performs, such as storing data, doing arithmetic calculations (addition, subtraction, multiplication, division, etc.), are the result of instructions given to the CPU in the form of sequences of 0s and 1s. Microprocessors are designed to carry out a large number of instructions and all the instructions may be represented by different sequences of 0s and 1s. Each instruction is represented by a unique set of 0s and 1s.

The internal structure of a typical CPU consists of circuits which form a number of registers (the typical number is 16), an arithmetic unit for carrying out arithmetic operations, a logic unit, and a control unit.

- **Arithmetic logic unit (ALU)**

Arithmetic Logical Unit is used for processing data after inputting data is stored into primary unit. The major operations of Arithmetic Logical Unit are addition, subtraction, multiplication, division, logic and comparison.

- **Control unit (CU)**

It is like a supervisor, that checks ordaining operations or check sequence in which instructions are executed.

(2) Different input devices which are used in a computer are : Keyboard, Mouse, Joy Stick, Light pen, Track Ball, Scanner, Graphic Tablet, Microphone, Magnetic Ink Card Reader (MICR), Optical Character Reader (OCR), Bar Code Reader, Optical Mark Reader (OMR).

- **Keyboard**

Keyboard is the most common and very popular input device which helps to input data to the computer. The layout of the keyboard is like that of traditional typewriter, although there are some additional keys provided for performing additional functions.

Keyboards are of two sizes 84 keys or 101/102 keys, but now keyboards with 104 keys or 108 keys are also available for Windows and Internet.

- **Mouse**

Mouse is the most popular pointing device. It is a very famous cursor-control device having a small palm size box with a round ball at its base, which senses the movement of the mouse and sends corresponding signals to the CPU when the mouse buttons are pressed.

Generally, it has two buttons called the left and the right button and a wheel is present between the buttons. A mouse can be used to control the position of the cursor on the screen, but it cannot be used to enter text into the computer.

Advantages

- Easy to use
- Not very expensive
- Moves the cursor faster than the arrow keys of the keyboard.

- **Joystick**

Joystick is also a pointing device, which is used to move the cursor position on a monitor screen. It is a stick having a spherical ball at its both lower and upper ends. The lower spherical ball moves in a socket. The joystick can be moved in all four directions.

The function of the joystick is similar to that of a mouse. It is mainly used in Computer Aided Designing (CAD) and playing computer games.

- **Light Pen**

Light pen is a pointing device similar to a pen. It is used to select a displayed menu item or draw pictures on the monitor screen. It consists of a photocell and an optical system placed in a small tube.

When the tip of a light pen is moved over the monitor screen and the pen button is pressed, its photocell sensing element detects the screen location and sends the corresponding signal to the CPU.

- **Track Ball**

Track ball is an input device that is mostly used in notebook or laptop computer, instead of a mouse. This is a ball which is half inserted and by moving fingers on the ball, the pointer can be moved.

Since the whole device is not moved, a track ball requires less space than a mouse. A track ball comes in various shapes like a ball, a button, or a square.

- **Scanner**

Scanner is an input device, which works more like a photocopy machine. It is used when some information is available on paper and it is to be transferred to the hard disk of the computer for further manipulation.

Scanner captures images from the source which are then converted into a digital form that can be stored on the disk. These images can be edited before they are printed.

- **Digitizer**

Digitizer is an input device which converts analog information into digital form. Digitizer can convert a signal from the television or camera into a series of numbers that could be stored in a computer. They can be used by the computer to create a picture of whatever the camera had been pointed at.

Digitizer is also known as Tablet or Graphics Tablet as it converts graphics and pictorial data into binary inputs. A graphic tablet as digitizer is used for fine works of drawing and image manipulation applications.

- **Microphone**

Microphone is an input device to input sound that is then stored in a digital form.

The microphone is used for various applications such as adding sound to a multimedia presentation or for mixing music.

- **Magnetic Ink Card Reader (MICR)**

MICR input device is generally used in banks as there are large number of cheques to be processed every day. The bank's code number and cheque number are printed on the cheques with a special type of ink that contains particles of magnetic material that are machine readable.

This reading process is called Magnetic Ink Character Recognition (MICR). The main advantages of MICR is that it is fast and less error prone.

- **Optical Character Reader (OCR)**

OCR is an input device used to read a printed text.

OCR scans the text optically, character by character, converts them into a machine readable code, and stores the text on the system memory.

- **Bar Code Readers**

Bar Code Reader is a device used for reading bar coded data (data in the form of light and dark lines). Bar coded data is generally used in labelling goods, numbering the books, etc. It may be a handheld scanner or may be embedded in a stationary scanner.

Bar Code Reader scans a bar code image, converts it into an alphanumeric value, which is then fed to the computer that the bar code reader is connected to.

- **Optical Mark Reader (OMR)**

OMR is a special type of optical scanner used to recognize the type of mark made by pen or pencil. It is used where one out of a few alternatives is to be selected and marked.

It is specially used for checking the answer sheets of examinations having multiple choice questions.

(3) Different output devices used in a computer System are :

- Monitors
- Graphic Plotter
- Printer

- **MONITORS**

Monitors, commonly called as Visual Display Unit (VDU), are the main output device of a computer. It forms images from tiny dots, called pixels that are arranged in a rectangular form. The sharpness of the image depends upon the number of pixels.

There are two kinds of viewing screen used for monitors.

- Cathode-Ray Tube (CRT)
- Flat-Panel Display

- **Cathode-Ray Tube (CRT) Monitor**

The CRT display is made up of small picture elements called pixels. The smaller the pixels, the better the image clarity or resolution. It takes more than one illuminated pixel to form a whole character, such as the letter 'e' in the word help.

A finite number of characters can be displayed on a screen at once. The screen can be divided into a series of character boxes - fixed location on the screen where a standard character can be placed. Most screens are capable of displaying 80 characters of data horizontally and 25 lines vertically.

There are some disadvantages of CRT ?

- Large in Size
- High power consumption

- **Flat-Panel Display Monitor**

The flat-panel display refers to a class of video devices that have reduced volume, weight and power requirement in comparison to the CRT. You can hang them on walls or wear them on your wrists. Current uses of flat-panel displays include calculators, video games, monitors, laptop computer, and graphics display.

The flat-panel display is divided into two categories ?

- **Emissive Displays -** Emissive displays are devices that convert electrical energy into light. For example, plasma panel and LED (Light-Emitting Diodes).
- **Non-Emissive Displays -** Non-emissive displays use optical effects to convert sunlight or light from some other source into graphics patterns. For example, LCD (Liquid-Crystal Device).

- **PRINTERS**

Printer is an output device, which is used to print information on paper.

There are two types of printers ?

- Impact Printers
- Non-Impact Printers

- **Impact Printers**

Impact printers print the characters by striking them on the ribbon, which is then pressed on the paper.

Characteristics of Impact Printers are the following -

- Very low consumable costs
- Very noisy
- Useful for bulk printing due to low cost
- There is physical contact with the paper to produce an image

These printers are of two types -

- Character printers
- Line printers

- **Character Printers**

Character printers are the printers which print one character at a time.

These are further divided into two types:

- Dot Matrix Printer (DMP)
- Daisy Wheel

- **Dot Matrix Printer**

In the market, one of the most popular printers is Dot Matrix Printer. These printers are popular because of their ease of printing and economical price. Each character printed is in the form of pattern of dots and head consists of a Matrix of Pins of size (5*7, 7*9, 9*7 or 9*9) which come out to form a character which is why it is called Dot Matrix Printer.

Advantages : Inexpensive, Widely Used and Other language characters can be printed.

Disadvantages : Slow Speed and Poor Quality.

- **Daisy Wheel**

Head is lying on a wheel and pins corresponding to characters are like petals of Daisy (flower) which is why it is called Daisy Wheel Printer. These printers are generally used for word-processing in offices that require a few letters to be sent here and there with very nice quality.

Advantages : More reliable than DMP, Better quality and Fonts of character can be easily changed.

Disadvantages : Slower than DMP, Noisy and More expensive than DMP.

- **Line Printers**

Line printers are the printers which print one line at a time.

These are of two types ?

- Drum Printer
- Chain Printer

- **Drum Printer**

This printer is like a drum in shape hence it is called drum printer. The surface of the drum is divided into a number of tracks. Total tracks are equal to the size of the paper, i.e. for a paper width of 132 characters, drum will have 132 tracks. A character set is embossed on the track. Different character sets available in the market are 48 character set, 64 and 96 characters set. One rotation of drum prints one line. Drum printers are fast in speed and can print 300 to 2000 lines per minute.

Advantages : Very high speed

Disadvantages : Very expensive and Characters fonts cannot be changed

- **Chain Printer**

In this printer, a chain of character sets is used, hence it is called Chain Printer. A standard character set may have 48, 64, or 96 characters.

Advantages : Character fonts can easily be changed and Different languages can be used with the same printer.

Disadvantages : Noisy

- **Non-impact Printers.**

Non-impact printers print the characters without using the ribbon. These printers print a complete page at a time, thus they are also called as Page Printers.

These printers are of two types ?

- Laser Printers
- Inkjet Printers

Characteristics of Non-impact Printers

- Faster than impact printers
- They are not noisy
- High quality
- Supports many fonts and different character size

- **Laser Printers**

These are non-impact page printers. They use laser lights to produce the dots needed to form the characters to be printed on a page.

Advantages : Very high speed, Very high quality output, Good graphics quality and Supports many fonts and different character size

Disadvantages : Expensive and Cannot be used to produce multiple copies of a document in a single printing

- **Inkjet Printers**

Inkjet printers are non-impact character printers based on a relatively new technology. They print characters by spraying small drops of ink onto paper. Inkjet printers produce high quality output with presentable features.

They make less noise because no hammering is done and these have many styles of printing modes available. Color printing is also possible. Some models of Inkjet printers can produce multiple copies of printing also.

Advantages : High quality printing and More reliable

Disadvantages : Expensive as the cost per page is high & Slow as compared to laser printer.

(4) A register is a very small amount of very fast memory that is built into the CPU (central processing unit) in order to speed up its operations by providing quick access to commonly used values. Registers refers to semiconductor devices whose contents can be accessed (i.e. read and written to) at extremely high speeds but which are held there only temporarily (i.e. while in use or only as long as the power supply remains on).

Registers are the top of the memory hierarchy and are the fastest way for the system to manipulate data. Registers are normally measured by the number of bits they can hold, for example, an 8-bit register means it can store 8 bits of data or a 32-bit register means it can store 32 bit of data.

Registers are used to store data temporarily during the execution of a program. Some of the registers are accessible to the user through instructions. Data and instructions must be put into the system. So we need registers for this.

The basic computer registers with their names, size and functions are listed below:

Register Symbol	Register Name	Number of Bits	Description
AC	Accumulator	16	Processor Register
DR	Data Register	16	Hold Memory Data
TR	Temporary Register	16	Holds Temporary Data
IR	Instruction Register	16	Holds Instruction Code
AR	Address Register	12	Holds Memory Address
PC	Program Counter	12	Holds Address of Next Instruction
INPR	Input Register	8	Holds Input Data
OUTR	Output Register	8	Holds Output Data

(5) An operating system is a program that acts as an interface between the user and the computer hardware and controls the execution of all kinds of programs.

Types of Operating Systems

Following are some of the most widely used types of Operating system.

(a) Single User Operating System

(b) Multi User Operating System

(c) Batch Operating System

(d) Network Operating System

(e) Distributed Operating System

- **Single user operating system**

A single user operating system provides the facilities to be used on one computer by only one user. In other words, it supports one user at a time. However, it may support more than one profiles. Single keyboard and single monitor are used for the purpose of interaction. Example: MS-DOS

- **Multi User Operating System**

A multi user operating system is a computer operating system which allows multiple users to access the single system with one operating system on it. It is generally used on large mainframe computers. Example : Linux, Unix, Windows 2000, Ubuntu, Mac OS etc.

- **Batch Operating System**

The operating system is termed as "batch operating" because the input data (job) are collected into batches or sets of records with similar needs and each batch is processed as a unit (group). The output is another batch that can be reused for computation. Examples of Batch based Operating System: Payroll System, Bank Statements etc.

- **Network Operating System**

A network operating system is an operating system designed for the sole purpose of supporting workstations, database sharing, application sharing and file and printer access sharing among multiple computers in a network. Some examples of other network operating systems include Microsoft Windows NT, Windows 2000, Microsoft Windows XP, Sun Solaris, and Linux.

- **Distributed Operating System**

A distributed operating system is software over a collection of independent, networked, communicating, and physically separate computational nodes. They handle jobs which are serviced by multiple CPUs. Each individual node holds a specific software subset of the global aggregate operating system. LOCUS and MICROS are the best examples of distributed operating systems.

(6) In computer architecture, a bus (a contraction of the Latin omnibus) is a communication system that transfers data between components inside a computer, or between computers.

Types of Computer Bus:

There are a variety of buses found inside the computer.

- **Data Bus :** The data bus allows data to travel back and forth between the microprocessor (CPU) and memory (RAM).

- **Address Bus :** The address bus carries information about the location of data in memory.

- **Control Bus :** The control bus carries the control signals that make sure everything is flowing smoothly from place to place

  A bus transfers electrical signals from one place to another. An actual bus appears as an endless amount of etched copper circuits on the motherboard's surface. The bus is connected to the CPU through the Bus Interface Unit.

  Data travels between the CPU and memory along the data bus. The location (address) of that data is carried along the address bus. A clock signal which keeps everything in synch travels along the control bus.

(7) Software is a set of instructions, data or programs used to operate computers and execute specific tasks.

Types of Computer Software

- **System Software**

  System software coordinates the complete system hardware and provides an environment or platform for all the other types of software to work in. It is the most basic type of software in any computer system, which is essential for other programs, applications and indeed for the whole computer system to function.Examples - Microsoft Windows XP, Mac OS, Linux, Windows Vista, Ubuntu, device drivers, etc.

- **Application Software**

  Application software are those that help the user perform the tasks of his/her choice. They are non-essential software which are installed and run depending upon the requirements, in the environment provided by the system software. Examples - MS Office, OpenOffice, Media Players, MS Access, educational software, media development software, Antivirus software, etc.

- **Programming Software**

  Programming software are used to write, test, debug and develop other software programs and applications. The various programming language editors such as Eclipse- a Java language editor, come under this category. They are used for creating both the system as well as application software. Examples - Turbo C, Xilinx, Kiel, compilers, debuggers, Integrated Development Environment (IDE), etc.)

- **Sub-types of Computer Software**

  Apart from the above major types of software, there are many other sub-types such as the ones mentioned below.

  Freeware - Freeware is a type of software that anyone can download from the Internet and use for free. Examples - Google Talk, Yahoo Messenger, uTorrent, etc.

  Shareware - Shareware is usually distributed for free on a trial basis. It can be shared without violation of any laws. They usually stop working or prompt the user to purchase the full version, once the trial period expires.Examples - BearShare, Kazaa, Winzip, etc.

(8) The open standard refers to internationally accepted technical standards. These standards are freely available and do not have any restriction.

Principles for selecting open standards for use in government :

(a) Open standards must meet user needs.

(b) Open standards must give suppliers equal access to government contracts.

(c) Open standards must support flexibility and change.

(d) Open standards must support sustainable cost.

(e) Select open standards using well-informed decisions.

(f) Select open standards using fair and transparent processes.

(g) Specify and implement open standards using fair and transparent processes.

Features of Open Standard:

(a) Available free of cost

(b) Ensure data application and platform independent.

(c) No hidden information.

(d) Diversity and interoperability in the industry.

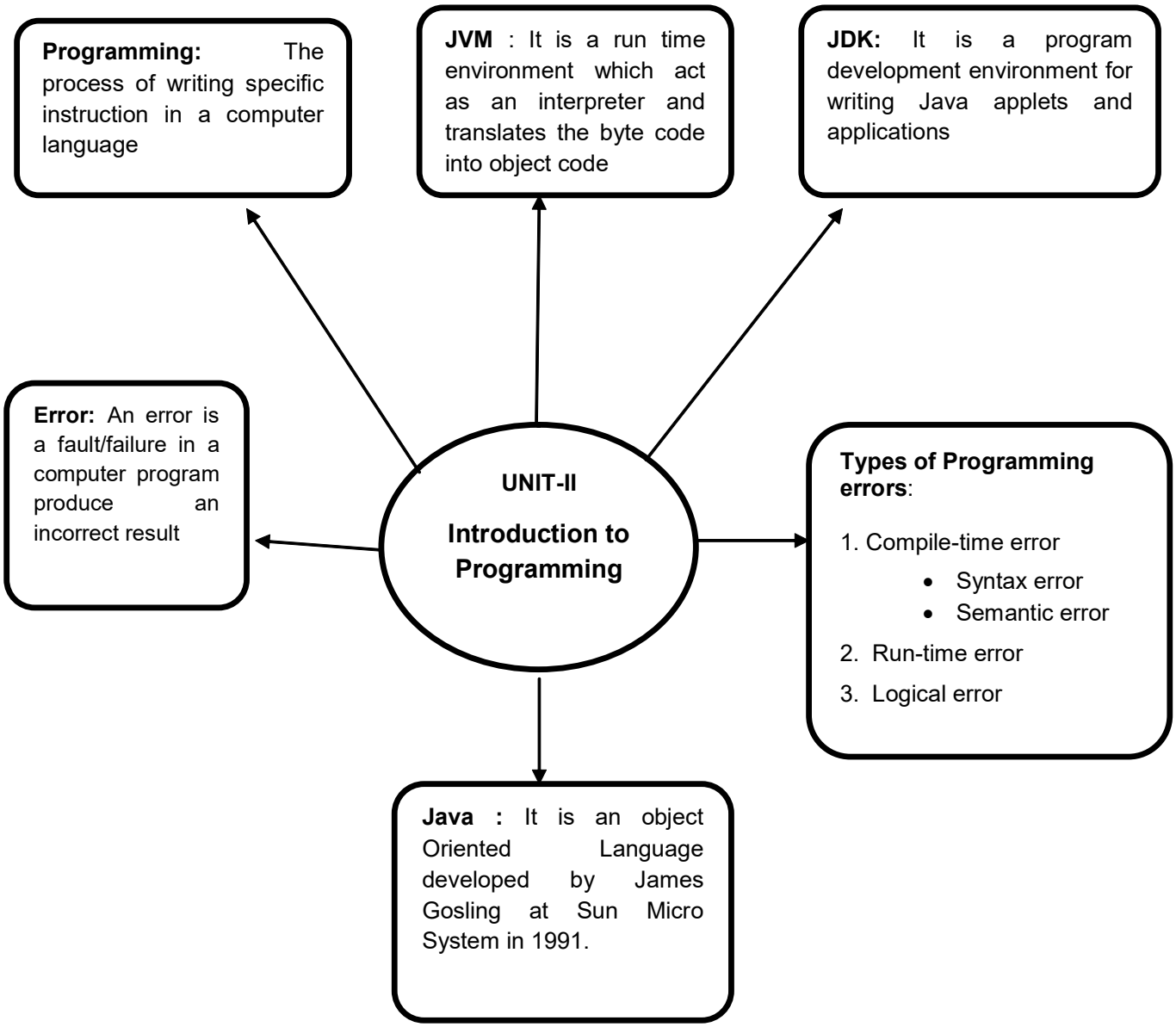
(e) Offer diverse choice for users.

(f) Make the data accessible to all.

UNIT - II

CHAPTER AT A GLANCE

INTRODUCTION TO PROGRAMMING



UNIT - II

GROUP - A : OBJECTIVE TYPE QUESTIONS

1. Multiple Choice Questions

1. The set of instructions in a programming language is called _____ .
   (a) Data (b) Information
   (c) Process (d) Program

2. Java is originally known as _____ .
   (a) C (b) D
   (c) OAK (d) NetBeans

3. Java programming language was designed by _____.
   (a) Sun Microsystem (b) TCS
   (c) Microsoft (d) Wipro

4. Who initiated the Java language?
   (a) James Gosling (b) Larry Page
   (c) Bjarne (d) DCP

5. Java source code is compiled into _____.
   (a) .Obj (b) .exe
   (c) Source Code (d) Bytecode

6. Which of the tool is used to compile java code?
   (a) Jar (b) Javac
   (c) Java (d) Javadoc

7. _____ is a program development environment for writing Java applets and applications.
   (a) JDK (b) RAD
   (c) JRE (d) IDE

8. Java compiler is named as _____.
   (a) Java (b) Javac
   (c) JRE (d) Jar

9. _____ is a java IDE that is open source and free.
   (a) Netbeans (b) JDK
   (c) JRE (d) None of these

10. _____ provides a way to interact with the different components of JAVA through visual graphical elements.
    (a) IDE (b) JAR
    (c) NetBeans IDE (d) Interface

11. Which of the following statements about the java language is true?
    (a) Java supports only Procedural Oriented Programming approach
    (b) Java is purely Object Oriented Language
    (c) Java supports both Procedural Oriented and Object oriented programming approach
    (d) None of these

12. JVM is run time environments which act as a/an _____ .
    (a) Compiler (b) Interpreter
    (c) Assembler (d) Debugger

13. Is java is called as platform independent language?
    (a) Yes (b) No
    (c) Can't say

14. Which of the following is smallest integer data type?
    (a) Int (b) Short
    (c) Byte (d) Long

15. Which of the following is not primitive data type?
    (a) Int (b) Byte
    (c) Short (d) Enum

16. What is the size of int data type in java?
    (a) 1 byte (b) 2 byte
    (c) 4 byte (d) 8 byte

17. && is an _____ operator.
    (a) Logical AND (b) Relational AND
    (c) Both (a) and (b) (d) None of these

18. Which of these values can a Boolean variable contain?
    (a) True & False (b) 0 & 1
    (c) Any integer value (d) None of these

19. Which of these are selection statements in Java?
    (a) If (b) For
    (c) Continue (d) All of these

20. Which is the default value of Boolean variable?
    (a) True (b) False
    (c) Null (d) Not defined

21. A _____ is a collection of classes, interface and sub-packages.
    (a) Package (b) JVM
    (c) Method (d) None of these

22. A _____ is a special data type also known as no return type.
    (a) void (b) int
    (c) float (d) None of these

23. A/An ____ is a flow, fault or failure in a computer program that causes it to produce an incorrect or unexpected.
    (a) Bug (b) Error
    (c) Debug (d) None of these

24. Which of the following component is best suited to selecting states?
    (a) List (b) Radio button
    (c) Check box (d) Combo box

2. *Expand the Followings:*

1. JVM
2. GPL
3. OOP
4. RAD
5. JDK
6. AWT

UNIT - II

GROUP - A : ANSWERS

1. Multiple Choice Questions

1. (d) Program
2. (c) OAK
3. (a) Sun Microsystem
4. (a) James Gosling
5. (d) Bytecode
6. (b) Javac
7. (a) JDK
8. (b) Javac
9. (a) Netbeans
10. (c) NetBeans IDE
11. (b Java is purely Object Oriented Language
12. (b) Interpreter
13. (a) Yes
14. (c) Byte
15. (d) Enum
16. (c) 4 byte
17. (a) Logical AND
18. (a) True & False
19. (a) If
20. (b) False
21. (a) Package
22. (a) void
23. (b) Error
24. (d) Combo box

2. Expand the Followings:

1. JVM : Java Virtual Machine
2. GPL : General Public Licence
3. OOP : Object Oriented Programming
4. RAD : Rapid Application Development
5. JDK : Java Development Kit
6. AWT : Abstract Window Toolkit

UNIT - II

GROUP - B : SHORT TYPE QUESTIONS

3. Short Questions to be answered within 30 words

(1) What is JVM ?

(2) Define Byte Code.

(3) What is JDK ?

(4) What is NetBeans ?

(5) What is AWT ?

(6) Define GUI.

(7) What is Java Swing?

(8) What is meant by case sensitive? Is Java is case sensitive?

(9) What is even driven programming?

(10) Name the loop that is never ends.

(11) Which window contains the Swing Control components?

(12) What is variable?

(13) What is meant by token?

(14) What is identifier?

(15) What is loop?

(16) What is unit testing?

(17) What is white box testing?

(18) What is validation?

(19) Name the three types of debugging error.

4. Short Questions to be answered within 50 words

(1) Briefly state the evolution of java.

(2) How Java compile its program ?

(3) What are various components of Swing ?

(4) Class can be used to define user-defined data type. HOW ?

(5) What is a dialog box? Define its type ?

(6) Write the difference between AWT and Swing.

(7) Difference between = and == operator.

(8) Difference between & and && operator.

(9) Difference between if and switch statement.

(10) Difference between while and do-while loop.

(11) What are the control statements available in java?

(12) What is the difference between combo box and list box ?

(13) What is the significance of break statement in switch-case construct ?

(14) Difference between compile time and run time error.

(15) Difference between black box and white box testing.

(16) Difference between Verification and Validation.

(17) Define and explain problem solving methodology.

UNIT - II

GROUP - B : ANSWERS

3. Short Questions to be answered within 30 words

(1) Java Virtual Machine **(JVM)** is a engine that provides runtime environment to drive the Java Code or applications. It converts Java byte code into machines language. **JVM** is a part of Java Run Environment (JRE).

(2) Byte code is program code that has been compiled from source **code** into low-level **code** designed for a software interpreter. It may be executed by a virtual machine (such as a JVM) or further compiled into machine code, which is recognized by the processor.

(3) The Java Development Kit **(JDK)** is a software development environment used for developing Java applications and applets. It includes the Java Runtime Environment (JRE), an interpreter/ loader (Java), a compiler (javac), an archiver (jar), a documentation generator (Javadoc) and other tools needed in Java development.

(4) NetBeans is an integrated development environment for Java. NetBeans allows applications to be developed from a set of modular software components called modules. NetBeans runs on Windows, macOS, Linux and Solaris.

(5) AWT stands for Abstract Window Toolkit. It is a platform dependent API for creating Graphical User Interface (GUI) for java programs. Why AWT is platform dependent? Java AWT calls native platform (Operating systems) subroutine for creating components such as textbox, checkbox, button etc.

(6) **Graphical user interface (GUI)** Software that works at the point of contact **(interface)** between a computer and its **user**, and which employs graphic elements (dialog boxes, icons, menus, scroll bars) instead of text characters to let the **user** give commands to the computer or to manipulate what is on the screen.

(7) Swing is a set of program component s for Java programmers that provide the ability to create graphical user interface (GUI) components, such as buttons and scroll bars, that are independent of the windowing system for specific operating system.

(8) Anything that is case sensitive discriminates between uppercase and lowercase letters. In other words, it means that two words that appear or sound identical but are using different letter cases, are not considered equal. Yes, Java is a case-sensitive language.

(9) In computer programming, event-driven programming is a programming paradigm in which the flow of the program is determined by events such as user actions, sensor outputs, or messages from other programs or threads.

(10) The endless loop is a loop which never ends and the statements inside are repeated forever.

(11) The palette window contains the Swing Control components.

(12) A variable is the name of memory location which holds the value.

(13) Tokens are the various Java program elements which are identified by the compiler. A token is the smallest element of a program that is meaningful to the compiler. Tokens supported in Java include keywords, variables, constants, special characters, operations etc.

(14) Identifiers in Java. Identifiers are the names of variables, methods, classes, packages and interfaces. Unlike literals they are not the things themselves, just ways of referring to them. In the HelloWorld program, HelloWorld, String, args, main and println are identifiers.

(15) In computer science, a loop is a programming structure that repeats a sequence of instructions until a specific condition is met. Programmers use loops to cycle through values, add sums of numbers, repeat functions, and many other things. Two of the most common types of loops are the while loop and for loop.

(16) Unit testing is a level of software testing where individual units/ components of a software are tested. A unit is the smallest testable part of any software. It usually has one or a few inputs and usually a single output. In procedural programming, a unit may be an individual program, function, procedure, etc.

(17) White box testing is also known as Clear Box testing, Open Box testing, Structural testing, Transparent Box testing, Code-Based testing, and Glass Box testing. ... On the other hand, White box testing is based on the inner workings of an application and revolves around internal testing.

(18) Validation is the process of establishing documentary evidence demonstrating that a procedure, process, or activity carried out in testing and then production maintains the desired level of compliance at all stages.

(19) The three types of debugging error are:

(a) Compile-time error

(i) Syntax error, Ex-Missing semicolon, parenthesis etc.

(ii) Semantic error, Ex- use of undeclared variable

(b) Run-time error, Ex- number division by zero.

(c) Logical error, Ex-Wrong formula used.

4. Short Questions to be answered within 50 words

(1) Java is a general-purpose programming language that is class-based, object-oriented, and designed to have as few implementation dependencies as possible. It is intended to let application developers write once, run anywhere, meaning that compiled Java code can run on all platforms that support Java without the need for recompilation. Java applications are typically compiled to byte code that can run on any Java virtual machine regardless of the underlying computer architecture. The syntax of Java is similar to C and C++, but it has fewer low-level facilities than either of them.

(2) Once you are in the correct directory, you can compile the program by typing javac filename.java into the command line and pressing enter. If you have any errors in your program, or if there is difficultly compiling, the command prompt will notify you.

(3) Swing components are basic building blocks of an application. Swing has a wide range of various components, including buttons, check boxes, sliders, and list boxes etc.

(4) The building block of Java that leads to Object-Oriented programming is a Class. It is a user-defined data type, which holds its own data members and member functions, which can be accessed and used by creating an instance of that class.

(5) A dialog box is a common type of window in the GUI of an operating system. It displays information, and asks a user for input. For example, when you are using a program and you want to open a file, you interact with the "File Open" dialog box.

There are two basic types of dialogs: modal and modeless. Modal dialogs block input to other top-level windows. Modeless dialogs allow input to other windows.

(6) Difference between AWT and Swing

AWT	Swing
• Platfrom Dependent • Does not follow MVC • Lesser Components • Does not support pluggable look and feel • Heavy weight	• Platform Independent • Follows MVC • More powerful components • Supports pluggable look and feel • Light weight

(7) Difference between = and == operator.

= is an Assignment Operator it is used to assign the value of variable or expression, while == is an Equal to Operator and it is a relation operator used for comparison (to compare value of both left and right side operands).

(8) Difference between & and && operator.

& is a bitwise operator and compares each operand bitwise. Whereas && is a logical AND operator and operates on Boolean operands. If both the operands are true, then the condition becomes true otherwise it is false.

(9) Difference between if and switch statement.

if statement	switch statement
• if can be used to test multiple conditions. • multiway execution is not available • if statement is not good choice if number of conditions is more. Because switch uses index mapping on variable choice to the corresponding solutions • for multiple condition if statement is not developer friendly and including maintenance of code could be tough • in if statement you can evaluate complex expressions • if statement accepts all data types	• switch cannot be used to test multiple conditions • switch provides multiway execution • switch statement is preferable if number of test conditions are more • switch is generally more dense for multiple condition • switch evaluate expression using constant • swith statement accepts only primitive types as key and constants for cases

(10) Difference between while and do-while loop.

WHILE LOOP	DO-WHILE LOOP
• Condition is checked first then statement(s) is executed. • It might occur statement(s) is executed zero times. If condition is false. • No semicolon at the end of while. While (conditoin). • If there is a single statement, brackets are not required. • Variable in condition is initialized before the execution of loop. • While loop is entry controlled loop. • While (condition)	• Statement(s) is executed atleast once, therefore condition is checked. • At least once the statement(s) is executed. • Semicolon at the end of while. While (conditoin); • Brackets are always required. • Variable may be initialized before or within the loop. • Do-while loop is exit controlled loop. • Do {statement(s);}

(11) In Java, the control statements are divided into three categories which are selection statements, iteration statements, and jump statements. A program can execute from top to bottom but if we use a control statement. We can set order for executing a program based on values and logic.

(12) List boxes and Combo boxes are used when the user needs to select a value from a set of many values. The difference between a List box and a Combo box is that a List box is simply a list of items, while a Combo box is a combination of a List box and an Edit box.

(13) In switch case, the break statement is used to terminate the switch case. Basically it is used to execute the statements of a single case statement. If no break appears, the flow of control will fall through all the subsequent cases until a break is reached or the closing curly brace '}' is reached.

(14) Compile-time checking occurs during the compile time. Compile time errors are error occurred due to typing mistake, if we do not follow the proper syntax and semantics of any programming language then compile time errors are thrown by the compiler. Ex-Syntax errors, Type checking errors.

Run-time type checking happens during run time of programs. Runtime errors are the errors that are generated when the program is in running state. Ex-Division by zero, Running out of memory.

(15) Black Box Testing is a software testing method in which the internal structure/ design/ implementation of the item being tested is not known to the tester. White Box Testing is a software testing method in which the internal structure/ design/ implementation of the item being tested is known to the tester.

(16) The distinction between the two terms is largely to do with the role of specifications. Validation is the process of checking whether the specification captures the customer's needs. Verification is the process of checking that the software meets the specification.

(17) Problem solving methodology means to find the solution for the problem. The methodology to solve a problem is defined as the most efficient solution to the problem. Under problem-solving methodology, we will see a step by step solution for a problem. These steps closely resemble the software life cycle. The several steps of this cycle are as follows:

(a) Problem Definition/Specification

(b) Problem Analysis

(c) Problem Designing

(d) Coding

(e) Program Testing and Debugging

(f) Documentation

(g) Program maintenance

UNIT - II

GROUP - C : LONG TYPE QUESTIONS

(1) Explain the features/characteristics of JAVA as Object Oriented Language.

(2) Discuss different Layout Managers offered by Java. Explain Border Layout.

(3) Explain different basic tools of JDK.

(4) Explain the NetBeans IDE.

(5) Explain some components of Swing control and its uses.

(6) Explain the uses of the following methods with example:

(i) setText()

(ii) toString()

(iii) concat()

(7) Write a class 'leap' to accept any year and check for if it is a leap year or not.

(8) Write a program to compute and display the root of quadratic equation $ax^2 + bx + c = 0$.

(9) Write a program to find sum of natural numbers from 1 to 100.

(10) Write the steps involved in program development.

(11) Explain the programming errors and their types in details.

(12) Explain the followings:

(i) Exception Handling

(ii) Syntax error

UNIT - II

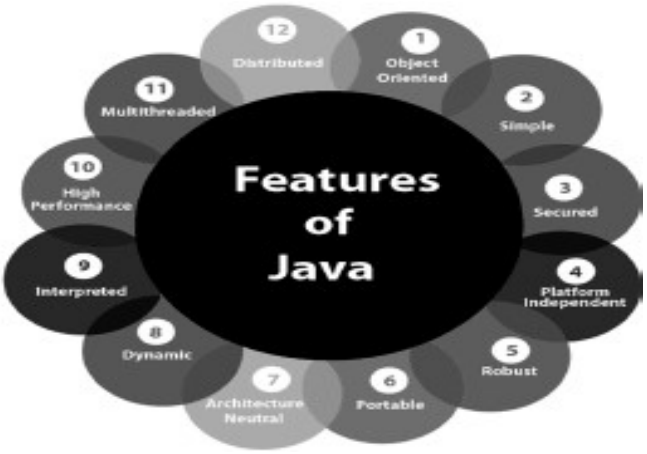
GROUP - C : ANSWER

(1) Features/characteristics of JAVA as Object Oriented Language.

- **Features of Java :**

The primary objective of Java programming language creation was to make it portable, simple and secure programming language. Apart from this, there are also some excellent features which play an important role in the popularity of this language. A list of most important features of Java language is given below.

(a) Simple, (b) Object-Oriented, (c) Portable, (d) Platform independent, (e) Secured, (f) Robust, (g) Architecture neutral, (h) Interpreted, (i) High Performance, (j) Multithreaded, (k) Distributed, (l) Dynamic.



- **Simple**

Java is very easy to learn, and its syntax is simple, clean and easy to understand. According to Sun, Java language is a simple programming language.

- **Object-oriented**

Java is an object-oriented programming language. Everything in Java is an object. Object-oriented means we organize our software as a combination of different types of objects that incorporates both data and behavior.

- **Platform Independent**

Java is platform independent because it is different from other languages like C, C++, etc. which are compiled into platform specific machines while Java is a write once, run anywhere language. A platform is the hardware or software environment in which a program runs.

- **Secured**

Java is best known for its security. With Java, we can develop virus-free systems.

- **Robust**

Robust simply means strong. Java is robust because:

- It uses strong memory management.
- There is a lack of pointers that avoids security problems.
- There is automatic garbage collection in java which runs on the Java Virtual Machine to get rid of objects which are not being used by a Java application anymore.
- There are exception handling and the type checking mechanism in Java. All these points make Java robust.

- **Architecture-neutral**

  Java is architecture neutral because there are no implementation dependent features, for example, the size of primitive types is fixed.

- **Portable**

  Java is portable because it facilitates you to carry the Java bytecode to any platform. It doesn't require any implementation.

- **High-performance**

  Java is faster than other traditional interpreted programming languages because Java bytecode is "close" to native code. It is still a little bit slower than a compiled language (e.g., C++). Java is an interpreted language that is why it is slower than compiled languages, e.g., C, C++, etc.

- **Distributed**

  Java is distributed because it facilitates users to create distributed applications in Java. RMI and EJB are used for creating distributed applications. This feature of Java makes us able to access files by calling the methods from any machine on the internet.

- **Multi-threaded**

  A thread is like a separate program, executing concurrently. We can write Java programs that deal with many tasks at once by defining multiple threads. The main advantage of multi-threading is that it doesn't occupy memory for each thread. It shares a common memory area. Threads are important for multi-media, Web applications, etc.

- **Dynamic**

  Java is a dynamic language. It supports dynamic loading of classes. It means classes are loaded on demand. It also supports functions from its native languages, i.e., C and C++.

  Java supports dynamic compilation and automatic memory management (garbage collection).

(2) Different Layout Managers offered by Java.

- **Java Layout Managers:**

  The Layout Managers are used to arrange components in a particular manner. Layout Manager is an interface that is implemented by all the classes of layout managers. There are following classes that represent the layout managers:

  (a) java.awt.BorderLayout

  (b) java.awt.FlowLayout

  (c) java.awt.GridLayout

  (d) java.awt.CardLayout

  (e) java.awt.GridBagLayout

  (f) javax.swing.BoxLayout

  (g) javax.swing.GroupLayout

  (h) javax.swing.ScrollPaneLayout

  (i) javax.swing.SpringLayout etc.

- **Java Border Layout:**

  The Border Layout is used to arrange the components in five regions: north, south, east, west and center. Each region (area) may contain one component only. It is the default layout of frame or window. The Border Layout provides five constants for each region:

  (a) public static final int NORTH

  (b) public static final int SOUTH

  (c) public static final int EAST

  (d) public static final int WEST

  (e) public static final int CENTER

(3) Different basic tools of JDK.

- **Basic Tools**

These tools are the foundation of the JDK. They are the tools you use to create and build applications.

Tool Name	Brief Description
appletviewer	Run and debug applets without a web browser.
apt	Annotation processing tool.
extcheck	Utility to detect Jar conflicts.
jar	Create and manage Java Archive (JAR) files.
java	The launcher for Java applications. In this release, a single launcher is used both for development and deployment.
javac	The compiler for the Java programming language.
javadoc	API documentation generator.
javah	C header and stub generator. Used to write native methods.
javap	Class file disassembler
jdb	The Java Debugger.

(4) The NetBeans IDE is free, Open-Source Integrated Development Environment for software developers. The IDE runs on many platforms including Windows, Linux, Solaris, and the MacOS. It is easy to install and use straight out of the box. The NetBeans IDE provides developers with all the tools they need to create professional cross-platform desktop, enterprise, web and mobile applications.

NetBeans IDE is a free, open source, popular (with approximately 1 million downloads), integrated development environment used by many developers. Out of the box, it provides built-in support for developing in Java, C, C++, XML, and HTML. And this author especially likes the support for editing JSPs, including syntax highlighting, HTML tag completion, JSP tag completion, and Java code completion. NetBeans IDE is available for free downloaded at http://www.netbeans.org Following are step-by-step instructions to help NetBeans IDE greenhorns to get started developing Java applications with NetBeans IDE.

The basic steps described are as follows.

(a) Create a new project

(b) Mount a directory - specify a location to save project files

(c) Add a new class to the project

(d) Compile and run a Java program

(5) Some components of Swing control are:

(a) Editor Panes and J Password Fields - for displaying web pages and inputting confidential information

(b) Dialogs - for displaying warnings, errors, prompting for input

(c) Check Boxes - for selecting a small set of options

(d) Radio Buttons - for mutually exclusive selection of options

(e) Combo Boxes - for selecting a small set of qualified options

(f) J Lists - for selecting from a large set of qualified options

(g) J Tables - for table displays

(h) J Menu Bar, J Menu, and J Menu Items - for creating menus

(i) File Chooser - for navigating through files and directories, and selecting files and directories

(j) Tabbed Panels - for allowing different panels to occupy the same screen area

(6) Uses of the following methods with example:

(i) setText() (ii) toString() (iii) concat()

- **setText() method :**

  The setText() method of java.text.String Character Iterator class in Java is used to set the current text that is to be read by this String Character Iterator. This method takes the text to be set as a parameter and sets the text of this String Character Iterator at that text.

  Syntax: public void setText(String text)

- **toString() method:**

  If you want to represent any object as a string, toString() method comes into existence.

  The toString() method returns the string representation of the object.

  If you print any object, java compiler internally invokes the toString() method on the object. So overriding the toString() method, returns the desired output, it can be the state of an object etc. depends on your implementation.

  Syntax : String toString()
  static String toString(int i)

  - toString() - This returns a String object representing the value of this Integer.
  - toString(int i) - This returns a String object representing the specified integer.

- **concat() method:**

  The concat() method is used to concatenate a given string to the end of another string.

  If the length of the argument string is 0, then this String object is returned.

  Otherwise, a String object is returned that represents a character sequence that is the concatenation of the character sequence represented by this String object and the character sequence represented by the argument string.

  Syntax: concat(string str)

(7)

```
import java.util.Scanner;

public class leap
{
 public static void main(String args[])
{
int yr;
Scanner scan = new Scanner(System.in);
System.out.print("Enter Year : ");
yr = scan.nextInt();
if((yr%4 == 0) && (yr%100!=0))
{
System.out.print("This is a Leap Year");
}
else if((yr%100 == 0) && (yr%400 == 0))
{
System.out.print("This is a Leap Year");
}
else if(yr%400 == 0)
{
System.out.print("This is a Leap Year");
}
else
{
System.out.print("This is not a Leap Year");
}
}
}
```

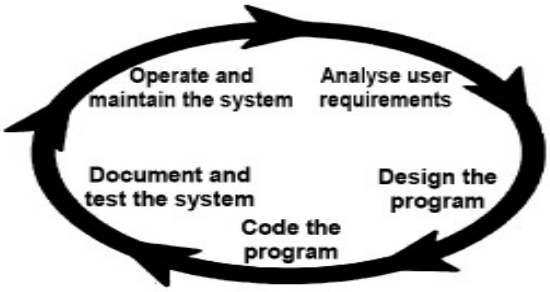
(8)
```
import java.util.Scanner;

public class quadratic
{
public static void main(String[] Strings)
{
Scanner input = new Scanner(System.in);
System.out.print("Input a: ");
double a = input.nextDouble();
System.out.print("Input b: ");
double b = input.nextDouble();
System.out.print("Input c: ");
double c = input.nextDouble();
double result = b * b - 4.0 * a * c;
if (result > 0.0) {
double r1=(-b + Math.pow(result, 0.5))/(2.0*a);
double r2=(-b - Math.pow(result, 0.5))/(2.0*a);
System.out.println ("The roots are"+r1+"and"+r2);
} else if (result == 0.0) {
double r1 = -b / (2.0 * a);
System.out.println("The root is " + r1);
} else {
System.out.println ("The equation has no real
roots.");
}
}
}
```

(9)
```
Class number
{
Public static void main(String Args[])
{
int sum=0;
for (int i=1; i<=100 ; i++)
{
sum=sum+i;
}
System.out.println("Sum= " +sum);
}
}
```

(10) A program development process consists of various steps that are followed to develop a computer program. These steps are followed in a sequence in order to develop a successful and beneficial computer program. Following is the brief description about program development process.

- **Program Development Process**



A programmer has to go through the following stages to develop a computer program:

(a) Defining and Analyzing The Problem
(b) Designing The Algorithm
(c) Coding or Writing The Program
(d) Test Execution
(e) Debugging
(f) Final Documentation

Step by step details of the program development process follows:

- **Defining and Analyzing the Problem**

In this step, a programmer studies the problem. He decides the best way to solve these problems. Studying a problem is also necessary because it helps a programmer to decide about the following things:

- The facts and figures which are necessary for developing the program.
- The way in which the program will be designed
- Also, the language in which the program will be most suitable.
- What is the desired output and in which form it is needed, etc

- **Designing the Algorithm**

  An algorithm is a sequence of steps that must be carried out before a programmer starts preparing his program. The programmer designs an algorithm to help visual possible alternatives in a program also.

- **Coding or Writing the Program**

  The next step after designing the algorithm is to write the program in a high-level language. This process is known as coding.

- **Test Execution**

  The process of executing the program to find out errors or bugs is called test execution. It helps a programmer to check the logic of the program. It also ensures that the program is error-free and workable.

- **Debugging**

  Debugging is a process of detecting, locating and correcting the bugs in a program. It is performed by running the program again and again.

- **Final Documentation**

  When the program is finalized, its documentation is prepared. Final documentation is provided to the user. It guides the user how to use the program in the most efficient way.

(11) A software bug is an error, flaw or fault in a computer program or system that causes it to produce an incorrect or unexpected result.

Types of programming error : There are three types of errors

(a) **Compile time error :** All the errors that are detected and displayed by the java compiler are known as compile time error. There are two types of compile time error.

(i) *Syntax error :* When a formal set of rules defined for writing a program in a particular language is not followed then the error raised is known as syntax error. Example: missing semicolon, parenthesis etc.

(ii) *Semantic error :* This type of error indicates an improper use of programming statement. Example: use of an undeclared variables.

(b) **Run-time error :** Run time errors are occurring during the execution of a program. Example: number division by zero.

(c) **Logical error :** In case the program can't give any error but still giving an incorrect output, it is due to logical error. Example: wrong formula is used to calculate any mathematical expression.

(12) (i) **Exception Handling**

Exception handling is the process of responding to exceptions when a computer program runs. An exception occurs when an unexpected event happens that requires special processing.

An exception is an event which causes the program to be unable to flow in its intended execution. There are three types of exception-the checked exception, the error and the runtime exception.

There are two types of exceptions in java. One is checked exception where try catch block is mandatory and second is unchecked exception where try catch block is optional. Checked exception occurs at compile time while unchecked we know at run time.

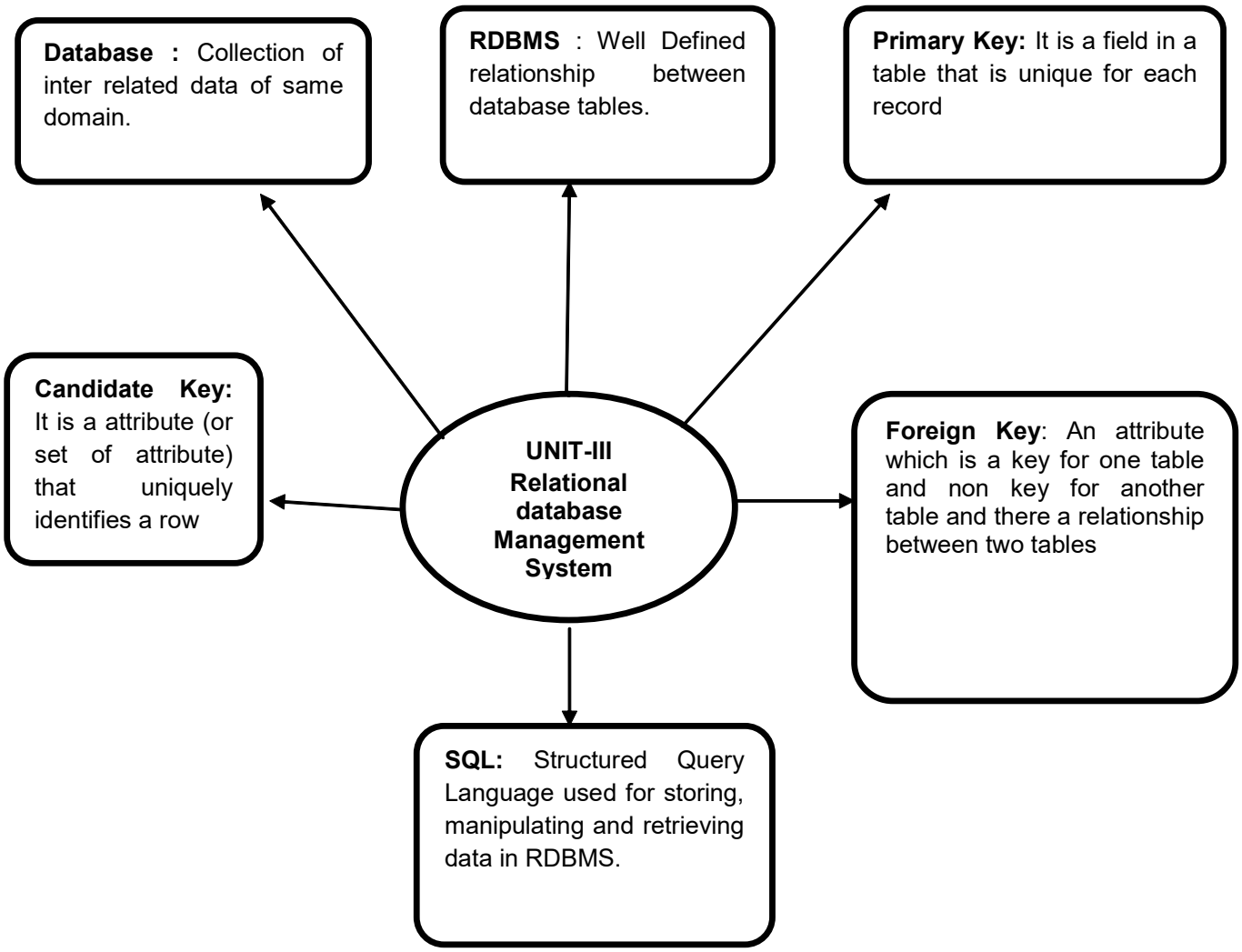
(ii) **Syntax error**

This is a compile time error. When a formal set of rules defined for writing a program in a particular language is not followed then the error raised is known as syntax error. Example: missing semicolon, parenthesis etc.

UNIT - III

CHAPTER AT A GLANCE

RELATIONAL DATABASE MANAGEMENT SYSTEM



UNIT - III

GROUP - A : OBJECTIVE TYPE QUESTIONS

1. Multiple Choice Questions

1. A relation can have only one _____ key and may have more than one _____ key.
   (a) Primary, Candidate
   (b) Candidate, Alternate
   (c) Candidate, Primary
   (d) Alternate, Candidate

2. A tuple is also known as a _____ .
   (a) Table (b) Relation
   (c) Row (d) Field

3. An attribute is also known as a _____.
   (a) Table (b) Relation
   (c) Row (d) Column

4. An attribute (or set of attribute) that uniquely identifies a row is called:
   (a) Candidate key (b) Foreign key
   (c) Main key (d) Alternate key

5. Which of the following is a commercial DBMS package?
   (a) Oracle DB (b) MYSQL
   (c) Ingres (d) Enterprise DB

6. Which of the following is a/an Open Source database suites?
   (a) Oracle DB (b) IBM DB2
   (c) Sybase (d) MYSQL

7. Which operating is supported by mobile database package SQLite.
   (a) Android (b) Blackberry
   (c) Window phone (d) All of these

8. SQL stands for:
   (a) Structured Query Language
   (b) Statistical Query Language
   (c) Standard Query Language
   (d) Structured Query Library

9. SQL was initially developed by:
   (a) IBM Inc. (b) Microsoft Inc.
   (c) Oracle (d) Hewlett Packard

10. Which of the following is a DDL command?
    (a) CREATE (b) SELECT
    (c) COMMIT (d) GRANT

11. Which of the following is a DML command?
    (a) ALTER (b) INSERT
    (c) REVOKE (d) COMMIT

12. Which of the following is a DCL command
    (a) DROP (b) DELETE
    (c) UPDATE (d) GRANT

13. Which of the following is a TCL command
    (a) DROP (b) DELETE
    (c) COMMIT (d) GRANT

14. DELETE command
    (a) Remove a table
    (b) Remove a database
    (c) Remove records
    (d) All of these

15. Which command is used to give user's access privileges to database?
    (a) GRANT (b) REVOKE
    (c) COMMIT (d) CREATE

16. Which command is used to withdraw user's access privileges to database?
    (a) GRANT (b) REVOKE
    (c) COMMIT (d) CREATE

17. Which command is used to save the work done in database?
    (a) GRANT (b) REVOKE
    (c) COMMIT (d) ALTER

18. Database can be removed using _____ command.
    (a) DROP (b) DELETE
    (c) ALTER (d) SELECT

19. Which statement is used to insert new data in a table?
    (a) ADD record (b) INSERT record
    (c) INSERT INTO (d) INSERT row

20. Which clause used to sort the records in a table?
    (a) ORDER BY (b) SORTED ORDER
    (c) SORT (d) SORT By

2. *Expand the Followings:*

1. SQL
2. POS
3. DDL
4. DML
5. TCL
6. DCL

UNIT - III

GROUP - A : ANSWERS

1. Multiple Choice Questions

1. (a) Primary, Candidate
2. (c) Row
3. (d) Column
4. (a) Candidate key
5. (a) Oracle DB
6. (d) MYSQL
7. (a) Android
8. (a) Structured Query Language
9. (a) IBM Inc.
10. (a) CREATE
11. (b) INSERT
12. (d) GRANT
13. (c) COMMIT
14. (c) Remove records
15. (d) GRANT
16. (b) REVOKE
17. (c) COMMIT
18. (a) DROP
19. (c) INSERT INTO
20. (a) ORDER BY

2. Expand the Followings:

1. SQL : Structured Query Language
2. POS : Point Of Sale
3. DDL : Data Definition language
4. DML : Data Manipulation Language
5. TCL : Transaction Control Language
6. DCL : Data Control Language

UNIT - III

GROUP - B : SHORT TYPE QUESTIONS

3. *Short Questions to be answered within 30 words*

(1) Define Database.

(2) Define RDBMS.

(3) Define table.

(4) Define primary key

(5) Define Candidate key

(6) Define Alternate key

(7) What is Composite key?

(8) What is MYSQL?

(9) What is DDL?

(10) What is DML?

(11) What is DCL?

(12) What is TCL?

4. *Short Questions to be answered within 50 words*

(1) What is the relation between a Database and Table?

(2) What is primary key? What is its purpose in a table?

(3) Distinguish between primary key and candidate key.

(4) What are differences between DELETE and DROP command in SQL?

(5) Discuss different categories of commands of SQL?

(6) Difference between DDL and DML?

(7) Compare between CHAR and VARCHAR data types.

UNIT - III

GROUP - B : ANSWERS

3. Short Questions to be answered within 30 words

(1) A database is an organized collection of data, generally stored and accessed electronically from a computer system.

(2) RDBMS stands for Relational Database Management Systems. All modern database management systems like SQL, MS SQL Server, IBM DB2, ORACLE, My-SQL and Microsoft Access are based on RDBMS. It is called Relational Data Base Management System (RDBMS) because it is based on relational model introduced by E.F. Codd.

(3) A table is a collection of related data held in a table format within a database. It consists of columns and rows.

(4) A primary key is a minimal set of attributes (columns) in a table that uniquely identifies tuples (rows) in that table.

(5) A candidate key is an attribute (or set of attributes) that uniquely identifies a row.

(6) A table can have multiple candidate keys. Among these candidate keys, only one key gets selected as primary key, the remaining keys are known as alternative or secondary keys.

(7) In database design, a composite key is a candidate key that consists of two or more attributes (table columns) that together uniquely identify an entity occurrence (table row)

(8) MySQL is an open source relational database management system (RDBMS) that uses Structured Query Language (SQL), the most popular language for adding, accessing, and processing data in a database.

(9) DDL is Data Definition Language which is used to define data structures. For example: create table, alter table are instructions in SQL.

(10) DML is Data Manipulation Language which is used to manipulate data itself. For example: insert, update, delete are instructions in SQL.

(11) DCL is short name of Data Control Language which includes commands such as GRANT and mostly concerned with rights, permissions and other controls of the database system.

Ex:-

- GRANT - allow users access privileges to the database.
- REVOKE-withdraw users access privileges given by using the GRANT command.

(12) TCL is short name of Transaction Control Language which deals with a transaction within a database.

Ex:-

- COMMIT - commits a Transaction
- ROLLBACK - rollback a transaction in case of any error occurs
- SAVEPOINT - to rollback the transaction making points within groups

4. Short Questions to be answered within 50 words

(1) A table is an object inside a database. A database has tables of data, views, indexes and programs. A database can have 10 or thousands of tables. More specifically, a table is a collection (rows) of data on a single related topic. For example, the Employees table. A database is a collection of objects, primarily tables, but also indexes to help search the tables, views that filter, select and combine the data in the tables, and stored procedures (pre-defined programs that perform specific actions on the database).

(2) A primary key is a special relational database table column (or combination of columns) designated to uniquely identify all table records. A primary key's main features are: It must contain a unique value for each row of data. It cannot contain null values.

(3) Both Primary Key and Candidate key are used to get records from tables. These keys are also used to create relationship between tables. Primary Key and Candidate key both are used to identify records uniquely in a table. A Primary Key is a column or a combination of columns that uniquely identify a record. Only one Candidate Key can be Primary Key. A Candidate Key can be any column or a combination of columns that can qualify as unique key in database. There can be multiple Candidate Keys in one table. Each Candidate Key can qualify as Primary Key.

(4) DELETE command is a Data Manipulation Language command where as, DROP is a Data Definition Language Command. The point that distinguishes DELETE and DROP command is that DELETE is used to remove tuples from a table and DROP is used to remove entire schema, table, domain or constraints from the database.

(5) SQL commands are mainly categorized into four categories as:

- DDL - Data Definition Language.
- DML - Data Manipulation Language.
- DCL - Data Control Language.
- TCL-Transaction Control Language

(6) The basic difference between DDL and DML is that DDL (Data Definition Language) is used to Specify the database schema database structure. On the other hand, DML (Data Manipulation Language) is used to access, modify or retrieve the data from the database.

(7) Char is a fixed-length data type, the storage size of the char value is equal to the maximum size for this column. Varchar is a variable-length data type, the storage size of the varchar value is the actual length of the data entered, not the maximum size for this column. Varchar is variable-length.

UNIT - III

GROUP - C : LONG TYPE QUESTIONS

(1) What is RDBMS? What are the advantages and disadvantages?

(2) What is Key? What are different keys are used in database.

(3) Discuss different categories of commands of SQL.

(4) What is data type? Explain Numeric data type of MYSQL.

UNIT - III

GROUP - C : ANSWER

(1) A relational database management system is a database management system that is based on the relational model as invented by E. F. Codd.

- **Advantages of RDBMS**
  - It is easy to use.
  - It is secured in nature.
  - The data manipulation can be done.
  - It limits redundancy and replication of the data.
  - It offers better data integrity.
  - It provides better physical data independence.
  - It offers logical database independence i.e. data can be viewed in different ways by the different users.
  - It provides better backup and recovery procedures.
  - It provides multiple interfaces.
  - Multiple users can access the database which is not possible in DBMS.
- **Disadvantages of RDBMS**
  - Software is expensive.
  - Complex software refers to expensive hardware and hence increases overall cost to avail the RDBMS service.
  - It requires skilled human resources to implement.
  - Certain applications are slow in processing.
  - It is difficult to recover the lost data.

(2) A key is an attribute or a combination of attributes that uniquely identifies each row within a table.

- **Primary Key**

  A primary key is a special relational database table column (or combination of columns) selected to uniquely identify all table records. A primary Key which uniquely identifies a row of table, primary key does not allow null values and also not allow duplicate values.

- **Candidate Key**

  When one key attribute is not sufficient to determine all other non key values of a relation, at that times more than one key attributes or more than one combination of key attributes uniquely determines row of a relation is called candidate key. Generally a candidate key becomes the primary key of the relation. If a relation has more than one candidate key, one of them will become the primary key and the rest are called alternate key.

- **Alternate key**

  A candidate key that is not the primary key is called an alternate key.

- **Foreign Key**

  A foreign key is a field in a relational table that matches the primary key column of another table. The foreign key can be used to cross-reference tables.

- **Composite Key**

  A composite key, in the context of relational databases, is a combination of two or more columns in a table that can be used to uniquely identify each row in the table. Uniqueness is only guaranteed when the columns are combined; when taken individually the columns do not guarantee uniqueness.

(3) These SQL commands are mainly categorized into four categories as:

(a) DDL - Data Definition Language

(b) DQL - Data Query Language

(c) DML - Data Manipulation Language

(d) DCL - Data Control Language

(a) **DDL (Data Definition Language) :**

DDL or Data Definition Language actually consists of the SQL commands that can be used to define the database schema. It simply deals with descriptions of the database schema and is used to create and modify the structure of database objects in the database.

Examples of DDL commands:

- **CREATE -** is used to create the database or its objects (like table, index, function, views, store procedure and triggers).
- **DROP -** is used to delete objects from the database.
- **ALTER -** is used to alter the structure of the database.
- **TRUNCATE -** is used to remove all records from a table, including all spaces allocated for the records are removed.
- **COMMENT -** is used to add comments to the data dictionary.
- **RENAME -** is used to rename an object existing in the database.

(b) **DQL (Data Query Language) :**

DML statements are used for performing queries on the data within schema objects. The purpose of DQL Command is to get some schema relation based on the query passed to it.

Example of DQL:

- **SELECT -** is used to retrieve data from the database.

(c) **DML (Data Manipulation Language) :**

The SQL commands that deals with the manipulation of data present in the database belong to DML or Data Manipulation Language and this includes most of the SQL statements.

Examples of DML:

- **INSERT -** is used to insert data into a table.
- **UPDATE -** is used to update existing data within a table.
- **DELETE -** is used to delete records from a database table.

(d) **DCL (Data Control Language) :**

DCL includes commands such as GRANT and REVOKE which mainly deals with the rights, permissions and other controls of the database system.

Examples of DCL commands:

- GRANT-gives user's access privileges to database.
- REVOKE-withdraw user's access privileges given by using the GRANT command.

(e) **TCL (transaction Control Language) :**

TCL commands deals with the transaction within the database.

Examples of TCL commands:

- COMMIT- commits a Transaction.
- ROLLBACK- rollbacks a transaction in case of any error occurs.
- SAVEPOINT-sets a savepoint within a transaction.

(4) Data type specifies a particular type of data, such as integer, floating-point, Boolean etc. A data type also specifies the possible values for that type, the operations that can be performed on that type and the way the values of that type are stored.

- **Numeric Data Types:**

MySQL uses all the standard ANSI SQL numeric data types, so if you're coming to MySQL from a different database system, these definitions will look familiar to you.

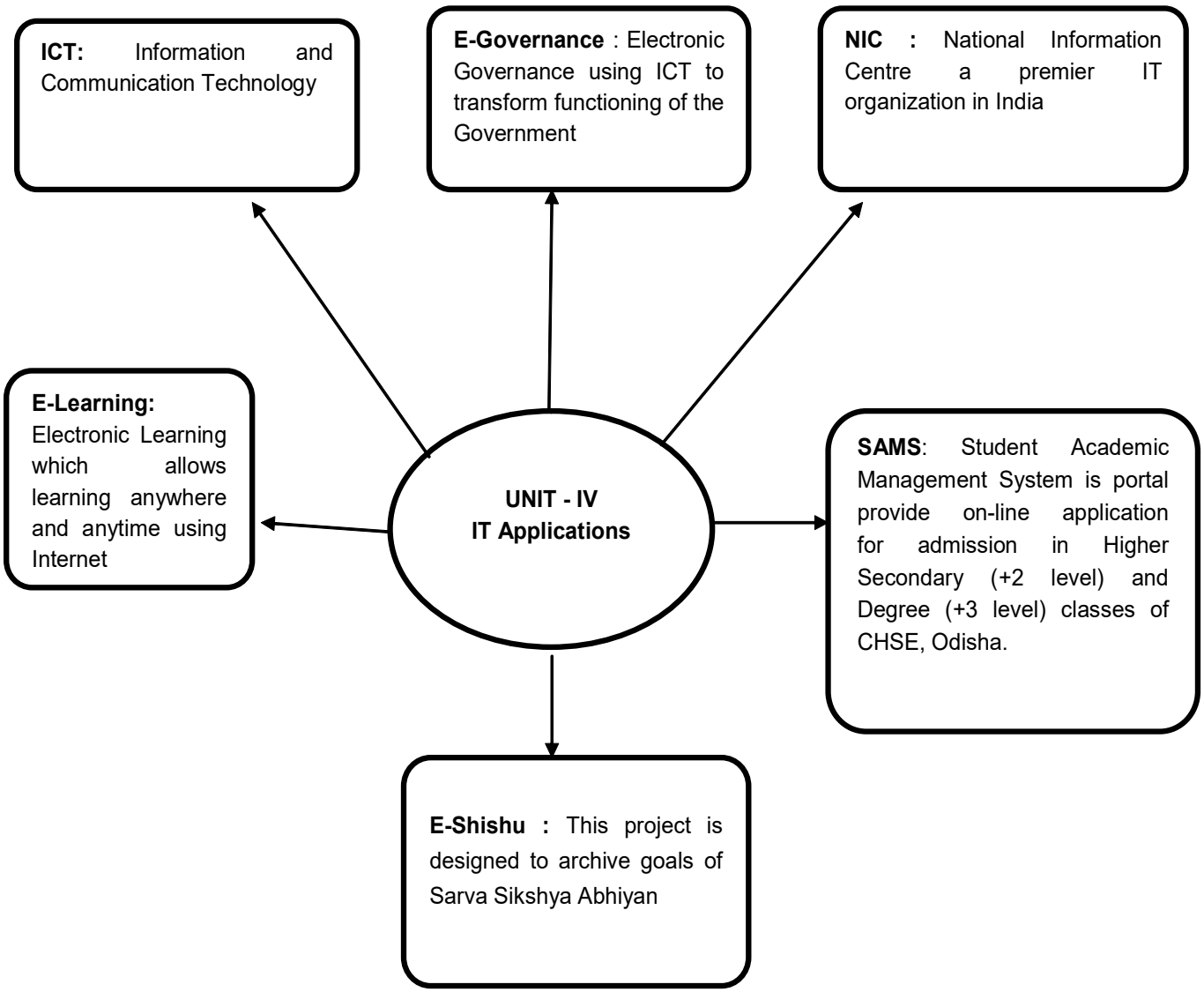
The following list shows the common numeric data types and their descriptions ?

- **INT -** A normal-sized integer that can be signed or unsigned. If signed, the allowable range is from -2147483648 to 2147483647. If unsigned, the allowable range is from 0 to 4294967295. You can specify a width of up to 11 digits.
- **TINYINT -** A very small integer that can be signed or unsigned. If signed, the allowable range is from -128 to 127. If unsigned, the allowable range is from 0 to 255. You can specify a width of up to 4 digits.
- **SMALLINT -** A small integer that can be signed or unsigned. If signed, the allowable range is from -32768 to 32767. If unsigned, the allowable range is from 0 to 65535. You can specify a width of up to 5 digits.
- **MEDIUMINT -** A medium-sized integer that can be signed or unsigned. If signed, the allowable range is from -8388608 to 8388607. If unsigned, the allowable range is from 0 to 16777215. You can specify a width of up to 9 digits.
- **BIGINT -** A large integer that can be signed or unsigned. If signed, the allowable range is from - 9223372036854775808 to 9223372036854775807. If unsigned, the allowable range is from 0 to 18446744073709551615. You can specify a width of up to 20 digits.
- **FLOAT(M,D) -** A floating-point number that cannot be unsigned. You can define the display length (M) and the number of decimals (D). This is not required and will default to 10,2, where 2 is the number of decimals and 10 is the total number of digits (including decimals). Decimal precision can go to 24 places for a FLOAT.
- **DOUBLE (M,D) -** A double precision floating-point number that cannot be unsigned. You can define the display length (M) and the number of decimals (D). This is not required and will default to 16,4, where 4 is the number of decimals. Decimal precision can go to 53 places for a DOUBLE. REAL is a synonym for DOUBLE.
- **DECIMAL (M,D) -** An unpacked floating-point number that cannot be unsigned. In the unpacked decimals, each decimal corresponds to one byte. Defining the display length (M) and the number of decimals (D) is required. NUMERIC is a synonym for DECIMAL.

UNIT - IV

CHAPTER AT A GLANCE

IT APPLICATIONS



UNIT - IV

GROUP - A : OBJECTIVE TYPE QUESTIONS

1. Multiple Choice Questions

1. UID card refers to _____ card.
   (a) Aadhaar
   (b) PAN
   (c) Voter
   (d) Driving

2. E-Procurement software is developed by _____.
   (a) OCAC
   (b) NIC
   (c) TCS
   (d) None of these

3. SAMS portal provides
   (a) Facilities of on-line application for admission to Higher Secondary (+2 level) as well as Degree (+3 level) classes in different colleges and Higher Secondary Schools under CHSE, Odisha.
   (b) Disaster Management
   (c) Land Records
   (d) None of these

4. OdishaOnline is a
   (a) Child Tracking Portal
   (b) Disaster Management Portal
   (c) Land Records Portal
   (d) On-line Payment Portal

5. SWAYAM stands for
   (a) Sequential Way of Amplitude Modulation
   (b) Study Webs of Active Learning for Young Aspirant Minds
   (c) State's Wireless Application Yojana for Assisted Mechanisms
   (d) Student Web-portal for Academic Year Acquired Marks

6. SARANSH is an online platform for analysis of student's performance and progress has been launched by:
   (a) Ministry of Human Resource and Development
   (b) Ministry of Information Technology
   (c) Ministry of Higher Education
   (d) None of these

2. Expand the Followings:

1. B2B
2. B2C
3. C2B
4. C2C
5. G2C
6. G2B
7. CSC
8. OCA
9. NIC
10. OSWAN
11. SAMS
12. BHQ
13. SHQ
14. GIS
15. SSA
16. DPEP
17. NPTEL
18. VLE
19. OCW
20. MIT
21. MDN
22. MHRD
23. SWAYAM
24. JIT
25. MOOC

UNIT - IV

GROUP - A : ANSWERS

1. Multiple Choice Questions

1. (a) Aadhaar
2. (b) NIC
3. (a) Facilities of on-line application for admission to Higher Secondary (+2 level) as well as Degree (+3 level) classes in different colleges and higher Secondary Schools under CHSE, Odisha.
4. (d) On-line Payment Portal
5. (b) Study Webs of Active Learning for Young Aspirant Minds
6. (a) Ministry of Human Resource and Development

2. Expand the Followings:

1. B2B : Business-to-Business
2. B2C : Business-to-Consumer
3. C2B : Consumer-to-Business
4. C2C : Consumer -to-Consumer
5. G2C : Government-to-Customer
6. G2B : Government-to-Business
7. CSC : Common Service Centres
8. OCA : Odisha Computer Application Centre
9. NIC : National Informatics Centre
10. OSWAN : Odisha State Wide Area Network
11. SAMS : Students Academic Management System
12. BHQ : Block Head Quarters
13. SHQ : State Head Quarters
14. GIS : Geographic Information System
15. SSA : Sarva Shiksha Abhiyan
16. DPEP : District Primary Education Programme
17. NPTEL : National Programme on Technology Enhanced Learning
18. VLE : Virtual Learning Environment
19. OCW : Open Course Ware
20. MIT : Massachusetts Institute of Technology
21. MDN : Mozilla Developer Network
22. MHRD : Ministry of Human Resource and Development
23. SWAYAM : Study Webs of Active Learning for Young Aspiring Minds'
24. JIT : Just in Time
25. MOOC : Massive Open Online Course

UNIT - IV

GROUP - B : SHORT TYPE QUESTIONS

3. Short Questions to be answered within 30 words

(1) What is E-Governance?

(2) What is ICT?

(3) What is E-Learning?

4. Short Questions to be answered within 50 words

(1) What are advantages of E-Governance ?

(2) What are disadvantages of E-Governance ?

(3) What is E-Learning ? What are advantages of E-Learning ?

UNIT - IV

GROUP - B : ANSWERS

3. Short Questions to be answered within 30 words

(1) E-Governance can be defined as the application of communication and information technology for providing government services, exchange of information, transactions, integration of previously existing services and information portals.

(2) ICT is short for "Information and Communication Technologies." It is similar to IT (Information Technology), but focuses more on telecommunications mediums, such as the Internet, cell phone networks, and satellite technology. Modern forms of ICT have made it possible for users across the world to communicate with each other in real-time on a regular basis.

(3) E-learning refers to the use of information and communication technologies to enable the access to online learning/teaching resources.

4. Short Questions to be answered within 50 words

(1) Advantages of E-Governance:

- E-Governance is improvement in governance which is enabled by the resourceful use of Information and Communications Technology.
- E-Governance brings better access to information and excellence services for inhabitants.
- It also brings simplicity, efficiency and accountability in government.

(2) The main disadvantage concerning e-government is the lack of equality in public access to the internet, reliability of information on the web, and hidden agendas of government groups that could influence and bias public opinions.

(3) E-Learning is learning utilizing electronic technologies to access educational curriculum outside of a traditional classroom. In most cases, it refers to a course, program or degree delivered completely online.

- **Advantages of E-learning:-**
  - E-learning saves time and money.
  - E-learning leads to better retention
  - E-learning is reliable
  - E-learning is scalable
  - E-learning offers personalization.

UNIT - IV

GROUP - C : LONG TYPE QUESTIONS

(1) What is E-Governance? Discuss Social impact of E-Governance.

(2) Discuss E-Government web sites and E-Governance challenge.

(3) Describe few E-Initiatives of Government of Odisha.

(4) What are the principles of E-Kranti?

(5) What is E-Learning? Discuss its benefits to students.

(6) Outline the address of some of E-Learning portals.

UNIT - IV

GROUP - C : ANSWER

(1) E-Governance is the application of information and communication technology (ICT) for delivering government services, exchange of information, communication transactions, integration of various stand-alone systems between Government-to-Citizen (G2C), Government-to-Business (G2B), Government-to-Government (G2G), Government-to-Employees (G2E).

Social impact of E-Governance

(a) Increased Transparency

Although few Governments have explicitly stated transparency as a goal, some transparency gains have been achieved through e-applications.

(b) Increasing Efficiency and Effectiveness of Service

Delivery some of the efficiency benefits reported by different applications are:

- Faster processing, shorter wait, and shorter queues
- Less number of trips to Government offices: saves transport cost and avoids wage loss.
- More accurate and legible documents, easy recovery from errors, better reception areas.
- Lesser corruption and more transparency
- Improved access to offices (delivery points are closer and sometimes available (24 x7).

(c) Reduce Corruption through E-governance

E-Government applications reduce corruption in the public sector:

- Introduce transparency in data, decisions/actions, rules, procedures and performance of Government agencies.
- Automates processes to take away discretion from civil servants to delay and deny a service.
- Provide a convenient entry point for simplification of rules and re- engineering processes. Almost all applications have done partial re-engineering.

- Make decisions traceable so that action can be taken in case of a complaint.
- Builds accountability by providing greater access to information through web publishing to civil society groups.
- Provides documentation to citizens for follow up action in case they wish to file a complaint.
- Modularizes tasks making outsourcing possible.
- Introduces competition amongst electronic delivery channels and departmental counters that provide a service.
- Standardization of comments/objections on petitions and applications of citizens leads to effective supervision.
- Centralizes data becomes available for better audit and analysis. This feature is being used effectively by e-tax applications. Integration of data across applications provides improved intelligence. Enables unbiased sampling for audit purposes.

(2) **Web Sites**

Top E-Government sites that are great resource in-case you are searching for most popular government sites in India.

(a) National Informatics Centre - https://www.nic.in is the premier web technology organization of India's Union Government. It has played a pivotal role in steering e-governance applications in the governmental departments at national, state and district levels.

(b) Indian Railways - https://www.indianrail.gov.in - The official site with information on trains, fares and availability.

(c) Staff Selection Commission - https://www ssc.nic.in - Makes recruitment to nontechnical group 'C' and group 'B' non gazetted posts in Ministries/ Departments of the Government of India, the C.A.G, and the offices of the Accountant General.

(d) Reserve Bank of India - https://www rbi.org.in - Monetary authority, regulator and supervisor of the financial system, manager of exchange control and issuer of the national currency.

(e) Union Public Service Commission - https://www upsc.gov.in - Recruitment and examination schedules conducted by the organization.

(d) Income Tax Department - https://www incometaxindia.gov.in - Tax law, rules, and notifications. Tax return and other forms available for download.

(e) National Portal of India - https://www.india.gov.in - Official website with access to information and services being provided by the Indian Government.

E-Governance Challenges

- E-governance is facing numerous challenges world over.
- These challenges are arising from administrative, legal, institutional and technological factors.
- There are a large number of obstacles in implementation of e-Governance in India.
- These can be categorized under the following titles: Environmental and Social Challenges, Economical Challenges and Technical Challenges.

(3) Few E-Initiatives of Government of Odisha are:

(a) **Online Issuance of disability Certificates**

Disability certificates are necessary for different purposes such as availing benefits related to education, employment or various Government scheme applicable for disable persons. The online certification covers majorly five types of disabilities - Visual Impairment, Hearing Impairment, Physical Impairment, Mental Retardation and Mental Illness.

- **Services offered**
  - o Online application for disability certificate
  - o Re-application for disability certificate
  - o Verify disability certificate

(b) **Bhulekh - Land Record Web portal of Odisha**

Bhulekh is software which provides online information on land records. It is an initiative taken up by Directorate of Land Records & Surveys, Government of Odisha. The software enables optimized maintenance of records and provides accurate copies of Records of Rights (RoR) to the landowners all across the state.

- **Services offered**
  - o RoR Information for 171 tehsils of Odisha now available on Internet
  - o Land Pass Book Application Form
  - o Maps
  - o Forms
  - o Application for land pass book
  - o Application for issue of miscellaneous certificate
  - o Application for mutation of land records
  - o Application for settlement of lands
  - o Odisha government land settlement rules
  - o Application of a raiyat for conversion of agricultural land

(c) **E-Shishu**

'E-Shishu', is a project implemented by Odisha Primary Education Program. It is the first of its kind in the country. The project has two components:

- Child Tracking system (CTS) and
- Intervention monitoring & Information system (IMIS)
- CTS is a comprehensive database of all children below 14 years. It includes their socio-economic as well as demographic details.
- IMIS, enables online monitoring of all the 14 interventions under Sarva Shiksha Abhiyan.
- Features
  - o Tracks status of enrolled, never enrolled & dropout children of age group of 6-14
  - o Allows Government/Parents/Common man to track their child's status in the school.
  - o Provides district wise school data

(d) **e-Abhijoga**

Centralized Public Grievances Redress And Monitoring System of the Odisha State.

- Services provided
  - o You can file your grievance
  - o Lodge reminder / clarification
  - o View action status

(e) **e-Literacy**

e-Literacy' is an initiative by the Information Technology Department, Government of India. The initiative has enabled the creation of state-of-the-art training facility at Secretariat, to provide basic as well as specialized courses on IT. Training is provided to government employees at all levels, as per pre-planned calendar of training programs throughout the year.

(4) **The key principles of e-Kranti are as follows:**

(a) **Transformation and not Translation -** All project proposals in e-Kranti must involve substantial transformation in the quality, quantity and manner of delivery of services and significant enhancement in productivity and competitiveness.

(b) **Integrated Services and not Individual Services -** A common middleware and integration of the back end processes and processing systems is required to facilitate integrated service delivery to citizens.

(c) **Government Process Reengineering (GPR) to be mandatory in every MMP -** To mandate GPR as the essential first step in all new MMPs without which a project may not be sanctioned. The degree of GPR should be assessed and enhanced for the existing MMPs.

(d) **ICT Infrastructure on Demand -** Government departments should be provided with ICT infrastructure, such as connectivity, cloud and mobile platform on demand. In this regard, National Information Infrastructure (NII), which is at an advanced stage of project formulation, would be fast-tracked by DeitY.

(e) **Cloud by Default -** The flexibility, agility and cost effectiveness offered by cloud technologies would be fully leveraged while designing and hosting applications. Government Cloud shall be the default cloud for Government Departments. All sensitive information of Government Departments shall be stored in a Government Cloud only. Any Government Department may use a private cloud only after obtaining permission from Department of Electronics and Information Technology which shall do so after assessing the security and privacy aspects of the proposed cloud.

(vi) **Mobile First -** All applications are designed/ redesigned to enable delivery of services through mobile.

(vii) **Fast Tracking Approvals -** To establish a fast-track approval mechanism for MMPs, once the Detailed Project Report (DPR) of a project is approved by the Competent Authority, Empowered Committees may be constituted with delegated powers to take all subsequent decisions.

(viii) **Mandating Standards and Protocols -** Use of e-Governance standards and protocols as notified by DeitY be mandated in all e-governance projects.

(ix) **Language Localization -** It is imperative that all information and services in e-Governance projects are available in Indian languages as well.

(x) **National GIS (Geo-Spatial Information System) -** NGIS to be leveraged as a platform and as a service in e-Governance projects.

(xi) **Security and Electronic Data Preservation -** All online applications and e-services to adhere to prescribed security measures including cyber security. The National Cyber Security Policy 2013 notified by DeitY must be followed.

(5) A learning system based on formalized teaching but with the help of electronic resources is known as E-learning. While teaching can be based in or out of the classrooms, the use of computers and the Internet forms the major component of E-learning.

- **Benefit to Students (learner)**
  - o ***Online Learning :-*** The online method of learning is best suited for everyone
  - o ***Quick Delivery of Lessons:-*** E-Learning is a way to provide quick delivery of lessons. As compared to traditional classroom teaching method, this mode has relatively quick delivery cycles
  - o ***Reduced Costs:-*** E-Learning is cost effective as compared to traditional forms of learning. The reason for this price reduction is because learning through this mode happens quickly and easily. A lot of training time is reduced with respect to trainers, travel, course materials, and accommodation.
  - o ***Less Impact on Environment:-*** As E-Learning is a paperless way of learning, it protects the environment to a lot of extent.

(6) Outline the address of some of E-Learning portals.

Name	Website	Purpose
Khan Academy, Established-2006	https://www.khanacademy.org	Khan Academy is a non-profit educational organization created by educator Salman Khan with an aim of providing a free, world-class education for anyone, anywhere. It produces short lectures via YouTube videos. All resources are free of cost to anyone around the world and its videos are translated into 36 languages including English as their main language. As of 2015, it has more than 5,000 courses.
Coursera, Established - 2012	https://www.coursera.org	Coursera tie up with many universities and institutions provide students free online courses.
W3 School Established-1998	https://www.w3schools.com	Teaching students the various aspect of web design.
Codecademy Established – 2011	https://www.codecademy.com	Allow student to select their goal/learning objective and recommending proper courses to that students.
Tata Interactive Systems, Established-1990	www.tatainteractive.com	It is one of the top E-learning companies in India to provide all kind of online education at one place. With a team of over 350 multi-disciplinary awards and was featured as the top 20 training outsourcing companies globally for the last 7 years.

SAMPLE QUESTION

INFORMATION TECHNOLOGY

(+2 1st Year Science)

Time- 3 Hours **Full Marks-70**

The figures in the right hand margin indicate marks.

Answer all questions from Group-A, Ten bits from Q. No. 3, Three bits from Q. No. 4 of Group-B and three questions from Group-C

GROUP-A

1. Choose the correct answer: **[1x10=10]**

a) A _____is a group of wires on the main circuit board of the computer.
(i) Bus (ii) RAM
(iii) CPU (iv) Keyboard

b) An *output device* of computer is _____.
(i) Keyboard (ii) Mouse
(iii) Bar code reader (iv) Printer

c) The _____ acts as an interface between the human and the computer.
(i) Operating System (ii) Memory
(iii) CPU (iv) None of these

d) Which is not an *operating system*?
(i) DOS (ii) Window
(iii) Linux (iv) Antivirus

e) *Java Swing* is a part of _____ that is used to create window-based applications.
(i) JFC (ii) GUI
(iii) JVM (iv) None of these

f) _____ class create a labeled button.
(i) JLabel (ii) JList
(iii) JButton (iv) JTextField

g) Which SQL language the *GRANT* command belongs.
(i) DDL (ii) DML
(iii) DCL (iv) TCL

h) *Cardinality* of a relation is the number of _____.
(i) Rows (ii) Columns
(iii) Keys (iv) Primary keys

i) *CREATE* command is a _____command.
(i) DDL (ii) DCL
(iii) DML (iv) TCL

j) Which of the following command is a SQL *TCL* command?
(i) ALTER (ii) SELECT
(iii) GRANT (iv) COMMIT

2. Expand the followings: **[1x10=10]**

a) EPROM b) CPU c) RAM d) OS
e) 4GL f) AWT g) GUI h) RDBMS
i) SQL j) DML

GROUP-B

3. Answer any ten of the following questions within 30 words each: **[2x10=20]**

(a) PROM

(b) Cache memory

(c) Register

(d) Distinguish between Sequential access and direct access devices

(e) Antivirus

(f) While loop

(g) JTextArea

(h) Primary key

(i) DBMS

(j) DDL command

(k) DML command

(l) MYSQL

4. Answer any *three* questions within 50 words each: **[3x3=9]**

(a) Name the types of primary storage devices.

(b) What are different types of software?

(c) What is Boolean type? Explain with an example.

(d) What is cardinality of a relation?

(e) Write some DML commands.

GROUP-C

Answer any three of the following questions. **[7x3=21]**

5. What is Operating System? Discuss different types of operating system.

6. Discuss different types of register.

7. Write a program using java swing components.

8. Explain three views of data.

9. Discuss classifications of SQL commands.

SAMPLE QUESTION

INFORMATION TECHNOLOGY

(+2 1st Year Science)

ANSWER KEY

GROUP-A

1. a) (i) Bus

b) (iv) Printer

c) (i) Operating System

d) (iv) Antivirus

e) (i) JFC

f) (iii) JButton

g) (iii) DCL

h) (i) Rows

i) (i) DDL

j) (iv) COMMIT

2. a) EPROM – Erasable Programmable Read Only Memory

b) CPU – Central Processing Unit

c) RAM – Random Access Memory

d) OS- Operating System

e) 4GL- 4th Generation Language

f) AWT- Abstract Window Toolkit

g) GUI- Graphical User Interface

h) RDBMS- Relational Database Management System

i) SQL- Structured Query Language

j) DML- Data Manipulation Language


WWW
WWW
WWW