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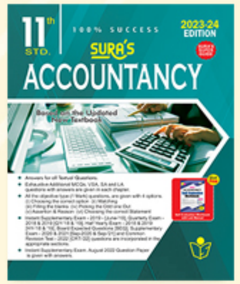

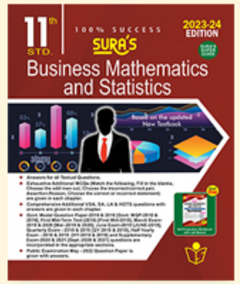

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- Instant Supplementary Exam **August 2022** Question Paper is given with answers.

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Mr. Shanmugasundaram

(Post Graduate Teacher, Chennai)

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UNIT- I

FUNDAMENTALS OF COMPUTER AND WORKING WITH A TYPICAL OPERATING SYSTEMS (WINDOWS & LINUX)

CHAPTER 1 Introduction to Computers

CHAPTER SNAPSHOT

EVALUATION

SECTION - A

CHOOSE THE CORRECT ANSWER

1. First generation computers used *[HY. 2019]*

(a) Vacuum tubes (b) Transistors
(c) Integrated circuits (d) Microprocessors

[Ans. (a) Vacuum tubes]

2. Name the volatile memory

(a) ROM (b) PROM
(c) RAM (d) EPROM

[Ans. (c) RAM]

3. Identify the output device *[Mar. 2020]*

(a) Keyboard (b) Memory
(c) Monitor (d) Mouse

[Ans. (c) Monitor]

4. Identify the input device *[FMT 2018]*

(a) Printer (b) Mouse
(c) Plotter (d) Projector

[Ans. (b) Mouse]

5. ..... Output device is used for printing building plan.

(a) Thermal printer (b) Plotter
(c) Dot matrix (d) inkjet printer

[Ans. (b) Plotter]

6. Which one of the following is used to in ATM machines

(a) Touch Screen (b) Speaker
(c) Monitor (d) Printer

[Ans. (a) Touch Screen]

7. When a system restarts which type of booting is used.

(a) Warm booting (b) Cold booting
(c) Touch boot (d) Real boot.

[Ans. (a) Warm booting]

8. Expand POST *[FMT 2018; Sep. 2020]*

(a) Post on self Test
(b) Power on Software Test
(c) Power on Self Test
(d) Power on Self Text

[Ans. (c) Power on Self Test]

9. Which one of the following is the main memory?

(a) ROM (b) RAM
(c) Flash drive (d) Hard disk

[Ans. (b) RAM]

10. Which generation of computer used IC's? *[May '22]*

(a) First (b) Second (c) Third (d) Fourth

[Ans. (c) Third]

SECTION - B

VERY SHORT ANSWERS

1. What is a computer? *[Sep. 2021; Aug '22]*

Ans. **(i)** A computer is an electronic device that manipulates information, or data. It has the ability to store, retrieve, and process data.

(ii) Computer works faster than human being and given the values more accuracy and reliable

2. Distinguish between data and information. *[FMT 2018]*

Ans.

Data	Information
Data is defined as an unprocessed collection of raw facts, suitable for communication, interpretation or processing.	Information is a collection of facts from which conclusions may be drawn.
(Eg) 134, 16, 'Kavitha', 'C'	**(Eg)** Kavitha is 16 years old.

3. What are the components of a CPU? *[Sep. 2020]*

Ans. The CPU has three components which are Control unit, Arithmetic and Logic unit (ALU) and Memory unit.

4. What is the function of an ALU? *[Mar. 2020]*

Ans. **(i)** The ALU performs arithmetic operations.

(ii) The result of an operation is stored in internal memory of CPU.

(iii) The logical operations of ALU promote the decision making ability of a computer.

5. Write the functions of control unit.

Ans. The control unit controls the flow of data between the CPU, memory and I/O devices. It also controls the entire operation of a computer.

6. What is the function of memory?

Ans. The primary memory is used to temporarily store the programs and data when the instructions are ready to execute. The secondary memory is used to store the data permanently.

7. Differentiate Input and Output unit.

Ans.

Input Unit	Output Unit
Input unit is used to feed any form of data to the computer, which can be stored in the memory unit for further processing.	An output unit is any hardware component that conveys information to users in an understandable form.
Example : Keyboard, mouse etc.	**Example :** Monitor, Printer etc.

8. Distinguish Primary and Secondary memory.

Ans.

Primary Memory	Secondary Memory
It is used to temporarily store the programs and data when the instructions are ready to execute.	It is used to store the data permanently.
It is volatile, the content is lost when the power supply is switched off. Eg. RAM.	It is non-volatile, the content is available even after the power supply is switched off. Eg. ROM, CD-ROM, DVD ROM.

SECTION - C

SHORT ANSWERS

1. What are the characteristics of a computer?

Ans. **(i)** Computer is the powerful machine.

(ii) It can perform large number of tasks.

(iii) The main capacities of computer are work length, speed accuracy, diligence, versatility memory and automation and lots of more tasks.

2. Write the applications of computer.

Ans. The various applications of computers are,

(i) Business **(ii)** Education
(iii) Marketing **(iv)** Banking
(v) Insurance **(vi)** Communication
(vii) Health care
(viii) Engineering - Robotics, Nano technology, Bio Engineering

3. What is an input device? Give two examples.

Ans. Input device is used to feed any form of data to the computer, which can be stored in the memory unit for further processing.

Example: Keyboard, Mouse, Scanner, Fingerprint scanner, Track Ball, Retinal Scanner, Light pen etc.

4. Name any three output devices.

Ans. **(i)** Monitor
(ii) Printer
(iii) Plotter
(iv) Speaker
(v) Multimedia projectors are the output devices.

5. Differentiate optical and Laser mouse. *[HY. 2018]*

Ans.

Optical Mouse	Laser Mouse
Measures the motion and acceleration of pointer.	Measures the motion and acceleration of pointer.
It uses light source instead of ball to judge the motion of the pointer.	Laser Mouse uses Laser Light.
Optical mouse is less sensitive towards surface.	Laser Mouse is highly sensitive and able to work on any hard surface.

6. Write short note on impact printer. *[Mar. 2019]*

Ans. **Impact printers :**

(i) These printers print with striking of hammers or pins on ribbon. These printers can print on multi-part (using carbon papers) by using mechanical pressure. For example, Dot Matrix printers and Line matrix printers are impact printers.

(ii) A Dot matrix printer that prints using a fixed number of pins or wires.

(iii) Line matrix printers use a fixed print head for printing.

7. Write the characteristics of sixth generation. *[May '22]*

Ans. **(i)** Parallel and Distributed computing
(ii) Computers have become smarter, faster and smaller
(iii) Development of robotics
(iv) Natural Language Processing
(v) Development of Voice Recognition Software

8. Write the significant features of monitor.

Ans. **Monitor:**

(i) Monitor is the most commonly used output device to display the information. It looks like a TV.

(ii) Pictures on a monitor are formed with picture elements called PIXELS.

(iii) Monitors may either be Monochrome which display text or images in Black and White or can be color, which display results in multiple colors.

(iv) There are many types of monitors available such as CRT (Cathode Ray Tube), LCD (Liquid Crystal Display) and LED (Light Emitting Diodes).

(v) The video graphics card helps the keyboard to communicate with the screen.

(vi) It acts as an interface between the computer and display monitor.

SECTION - D

EXPLAIN IN DETAIL

1. Explain the basic components of a computer with a neat diagram. *[Govt. MQP; FMT-2018; Mar. 2019]*

Ans. **Components of a Computer :**

The computer is the combination of hardware and software. Hardware is the physical component of a computer like motherboard, memory devices, monitor, keyboard etc., while software is the set of programs or instructions. Both hardware and software together make the computer system to function. Every task given to a computer follows an Input-process - output cycle (IPO cycle).

(i) **Input unit :** Input unit is used to feed any form of data to the computer, which can be stored in the memory unit for further processing.

Example : keyboard, mouse etc.

(ii) **Central Processing Unit :** CPU is the major component which interprets and executes software instructions. It also control the operation of all other components such as memory, input and output units.

GOVERNMENT EXAM QUESTIONS AND ANSWERS

1 MARK

1. How many types of Booting process in system ?
(a) 3 (b) 2 *[QY. 2018]*
(c) 5 (d) 4 **[Ans. (b) 2]**

2. Which of the following is a Third generation computers? *[Govt.MQP-2018]*
(a) Vacuum tubes (b) Transistor
(c) Integrated Circuits (d) Microprocessor
[Ans. (b) Transistor]

3. Which one of the following is Biometric Device? *[QY. 2018]*
(a) Scanner (b) Fingerprint Scanner
(c) Light Pen (d) Mouse
[Ans. (b) Fingerprint Scanner]

4. Identify the Input device ..... . *[FMT 2018]*
(a) Printer (b) Mouse
(c) Plotter (d) Projector **[Ans. (b) Mouse]**

5. Expansion of GUI is ..... . *[QY. 2018]*
(a) Graphics User Interface
(b) Graphical User Information
(c) Geographical User Information
(d) Graphical User Interface
[Ans. (d) Graphical User Interface]

6. Which generation of computer used Transistors?
(a) First (b) Second *[June 2019]*
(c) Third (d) Fourth **[Ans. (b) Second]**

7. Plotter is a _____ device. *[QY. 2019]*
(a) storage (b) input
(c) output (d) memory **[Ans. (c) output]**

8. Line printers are capable of printing much more than _____ lines per minute. *[QY. 2019]*
(a) 1000 (b) 1200 (c) 1500 (d) 1300
[Ans. (a) 1000]

9. Which Generations of computer used ULSI?
(a) Third (b) Fourth *[HY. 2018]*
(c) Fifth (d) Sixth **[Ans. (c) Fifth]**

10. Expand ULSI. *[Sep. 2021]*
(a) Ultra Large Scale Information
(b) Ultra Low Scale Integration
(c) Ultra Low Software Integration
(d) Ultra Large Scale Integration
[Ans. (d) Ultra Large Scale Integration]

11. In _____ generation portable computers were introduced. *[CRT '22]*
(a) First (b) Second
(c) Third (d) Fourth **[Ans. (d) Fourth]**

12. _____ is first known Calculating Device. *[CRT '22]*
(a) Computer (b) Analytical Engine
(c) Abacus (d) Calculator **[Ans. (c) Abacus]**

13. _____ is the main component of Second Generation computers. *[Aug '22]*
(a) Vacuum tubes (b) Transistors
(c) Integrated circuits (d) Microprocessors
[Ans. (b) Transistors]

2 MARKS

1. Expand (i)BIOS (ii)ENIAC (iii)RAM (iv)ALU *[Govt.MQP-2018]*

Ans.
(i) BIOS - Basic Input Output System.
(ii) ENIAC - Electronic Numerical Integrator And Calculator.
(iii) RAM - Random Access Memory
(iv) ALU - Arithmetic and Logic unit

2. Give examples for Impact and Non impact printers. *[FMT 2018]*

Ans. **Impact :** Dot Matrix printer and line dot matrix printer.
Non - Imapct : Laser printer and Inkjet printer.

3. Write short note on registers. *[FMT 2018]*

Ans. Registers are the high-speed temporary storage locations in the CPU. Hence, their contents can be handled much faster than the contents of memory.

4. Write Demerits of Artificial Intelligence. *[QY. 2018]*

Ans.
(i) Machines need repairing and maintenance which need plenty of cost.
(ii) The increasing number of machines leading to unemployment and job security issues.

5. Write notes on fifith generation computers.

Ans. *[QY. 2019]*
(i) Parallel Processing
(ii) Super conductors
(iii) Computers size was drastically reduced.
(iv) Can recognise Images and Graphics
(v) Introduction of Artificial Intelligence and Expert Systems
(vi) Able to solve high complex problems including decision making and logical reasoning

3 MARKS

1. Write the mechanism of laser mouse. *[FMT 2018]*

Ans.
(i) Measures the motion and acceleration of pointer.
(ii) Laser mouse uses laser light.
(iii) Laser mouse is highly sensitive and able to work on any hard surface.

2. Write the sequence of steps in boot process? (or) Explain the types of booting in computer. *[Govt.MQP, FMT-2018; HY. 2019]*

Ans. Booting process is of two types.

(i) Cold Booting (ii) Warm Booting

(i) Cold Booting: When the system starts from initial state i.e. it is switched on, we call it cold booting or Hard Booting. When the user presses the Power button, the instructions are read from the ROM to initiate the booting process.

(ii) Warm Booting: When the system restarts or when Reset button is pressed, we call it Warm Booting or Soft Booting. The system does not start from initial state and so all diagnostic tests need not be carried out in this case. There are chances of data loss and system damage as the data might not have been stored properly.

Differentiate optical mouse and laser mouse.

3. Write notes on multimedia projector. *[QY. 2019]*

Ans. **(i)** Multimedia projectors are used to produce computer output on a big screen.

(ii) These are used to display presentations in meeting halls or in classrooms.

4. How Finger Print Scanner Working? *[QY. 2018]*

Ans. **Finger print Scanner:** Fingerprint Scanners is a fingerprint recognition device used for computer security, equipped with the fingerprint recognition feature that uses biometric technology. Fingerprint Reader / Scanner is very safe and convenient device for security instead of password, that is vulnerable to fraud and is hard to remember.

5 Marks

1. Short answer on the following: *[QY. 2018]*

a) Data b) Hardware

c) Natural Language Processing

d) Types of Memory e) Bit

Ans. **(a) Data :** The term data comes from the word datum, which means a raw fact. The data is a fact about people, places or some objects.

(b) Hardware : Hardware is the physical component of a computer like motherboard, memory devices, monitor, keyboard etc.,

(c) Natural Language Processing : Natural Language Processing is a method used in artificial intelligence to process and derive meaning from the human language.

(d) Types of Memory : The memory unit is of two types - Primary memory, Secondary memory.

(e) Bit : Machine language is a collection of binary digits or bits that the computer reads and interprets.

2. Differentiate Impact Printers and Non-Impact Printers. *[QY. 2019]*

Ans.

S.No	Impact Printers	Non-Impact Printers
1.	It uses ribbons / carbon papers to leave the impressions on the paper.	It use ink cartridges and the impressions appear on the paper with the flow of ink.
2.	The quality of printing is a draft quality.	The quality of printing is a high quality.
3.	Striking Mechanism used to produce output.	No striking mechanism used to produce output.
4.	Faster speeds around 250 words per second,	Slower speeds around 1 page per seconds.
5.	**Example :** Dot Matrix printers and line matrix printers	**Example :** Laser printers and Inkjet printers.

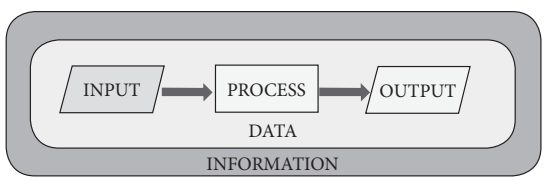
3. Explain Data and Information. *[CRT & May '22]*

Ans. Computer is an electronic device that processes the input according to the set of instructions provided to it and gives the desired output at a very fast rate. Computers are very versatile as they do a lot of different tasks such as storing data, weather forecasting, booking airlines, railway or movie tickets and even playing games.

Data: Data is defined as an un-processed collection of raw facts, suitable for communication, interpretation or processing.

For example, 134, 16 'Kavitha', 'C' are data. This will not give any meaningful message.

Information: Information is a collection of facts from which conclusions may be drawn. In simple words we can say that data is the raw facts that is processed to give meaningful, ordered or structured information. For example Kavitha is 16 years old. This information is about Kavitha and conveys some meaning. This conversion of data into information is called data processing.



ADDITIONAL QUESTIONS AND ANSWERS

CHOOSE THE CORRECT ANSWERS 1 MARK

I. CHOOSE THE CORRECT OPTIONS FOR THE BELOW QUESTIONS.

1. Which of the following led us today to extremely high speed calculating device?
(a) Laptop (b) Tabulating Machine
(c) Abacus (d) ENIAC
[Ans. (c) Abacus]

2. In which year the concept of the analytical engine was invented?
(a) 1837 (b) 1910 (c) 1991 (d) 1836
[Ans. (a) 1837]

3. Which of the following period the first generation computers belongs?
(a) 1956-1963 (b) 1940-1956
(c) 1964-1971 (d) 1980-1990
[Ans. (b) 1940-1956]

4. Which of the following is not a first generation computers?
(a) ENIAC (b) EDVAC
(c) UNIVAC 1 (d) IBM1401
[Ans. (d) IBM1401]

5. Which component used in third generation computers?
(a) Vacuum Tubes (b) Transistors
(c) IC (d) Microprocessor
[Ans. (c) IC]

6. In which generation, the Voice Recognition software developed?
(a) Sixth (b) Fourth (c) Third (d) Second
[Ans. (a) Sixth]

7. Which generation gave a start to parallel computing?
(a) fourth (b) fifth (c) sixth (d) seventh
[Ans. (c) sixth]

8. Which of the following is not a form of parallel computing?
(a) bit level (b) instruction level
(c) task parallelism (d) Robotics
[Ans. (d) Robotics]

9. Which of the following holds the data and instructions during the processing?
(a) Input unit (b) output unit
(c) Memory unit (d) Software
[Ans. (c) Memory unit]

10. Which unit does the processing of data?
(a) CPU (b) Registers
(c) Input unit (d) Output unit
[Ans. (a) CPU]

11. Which of the following is the heart of the computer?
(a) CPU (b) HDD (c) SDD (d) ANN
[Ans. (a) CPU]

12. Which of the following operations of ALU promote decision -making ability of a computer?
(a) Logical (b) Relational
(c) Arithmetic (d) Binary
[Ans. (a) Logical]

13. Which of the following is not a non volatile memory?
(a) ROM (b) Hard disk
(c) CD-ROM (d) RAM
[Ans. (d) RAM]

14. Who invented the computer mouse?
(a) Douglas Engelbart (b) Bill English
(c) Apple Lisa (d) Henry Babbage
[Ans. (a) Douglas Engelbart]

15. Which device works like a xerox machine?
(a) Retinal scanner (b) OCR
(c) OMR (d) Scanner
[Ans. (d) Scanner]

16. Which device is very safe and convenient for security instead of password?
(a) Scanner (b) Fingerprint Scanner
(c) Track ball (d) Retinal Scanner
[Ans. (b) Fingerprint Scanner]

17. Which of the following device uses CCD Electronic chip?
(a) OCR (b) BCR
(c) Voice Input Systems (d) Digital Camera
[Ans. (d) Digital Camera]

18. **In which device the keys are arranged in a cluster?**
(a) Keyboard (b) Keyer
(c) Barcode Reader (d) Touch Screen
[Ans. (b) Keyer]

19. **Who was the inventor of the electronic digital computer?**
(a) John Vincent Atanasoft
(b) J. Presper Eckert
(c) John Mauchly
(d) Charles babbage
[Ans. (a) John Vincent Atanasoft]

20. **Which company developed first digital computer?**
(a) Atanasoft Berry Computer
(b) AT & T bell
(c) IBM
(d) Microsoft
[Ans. (a) Atanasoft Berry Computer]

21. **Which of the following are the computer systems inspired by the biological neural networks?**
(a) NLP (b) IBM
(c) Robotics (d) ANN **[Ans. (d) ANN]**

22. **Which of the following has become the dominant paradigm in computer architecture?**
(a) Parallel computing
(b) parallel processing
(c) Multi tasking
(d) Multi processing **[Ans. (a) Parallel computing]**

23. **Which of the following concerned with the interactions between computers and human language?**
(a) Artificial Neurons
(b) Neural network
(c) Artificial intelligence
(d) Natural language processing
[Ans. (c) Artificial intelligence]

24. **Which of the following is the logical machine which interprets and executes software instructions?**
(a) CPU (b) ALU
(c) Control Unit (d) Memory Unit
[Ans. (a) CPU]

25. **How many classification of memories in memory unit?**
(a) 2 (b) 3
(c) 4 (d) more than 2
[Ans. (a) 2]

26. **How many types of Keyboards used to input the data?**
(a) 3 (b) 2 (c) 4 (d) 5
[Ans. (a) 3]

27. **How many types of pointing device are there?**
(a) 2 (b) 3 (c) 1 (d) Many
[Ans. (a) 2]

28. **Which mouse has as many as 12 buttons?**
(a) Laser (b) Optical
(c) Mechanical (d) Both a and b
[Ans. (a) Laser]

29. **Which printer do not use striking mechanism for printer?**
(a) Inkjet (b) Laser
(c) Thermal (d) All of these
[Ans. (d) All of these]

30. **Which device is used to produce computer output on a big screen?**
(a) Monitor (b) LED
(c) Projector (d) Monochrome Monitor
[Ans. (c) Projector]

31. **Which of the following is the diagnostic testing sequence of the computer hardware?**
(a) POST (b) BIOS (c) MAR (d) MBR
[Ans. (a) POST]

32. **Which of the following issue an error message if any computer hardware not defected?**
(a) BIOS (b) BUS (c) RAM (d) POST
[Ans. (a) BIOS]

33. **Which device produce graphical output on papers?**
(a) Scanner (b) Touch Screen
(c) Plotter (d) Track ball
[Ans. (c) Plotter]

34. **Which code checks partition table for an active partition in a computer?**
(a) MBR (b) Marse (c) Binary (d) Object
[Ans. (a) MBR]

3. Name the Third generation computers.

Ans. IBM 360 Series, Honeywell 6000 series.

4. Name the softwares introduced in fifth generation computers.

Ans. **(i)** Artificial Intelligence
(ii) Expert Systems

5. Name the types of computer introduced in Fourth generation computers.

Ans. **(i)** Microcomputer
(ii) Portal Computers.

6. Write the developments of Sixth generation computers.

Ans. **(i)** Parallel Computing
(ii) Artificial Neural Networks
(iii) Robotics
(iv) Natural Language Processing

7. What is NLP?

Ans. Natural Language Processing is the ability of a computer program to understand human language. It is a component of artificial intelligence.

8. What is the use of Microphone?

Ans. Microphone serves as a voice Input device. It captures the voice data and send it to the Computer.

9. Write a note on Digital Camera.

Ans. It captures images / videos directly in the digital form. It uses a CCD (Charge Coupled Device) electronic chip. When light falls on the chip through the lens, it converts light rays into digital format.

10. What is use of VGA?

Ans. The screen monitor works with the VGA (Video Graphics Array). The video graphics card helps the keyboard to communicate with the screen. It acts as an interface between the computer and display monitor. Usually the recent motherboard incorporates built in video card.

11. Write the two main categories of Printer.

Ans. Printers are divided into two main categories:

(i) Impact Printers
(ii) Non Impact printers

12. What is booting a computer?

Ans. Booting a computer is to load an operating system into the computer's main memory or random access memory (RAM).

13. What makes Charles Babbage the father of computing?

Ans. Charles Babbage radical ideas and concept of the Analytical Engine (It contained an ALU, basic flow control and integrated memory) makes him the father of computing.

14. What is the goal of neural network approach?

Ans. The original goal of the neural network approach was to solve problems in the same way that a human brain would. Over time, attention focused on matching specific mental abilities, leading to deviations from biology.

15. Write the tools in which nano technology was born.

Ans. The right tools, such as the scanning tunneling microscope (STM) and the atomic force microscope (AFM), the age of nano-technology was born.

16. Define IPO Cycle.

Ans. The functional components of a computer performs. Every task given to a computer follows an Input-Process- Output Cycle (IPO cycle).

17. Name the different keys available in the keyboard.

Ans. There are different set of keys available in the keyboard such as character keys, modifier keys, system and GUI keys, enter and editing keys, function keys, navigation keys, numeric keypad and lock keys.

18. Which device is used to draw a lines?

Ans. Light Pen is an input device which is used to draw lines or figures on a computer screen. It is touched to the CRT screen where it can detect faster on the screen as it passes.

19. Define Pixels.

Ans. Pictures on a monitor are formed with picture elements called PIXELS.

20. Name the types of Monitors available.

Ans. The types of monitors available such as CRT (Cathode Ray Tube), LCD (Liquid Crystal Display) and LED (Light Emitting Diodes).

21. How the date travel through control bus?

Ans. The date travel in both unidirectional and bidirectional due to the internal connection with in the computer architecture.

22. Name the type of registers are essential for instruction execution.

Ans. **(i)** Program counter
(ii) Instruction Register
(iii) Memory Address Registers
(iv) Memory Buffer Register
(v) Accumulator

23. Expand (a) MAR (b) MBR

Ans. **(a)** MAR - Memory Address Register
(b) MBR - Memory Buffer Register

24. Why POST is essential?

Ans. If the hardware is not detected, a particular pattern of beeps will inform about the error. An error found in the POST is usually fatal (that is, it causes current program to stop running) and will halt the boot process, since the hardware check is absolutely essential for the computer's functions.

25. What does reboot mean?

Ans. It means to reload the operating system.

26. Write the limitations of impact printer.

Ans. **(1)** It is slow as compared to non-impact printers
(2) It is not best suited for graphics
(3) It is not possible to obtain colour output.

Short Answers 3 MARKS

1. Write a note Vaccum tube.

Ans. **(i)** Vaccum tubes contain electrodes for controlling electron flow and were used in early computers as a switch or an amplifier.
(ii) Vaccum tubes are big in size and consumed more power.

2. Define Transistor.

Ans. **(i)** The transistor ("transfer resistance") is made up of semi-conductors.
(ii) It is a component used to control the amount of current or voltage used for amplification/ modulation or switching of an electronic signal.

3. Define Punched cards.

Ans. Punch cards also known as Hollerith cards are paper cards containing several punched or perforated holes that were punched by hand or machine to represent data.

4. Differentiate Dot Matrix Printer and Laser Printer.

Ans.

Dot Matrix Printer	Laser Printer
Printing speed is slow.	Printing speed is high.
Suitable for black and white printing.	Suitable of colour printing.
It makes noise while printing.	It is silent while printing.

5. What is Machine language?

Ans. **(i)** Machine language is a collection of binary digits or bits that the computer reads and interprets.
(ii) In first generation, machined language was used.

6. What is Integrated circuits?

Ans. **(i)** IC is short for Integrated Circuit or Integrated Chip.
(ii) The IC is a package containing many circuits, pathways, transistors, and other electronic components all working together to perform a particular function or a series of functions.

7. What is Robotics?

Ans. **(i)** Robot is a term coined by Karel Capek in the 1921 play RUR (Rossum's Universal Robots).
(ii) It is used to describe a computerized machine designed to respond to input received manually or from its surroundings.

8. What is Nano-technology?

Ans. Nano-technology, is an engineering, science, and technology that develops machines or works with one atom or one molecule that is 100 nanometers or smaller.

9. Write a note on Touch Screen.

Ans.
(i) A touch screen is a display device that allows the user to interact with a computer by using the finger.
(ii) It can be quite useful as an alternative to a mouse or keyboard for navigating a Graphical User Interface (GUI).
(iii) Touch screens are used on a wide variety of devices such as computers, laptops, monitors, smart phones, tablets, cash registers, and information kiosks.
(iv) Some touch screens use a grid of infrared beams to sense the presence of a finger instead of utilizing touch-sensitive input.

10. Define POST.

Ans.
(i) POST (Power-On Self-Test) is the diagnostic testing sequence that a computer's basic input/output system runs to determine if the computer keyboard, random access memory, disk drives and other hardware are working correctly.
(ii) If the necessary hardware is detected and found to be operating properly, the computer begins to boot.

LONG ANSWERS 5 MARKS

1. Explain any two input and output devices.

Ans. **Input Devices :**

(i) **Scanner:** Scanners are used to enter the information directly into the computer's memory. This device works like a xerox machine. The scanner converts any type of printed or written information including photographs into a digital format, which can be manipulated by the computer.

(ii) **Finger print Scanner:** Finger print Scanner is a fingerprint recognition device used for computer security, equipped with the fingerprint recognition feature that uses biometric technology. Fingerprint Reader / Scanner is a very safe and convenient device for security instead of using passwords, which is vulnerable to fraud and is hard to remember.

Output Devices :

(i) **Monitor:** Monitor is the most commonly used output device to display the information. It looks like a TV. Monitors may either be Monochrome which display text or images in Black and White or can be color, which display results in multiple colors. There are many types of monitors available such as CRT (Cathode Ray Tube), LCD (Liquid Crystal Display) and LED (Light Emitting Diodes). The video graphics card helps the keyboard to communicate with the screen. It acts as an interface between the computer and display monitor.

(ii) **Plotter:** Plotter is an output device that is used to produce graphical output on papers. It uses single color or multi color pens to draw pictures.

2. Explain in detail the different types of Mouse.

Ans. (i) **Mechanical Mouse :**

A small ball is kept inside and touches the pad through a hole at the bottom of the mouse. When the mouse is moved, the ball rolls. This movement of the ball is converted into signals and sent to the computer.

(ii) **Optical Mouse:**

Measures the motion and acceleration of pointer. It uses light source instead of ball to judge the motion of the pointer.Optical mouse has three buttons. Optical mouse is less sensitive towards surface.

(iii) **Laser Mouse:**

Measures the motion and acceleration of pointer. Laser Mouse uses Laser Light. Laser Mouse is highly sensitive and able to work on any hard surface.

3. Explain Impact Printers with an Example.

Ans. **Impact Printers :**

(i) These printers print with striking of hammers or pins on ribbon. These printers can print on multi-part (using carbon papers) by using mechanical pressure.

(ii) **For example,** Dot Matrix printers and Line matrix printers are impact printers.

(iii) A Dot matrix printer that prints using a fixed number of pins or wires. Each dot is produced by a tiny metal rod, also called a "wire" or "pin", which works by the power of a tiny electromagnet or solenoid, either directly or through a set of small levers.

(iv) It generally prints one line of text at a time. The printing speed of these printers varies from 30 to 1550 CPS (Character Per Second).

4. Explain Non-Impact printers with an examples.

Ans. **Non-Impact Printers :**

(i) These printers do not use striking mechanism for printing. They use electrostatic or laser technology.

(ii) Quality and speed of these printers are better than Impact printers. **For example,** Laser printers and Inkjet printers are non-impact printers.

Laser Printers :

(i) Laser printers mostly work with similar technology used by photocopiers.

(ii) It makes a laser beam scan back and forth across a drum inside the printer, building up a pattern. It can produce very good quality of graphic images.

Inkjet Printers:

(i) Inkjet Printers use colour cartridges which combined Magenta, Yellow and Cyan inks to create color tones.

(ii) A black cartridge is also used for monochrome output. Inkjet printers work by spraying ionised ink at a sheet of paper.

(iii) They use the technology of firing ink by heating it so that it explodes towards the paper in bubbles or by using piezoelectricity in which tiny electric currents controlled by electronic circuits are used inside the printer to spread ink in jet speed.

(iv) An Inkjet printer can spread millions of dots of ink at the paper every single second.

☆ ☆ ☆

WORKSHOP

1. Identify the number system for the following numbers.

Ans.

S.No	NUMBER	NUMBER SYSTEM
1.	$(1010)_{10}$	Decimal Number system
2.	$(1010)_2$	Binary Number System
3.	$(989)_{16}$	Hexadecimal Number System
4.	$(750)_8$	Octal Number System
5.	$(926)_{10}$	Decimal Number System

2. State whether the following numbers are valid or not. If invalid, give reason.

Ans.

S.No	STATEMENT	YES / NO	REASON (IF INVALID)
1.	786 is an Octal number	No	In. octal number, the allowable digits is between 0 and 7
2.	101 is a Binary number	No	No Radix is mentional
3.	Radix of Octal number is 7	No	Radix of octal number is 8

3. Convert the following Decimal numbers to its equivalent Binary, Octal, Hexadecimal.

1) 1920 2) 255 3) 126

Ans. **1)** $1920_{10} = ?_2$

2	1920
2	960 – 0
2	480 – 0
2	240 – 0
2	120 – 0
2	60 – 0
2	30 – 0
2	15 – 0
2	7 – 1
2	3 – 1
	1 – 1

$1920_{10} = 11110000000_2$

$1920_{10} = ?_8$

8	1920
8	240 – 0
8	30 – 0
	3 – 6

$1920 = 3600_8$ *[Mar. 2019]*

16	1920
16	120 – 0
	7 – 8

$= 1920_{10} = 780_{16}$

2) 255_{10} *[Mar. 2019]*

2	255
2	127 – 1
2	63 – 1
2	31 – 1
2	15 – 1
2	7 – 1
2	3 – 1
2	1 – 1

$255_{10} = 11111111_2$

$255_{10} = ?_8$

8	255
8	31 – 7
	3 – 7

$255_{10} = 377_8$

$255_{10} = ?_{16}$

16	255
	15 – 15

15 – F

$255_{10} = FF_{16}$

3) 126_{10}

2	126	
2	63	– 0
2	31	– 1
2	15	– 1
2	7	– 1
2	3	– 1
	1	– 1

$126_{10} = 1111110_2$

$126_{10} = ?_8$

8	126	
8	15	– 6
	1	– 7

$126_{10} = 176_8$

$126_{10} = ?_{16}$

16	126	
	7	– 14
	14	– E

$126_{10} = 7E_{16}$

4. Convert the given Binary number into its equivalent Decimal, Octal and Hexadecimal number.

1) 101110101 2) 1011010 3) 101011111

Ans. **1) 101110101**

Decimal Equivalent :

$= 1 \times 2^8 + \cancel{0 \times 2^7} + 1 \times 2^6 + 1 \times 2^5 + 1 \times 2^4 + \cancel{0 \times 2^3} + 1 \times 2^2 + \cancel{0 \times 2^1} + 1 \times 2^0$

$= 256 + 64 + 32 + 16 + 4 + 1 = 373_{10}$

Octal Equivalent :

$= \overline{101}\ \overline{110}\ \overline{101}$ → 5 6 5

$= 565_8$

Hexadecimal Equivalent :

$= \overline{10}\ \overline{1110}\ \overline{101}$ → 1 7 5

$= 175_{16}$; $10110101_2 = 373_{10} = 565_8 = 175_{16}$

2) 1011010_2

Decimal Equivalent :

$= 1 \times 2^6 + \cancel{0 \times 2^5} + 1 \times 2^4 + 1 \times 2^3 + \cancel{0 \times 2^2} + 1 \times 2^1 + \cancel{0 \times 2^0}$

$= 64 + 16 + 8 + 2 = 90_{10}$

Octal Equivalent :

$= \overline{10}\ \overline{110}\ \overline{110}$ → 1 3 2

$= 132_8$

Hexadecimal Equivalent :

$= \overline{101}\ \overline{1010}$ → 5 10 → 5 A

$= 54_{16}$

$1011010_2 = 90_{10} = 132_8 = 5A_{16}$

3) 101011111

Decimal Equivalent :

$= 1 \times 2^8 + \cancel{0 \times 2^7} + 1 \times 2^6 + \cancel{0 \times 2^5} + 1 \times 2^4 + 1 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 1 \times 2^0$

$= 256 + 64 + 16 + 8 + 4 + 2 + 1 = 351_{10}$

Octal Equivalent :

$= \overline{101}\ \overline{011}\ \overline{111}$ → 5 3 7

$= 537_8$

Hexadecimal Equivalent :

$= \overline{10}\ \overline{101}\ \overline{1111}$ → 1 5 15 → 1 5 F

$= 15F_{16}$

$101011111_2 = 351_{10} = 537_8 = 15F_{16}$

5. **Convert the following Octal numbers into Binary numbers. (A) 472 (B) 145 (C) 347 (D) 6247 (E) 645** *[Sep. 2020]*

Ans. **A) 472_8**

4 7 2
↓ ↓ ↓
100 111 010

2 | 4 → 2 – 0 → 1 – 0
2 | 7 → 3 – 1 → 1 – 1
2 | 2 → 1 – 0

$472_8 = 100111010_2$

(B) 145

1 4 5
↓ ↓ ↓
1 100 101

2 | 4 → 2 – 0 → 1 – 0
2 | 5 → 2 – 1 → 1 – 0

$145_8 = 1100101_2$

(C) 347_8

3 4 7
↓ ↓ ↓
11 100 111

2 | 3 → 1 – 1
2 | 4 → 2 – 0 → 1 – 0
2 | 7 → 3 – 1 → 1 – 1

$347_8 = 11100111_2$

(D) 6247_8

6 2 4 7
↓ ↓ ↓ ↓
110 010 100 111

2 | 6 → 3 – 0 → 1 – 1

$6247_8 = 110010100111_2$

(E) 645_8

6 4 5
↓ ↓ ↓
110 100 101

$645_8 = 110100101_2$

6. **Convert the following Hexadecimal numbers to Binary numbers (A) A6 (B) BE (C) 9BC8 (D) BC9**

Ans. **(A) $A6_{16}$**

A 6
↓ ↓
10 6
↓ ↓
1010 0110

A= 10

$A6_{16} = 10100110_2$

(B) BE_{16}

B E
↓ ↓
11 14
↓ ↓
1010 1110

B = 11 ; E = 14

$BE_{16} = 10111110_2$

(C) $9BC8_{16}$

9 B C 8
↓ ↓ ↓ ↓
9 11 12 8
↓ ↓ ↓ ↓
1001 1011 1100 1000

$9BC8_{16} = 1001101111001000_2$

D) $BC9_{16}$

B C 9
↓ ↓ ↓
11 12 9
↓ ↓ ↓
1011 1100 1001

$BC9_{16} = 101111001001_2$

7. **Write the 1's complement number and 2's complement number for the following decimal numbers: (A) 22 (B) –13 (C) –65 (D) – 46** *[Sep. 2020]*

Ans. **(A) 22**

2 | 22
2 | 11 – 0
2 | 5 – 1
2 | 2 – 1
1 – 0

Binary equivalent of + 22 = 10110
8 bit format = 00010110

PART - II - BOOLEAN ALGEBRA

EVALUATION

SECTION - A

CHOOSE THE CORRECT ANSWER:

1. Which is a basic electronic circuit which operates on one or more signals?

(a) Boolean algebra (b) Gate
(c) Fundamental gates (d) Derived gates

[Ans. (b) Gate]

2. Which gate is called as the logical inverter?

(a) AND (b) OR *[Mar. 2019 & 2020]*
(c) NOT (d) XNOR

[Ans. (c) NOT]

3. A + A = ?

(a) A (b) O
(c) I (d) A **[Ans. (a) A]**

4. NOR is a combination of? *[FMT 2018]*

(a) NOT(OR) (b) NOT(AND)
(c) NOT(NOT) (d) NOT(NOR)

[Ans. (a) NOT(OR)]

5. NAND is called as …… Gate

(a) Fundamental Gate (b) Derived Gate
(c) Logical Gate (d) Universal gate

[Ans. (d) Universal gate]

SECTION - B

VERY SHORT ANSWERS

1. What is Boolean Algebra?

Ans. Boolean algebra is a mathematical discipline that is used for designing digital circuits in a digital computer. It describes the relation between inputs and outputs of a digital circuit. **Example:** X = A +B.

2. Write a short note on NAND Gate.

Ans. **(i)** The NAND gate operates an AND gate followed by a NOT gate.

(ii) It acts in the manner of the logical operation "AND" followed by inversion. The output is "false" if both inputs are "true", otherwise, the output is "true".

3. Draw the truth table for XOR gate.

Ans. The truth table for XOR gate is

Input		Output
A	B	C
0	0	0
0	1	1
1	0	1
1	1	0

4. Write the associative laws.

Ans. Associative

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

$A . (B . C) = (A . B) . C$

5. What are derived gates? *[June 2019]*

Ans. NAND, NOR, XOR and XNOR are derived gates which are derived from the fundamental logical gates.

SECTION - C

SHORT ANSWERS

1. Write the truth table of fundamental gates.

Ans. The fundamental gates are AND, OR, NOT gates

(i) AND Gate Truth Table : *[Mar. 2020]*

A	B	A.B
0	0	0
0	1	0
1	0	0
1	1	1

(ii) OR Gate Truth Table :

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

(iii) NOT Gate Truth Table :

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

2. Write a short note on XNOR gate.

Ans. The XNOR (exclusive - NOR) gate is a combination XOR gate followed by an inverter. Its output is "true" if the inputs are the same, and "false" if the inputs are different. In simple words, the output is 1 if the input are the same, otherwise the output is 0.

The truth table for XNOR Gate is

Input		Output
A	B	C
0	0	1
0	1	0
1	0	0
1	1	1

3. Reason out why the NAND an NOR are called universal gates?

Ans. NAND and NOR gates are called Universal gates, because the fundamental logic gates can be realized through them.

4. Give the truth table of XOR gate.

Ans.

A	B	A⊕B
0	0	0
0	1	1
1	0	1
1	1	0

5. Write the De Morgan's law.

Ans. De Morgan's

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

$\overline{(A \cdot B)} = \bar{A} + \bar{B}$

SECTION - D

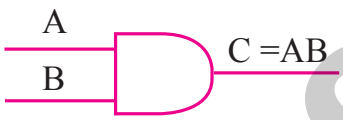
EXPLAIN IN DETAIL

1. Explain the fundamental gates with expression and truth table. *[FMT; QY. 2018]*

Ans. A gate is basic electronic circuit which operates on one or more signals to produce an output signal. There are three fundamental gates namely AND, OR and NOT.

AND Gate :

The AND gate can have two or more input signals and produce an output signal. In boolean algebra, a variable can take either of the values '0' or '1'. The logical symbol of the AND gate is AND gate is



Logic symbol of AND Gate

In boolean algebra the multiplication sign stands for the AND operation. Therefore, the output of the AND gate is

$C = A \cdot B$ or

simply $C = AB$

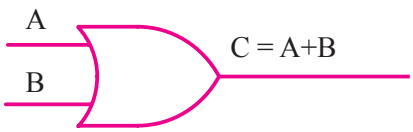
The truth table for AND Gate is

Input		Output
A	B	C
0	0	0
0	1	0
1	0	0
1	1	1

The truth table for AND Gate

OR Gate :

The OR gate gets its name from the face that it behaves like the logical inclusive "OR". The output is "true" if either or both of the inputs are "true". If both inputs are "false" then the output is "false". In otherwords the output will be 1 if and only if one or both inputs are 1; otherwise, the output is 0. The logical symbol of the OR gate is



Logic symbol of OR Gate

The OR gate output is

$C = A \text{ OR } B$

We use the + sign to denote the OR function. Therefore,

$C = A + B$

CHAPTER 3 COMPUTER ORGANIZATION

CHAPTER SNAPSHOT

EVALUATION

SECTION - A

CHOOSE THE CORRECT ANSWER

1. Which of the following is said to be the brain of a computer? *[CRT '22]*

(a) Input devices (b) Output devices
(c) Memory device (d) Microprocessor

[Ans. (d) Microprocessor]

2. Which of the following is not the part of a microprocessor unit? *[May ' 22]*

(a) ALU (b) Control unit
(c) Cache memory (d) register

[Ans. (c) Cache memory]

3. How many bits constitute a word?

(a) 8 (b) 16 (c) 32
(d) determined by the processor used.

[Ans. (d) determined by the processor used]

4. Which of the following device identifies the location when address is placed in the memory address register?

(a) locator (b) encoder
(c) decoder (d) multiplexer

[Ans. (c) decoder]

5. Which of the following is a CISC processor? *[QY. 2018; Sep. 2021]*

(a) Intel P6 (b) AMD K6
(c) Pentium III (d) Pentium IV

[Ans. (c) Pentium III]

6. Which is the fastest memory? *[FMT 2018; Aug '22]*

(a) Hard disk (b) Main memory
(c) Cache memory (d) Blue-Ray disc

[Ans. (c) Cache memory]

7. How many memory locations are identified by a processor with 8 bits address bus at a time?

(a) 28 (b) 1024
(c) 256 (d) 8000 **[Ans. (c) 256]**

8. What is the capacity of 12cm diameter DVD with single sided and single layer?

(a) 4.7 GB (b) 5.5 GB
(c) 7.8 GB (d) 2.2 GB

[Ans. (a) 4.7 GB]

9. What is the smallest size of data represented in a CD?

(a) blocks (b) sectors
(c) pits (d) tracks **[Ans. (c) pits]**

10. Display devices are connected to the computer through

(a) USB port
(b) Ps/2 port
(c) SCSI port
(d) VGA connector **[Ans. (d) VGA connector]**

SECTION - B

VERY SHORT ANSWERS

1. What are the parameters which influence the characteristics of a microprocessor?

Ans. A Microprocessor's performance depends on the following characteristics:

(i) Clock speed
(ii) Instruction set
(iii) Word size

2. What is an instruction?

Ans. A command which is given to a computer to perform an operation on data is called an instruction.

3. What is a program counter? *[Mar. 2019]*

Ans. The Program Counter (PC) is a special register in the CPU which always keeps the address of the next instruction to be executed.

4. What is HDMI? *[FMT 2018; HY. 2019 ; Sep. 2020]*

Ans. High-Definition Multimedia Interface is an audio/video interface which transfers the uncompressed video and audio data from a video controller, to a compatible computer monitor, LCD projector, digital television etc.

5. Which source is used to erase the content of a EPROM?

Ans. Ultra-violet-rays is used to erase the content of a EPROM.

SECTION - C

SHORT ANSWERS

1. Differentiate Computer Organization from Computer Architecture.

Ans.

(i) Computer Organization deals with the hardware components that are transparent to the programmer.

(ii) Computer architecture deals with the engineering considerations involved in designing a computer.

2. Classify the microprocessor based on the size of the data. *[CRT '22]*

Ans. Microprocessors can process instructions. The microprocessors can be classified as follows based on the size of the data.

(i) 8-bit microprocessor

(ii) 16-bit microprocessor

(iii) 32-bit microprocessor

(iv) 64-bit microprocessor

3. Write down the classifications of microprocessors based on the instruction set.

Ans. The two types of microprocessors wich are based on their instruction sets.

(i) Reduced Instruction Set Computers (RISC)

(ii) Complex Instruction Set Computers (CISC)

4. Differentiate PROM and EPROM.

Ans.

	PROM	EPROM
(i)	Programmable Read only memory.	Erasable Programmable Read only memory.
(ii)	It is also a non-volatile memory on which data can be written only once.	It is also a nono-volatile memory and a special type of memory.
(iii)	PROM burner is used to write data to a PROM chip.	EPROM serves as a PROM, but the content can be erased using ultraviolet rays

5. Write down the interfaces and ports available in a computer. *[HY. 2019 ; Sep. 2020]*

Ans.

(i) Serial Port

(ii) Parallel Port

(iii) USB 3.0

(iv) VGA Connector

(v) Audio Plugs

(vi) PS/2 Port

(vii) SCSI Port

(viii) High Definition Multimedia Interface(HDMI).

6. Differentiate CD and DVD. *[FMT 2018; June 2019; Mar. 2020]*

Ans.

	CD	DVD
(i)	Expansion is Compact-Disk	Expansion is Digital Versatile Disc.
(ii)	A standard CD can store about 700 MB of Data.	A standard DVD can hold 4.7 GB of data.
(iii)	CD players cannot play DVDs.	DVD players can play CDs.
(iv)	It stores upto 80 min of audio.	It can range from 4.7 GB to 17.08 GB.

7. How will you differentiate a flash memory and an EEPROM?

Ans. **Flash memory devices:**

(i) Flash memory is an electronic (solid-state) non-volatile computer storage medium that can be electrically erased and reprogrammed.

(ii) Flash memories can be used in personal computers, Personal Digital Assistants (PDA), digital audio players, digital cameras and mobile phones.

(iii) Flash memory offers fast access times. The time taken to read or write a character in memory is called access time.

(iv) Examples for Flash memories are pen drives, memory cards etc.

EEPROM:

(i) Electrically Erasable Programmable Read Only Memory can be erased by exposing it to an electrical charge.

(ii) EEPROM is non-volatile.

(iii) EEPROM is slower in performance.

SECTION - D

EXPLAIN IN DETAIL

1. Explain the characteristics of a microprocessor.

[FMT; HY. 2018; June 2019; HY. 2019; CRT & Aug '22]

Ans. A Microprocessor's performance depends on the following characteristics:

(i) Clock speed
(ii) Instruction set
(iii) Word size

(i) Clock Speed *[Govt.MQP-2018; QY. 2019]*

Every microprocessor has an internal clock that regulates the speed at which it executes instructions. The speed at which the microprocessor executes instructions is called clock speed. Clock speed is measured in MHz (Mega Hertz) or in GHz (Giga Hertz).

(ii) Instruction set : A command which is given to a computer to perform an operation on data is called an instruction. Basic set of machine level instructions that a microprocessor is designed to execute is called as an instruction set. This instruction set carries out the following types of operations:

1. Data transfer
2. Arithmetic operations
3. Logical operations
4. Control flow
5. Input/output.

(iii) Word Size : *[Govt.MQP-2018]*

The number of bits that can be processed by a processor in a single instruction is called its word size. Word size determines the amount of RAM that can be accessed by a microprocessor at one time and the total number of pins on the microprocessor. Total number of input and output pins in turn determines the architecture of the microprocessor.

2. How the read and write operations are performed by a processor? Explain.

Ans. **(i)** The Central Processing Unit(CPU) has a Memory Data Register (MDR) and a Memory Address Register (MAR).

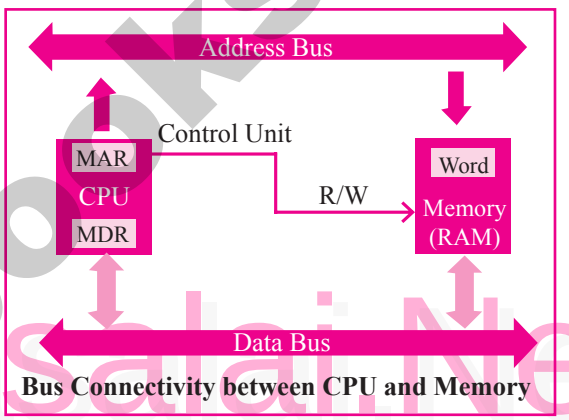
(ii) The Memory Data Register (MDR) keeps the data which is transferred between the Memory and the CPU. The Program Counter (PC) is a special register in the CPU which always keeps the address of the next instruction to be executed.

(iii) A bus is a collection of wires used for communication between the internal components of a computer.

(iv) The address bus is used to point a memory location. A decoder, a digital circuit is used to point to the specific memory location where the word can be located.

(v) The read operation fetches data from memory and transfers to MDR. A single control line performs two operations like read write using 1or 0.

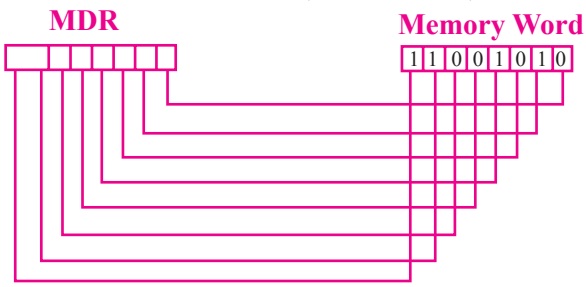
(vi) Also, the write operation transfers data from the MDR to memory.



Bus Connectivity between CPU and Memory

(vii) The word in the RAM has the same size (no. of bits) as the Memory Data Register (MDR).

(viii) The data bus has eight parallel wires to transfer data either from MDR to word or word to MDR based on the control(Read or write).



Before the read operation

(ix) This control line is labeled as R/W, which becomes 1 means READ operation and 0 means WRITE operation. The content of MDR and the Word before the READ operation. Also figure shows the content of MDR and the Word after the READ operation.

GOVERNMENT EXAM QUESTIONS AND ANSWERS

1 MARK

1. Match the following *[Govt.MQP-2018]*

	List I		List II
(i)	CD ROM	1	4.7 GB
(ii)	DVD	2	2. 50 GB
(iii)	Flash memory	3	3.700 MB
(iv)	Blu ray disc	4	4. 2 TB

Codes:

	(i)	(ii)	(iii)	(iv)
(a)	4	1	3	2
(b)	3	1	4	2
(c)	3	4	1	2
(d)	4	3	1	2

[Ans. (b) (i)-3, (ii)-1, (iii)-4, (iv)-2]

2. CD data is represented as tiny indentations known as ..... . *[QY. 2018]*

(a) Bits (b) Lands
(c) Pits (d) Bytes **[Ans. (c) Pits]**

3. --------- port helps to connect keyboard and mouse *[FMT 2018]*

(a) SCSI (b) SERIAL
(c) PS/2 (d) Parallel **[Ans. (c) PS/2]**

4. Pick the RISC processor: *[June 2019]*

(a) Intel P6 (b) Intel 386 & 486
(c) Pentium II (d) Motorola 68000
[Ans. (a) Intel P6]

5. Blue Ray disc can store upto _____ GD of Data. *[QY. 2019]*

(a) 50 (b) 6.4 (c) 6.2 (d) 70
[Ans. (a) 50]

6. To connect mouse and keyboard to PC _____ is used *[QY. 2019]*

(a) VGA (b) SCSI (c) PS/2 (d) HOMI
[Ans. (c) PS/2]

7. Which is collection of wires used for communication between the internal components of a computer? *[QY. 2018]*

(a) Program counter (b) BUS
(c) Word size
(d) Central Processing Unit **[Ans. (b) BUS]**

8. Which is used to connect a monitor or any display device like LCD projector to a computer? *[Mar. 2019]*

(a) SCSI port (b) VGA connector
(c) USB port (d) PS/2 port
[Ans. (b) VGA connector]

9. _____ is called as a non-volatile memory. *[CRT '22]*

(a) RAM (b) ROM
(c) Both (a) and (b) (d) None of these
[Ans. (b) ROM]

2 MARKS

1. What is MDR? *[Govt.MQP-2018]*

Ans. **(i)** Memory Data Register is the register of a computer's control unit that contains the data to be stored in the computer storage (Eg. RAM).
(ii) It is also called Memory Buffer Register.

2. Expand (i) RISC (ii) CISC (iii) USB and (iv) EEPROM. *[FMT 2018]*

Ans. **(i)** RISC - Reduced Instruction Set Computers
(ii) CISC - Complex Instruction Set Computers
(iii) USB - Universal Serial Bus
(iv) EEPROM - Electrically Erasable Programmable Read only Memory.

3. Define the types of RAM. *[QY. 2018; Aug '22]*

Ans. The two basic types of RAM
(i) Dynamic RAM (DRAM)
(ii) Static RAM (SRAM)
Dynamic RAM being a common type needs to be refreshed frequently.
Static RAM needs to be refreshed less often, which makes it faster. Static RAM is more expensive than Dynamic RAM.

4. Write notes on : DVD. *[QY. 2019]*

Ans. **Digital Versatile Disc (DVD):**
(i) A DVD (Digital Versatile Disc or Digital Video Disc) is an optical disc capable of storing up to 4.7 GB of data, more than six times what a CD can hold.
(ii) DVDs are often used to store movies at a better quality. Like CDs, DVDs are read with a laser. The disc can have one or two sides, and one or two layers of data per side; the number of sides and layers determines how much it can hold.
(iii) A 12 cm diameter disc with single sided, single layer has 4.7 GB capacity, whereas the single sided, double layer has 8.5 GB capacity.
(iv) Double-layered sides are usually gold-coloured, while single-layered sides are usually silver-coloured, like a CD.

5. What is instruction set? *[Aug '22]*

Ans. Basic set of machine level instructions that a microprocessor is designed to execute is called as an instruction set.

3 Marks

1. Differentiate the Memory: Cache and Flash *[QY. 2018]*

Ans.

	Cache Memory	Flash Memory
(i)	The cache memory is a very high speed and expensive memory, which is used to speed up the memory retrieval process.	Flash memory is an electronic non-volatile computer storage medium that can be electrically erased and reprogrammed.
(ii)	This helps to achieve the fast response time, where response time, refers to how quickly the memory can respond to a read/ write request.	Flash memory offers fast access times. The time taken to read or write a character in memory is called access time.

2. Write briefly about Blu-ray disc. *[Govt.MQP-2018]*

Ans.

(i) Blu-Ray Disc is a high-density optical disc similar to DVD. Blu-ray is the type of disc used for PlayStation games and for playing High-Definition (HD) movies.

(ii) A double-layer Blu-Ray disc can store up to 50GB (gigabytes) of data. This is more than 5 times the capacity of a DVD, and above 70 times of a CD.

(iii) Blu-Ray disc was developed to enable recording, rewriting and playback of high-definition video as well as storing large amount of data.

(iv) DVD uses a red laser to read and write data. But, Blu-ray uses a blue-violet laser to write. Hence, it is called as Blu-Ray.

5 Marks

1. Explain RAM in detail. *[QY. 2018]*

Ans.

(i) The main memory is otherwise called as Random Access Memory. This is available in computers in the form of Integrated Circuits (ICs). It is the place in a computer where the Operating System, Application Programs and the data in current use are kept temporarily so that they can be accessed by the computer's processor.

(ii) RAM is a volatile memory, which means that the information stored in it is not permanent. As soon as the power is turned off, whatever data that resides in RAM is lost. It allows both read and write operations.

(iii) There are two basic types of RAM
Dynamic RAM (DRAM), Static RAM (SRAM)

(iv) These two types differ in the technology they use to hold data. Dynamic RAM being a common type needs to be refreshed frequently. Static RAM needs to be refreshed less often, which makes it faster.

(v) Hence, Static RAM is more expensive than Dynamic RAM.

2. Explain RISC and CISC. *[QY. 2019]*

Ans. **RISC**

(i) RISC stands for Reduced Instruction Set Computers. They have a small set of highly optimized instructions.

(ii) Complex instructions are also implemented using simpler instructions, thus reducing the size of the instruction set.

(iii) Examples of RISC processors are Intel P6, Pentium IV, AMD K6 and K7.

CISC

(i) CISC stands for Complex Instruction Set Computers.

(ii) They support hundreds of instructions. Computers supporting CISC can accomplish a wide variety of tasks, making them ideal for personal computers.

(iii) Examples of CISC processors are Intel 386 & 486, Pentium, Pentium II and III, and Motorola 68000.

3. Explain the types of Microprocessors. *[Sep. 2021; May '22]*

Ans. Microprocessors can be classified based on the following criteria:

(i) The width of data that can be processed

(ii) The instruction set

(i) Classification of Microprocessors based on the Data Width:

Depending on the data width, microprocessors can be classified as follows:

(a) 8-bit microprocessor
(b) 16-bit microprocessor
(c) 32-bit microprocessor
(d) 64-bit microprocessor

Long Answers 5 MARKS

1. Explain the classification of Microprocessor based on Instruction set?

Ans. **(i)** The size of the instruction set is another important consideration while categorizing microprocessors. Initially, microprocessors had very small instruction sets because complex hardware was expensive as well as difficult to build.

(ii) As technology had developed to overcome these issues, more and more complex instructions were added to increase the functionality of microprocessors.

(iii) Reduced Instruction Set Computers (RISC): RISC stands for Reduced Instruction Set Computers. They have a small set of highly optimized instructions. Complex instructions are also implemented using simple instructions thus reducing the size of the instruction set.

Examples of RISC processors are Pentium IV, Intel P6, AMD K6 and K7.

(iv) Complex Instruction Set Computers (CISC): CISC stands for Complex Instruction Set Computers. They support hundreds of instructions. Computers supporting CISC can accomplish a wide variety of tasks, making them ideal for personal computers.

Examples of CISC processors are Intel 386 & 486, Pentium, Pentium II and III, and Motorola 68000.

2. Define the following.
(i) Bus (ii) Data bus
(iii) Address bus (iv) Control Bus

Ans. **(i) Bus :** A bus is a collection of wires used for communication between the internal components of a computer.

(ii) Data bus : Data bus is a collection of wires to carry data in bits. A data bus is used to transfer data between the memory and the CPU. The data bus is bidirectional.

(iii) Address bus : Address bus is a collection of wires to carry data in bits. The address bus is used to point a memory location. The address bus is unidirectional.

(iv) Control bus : Control bus is a control line, collection of wires to control the operation functions. The control bus controls both read and write operations.

3. Explain any two secondary storage devices.

Ans. **Hard disk :**

(i) Hard disk is a magnetic disk on which you can store data. The hard disk has the stacked arrangement of disks accessed by a pair of heads for each of the disks.

(ii) The hard disks come with a single or double sided disk.

Compact Disk (CD) :

(i) A CD or CD-ROM is made from 1.2 millimeters thick, polycarbonate plastic material. A thin layer of aluminum or gold is applied to the surface.

(ii) CD data is represented as tiny indentations known as "pits", encoded in a spiral track moulded into the top of the polycarbonate layer. The areas between pits are known as "lands".

(iii) A motor within the CD player rotates the disk. The capacity of an ordinary CD- ROM is 700MB.

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ADDITIONAL QUESTIONS AND ANSWERS

CHOOSE THE CORRECT ANSWERS 1 MARK

I. CHOOSE THE CORRECT OPTIONS FOR THE BELOW QUESTIONS.

1. Which one of the following is not a function of an operating system?
(a) Program Management
(b) Process Management
(c) Device Management
(d) Memory Management
[Ans. (a) Program Management]

2. Which is used to perform any computer operation?
(a) Application software
(b) Hardware
(c) Operating system
(d) File Management
[Ans. (c) Operating system]

3. Which of the following operating systems not used in laptops?
(a) Windows (b) Linux
(c) iOS (d) Unix [Ans. (c) iOS]

4. Which of the following operating system are not in mobile phones?
(a) Symbian (b) Linux
(c) Apple iOS (d) Google Android
[Ans. (b) Linux]

5. Which of the following is a concept of having more than one operating system on single PC?
(a) Multiuser (b) Multi tasking
(c) Multiprocessor (d) Virtual
[Ans. (d) Virtual]

6. On which operating system more than one tasks executed concurrently?
(a) Single-user (b) Time sharing
(c) Multi-user (d) Multiprocessing
[Ans. (b) Time sharing]

7. Which scheduling technique employed by time sharing OS?
(a) Spooling (b) LIFO
(c) FIFO (d) Round Robin
[Ans. (d) Round Robin]

8. Which of the following is not true about Timesharing OS?
(a) Provides the advantage of quick response
(b) Promotes duplication of software
(c) Reduces CPU idle time
(d) Problem of reliability
[Ans. (b) Promotes duplication of software]

9. In which operating system, given tasks done within a fixed timeline?
(a) Real time (b) Multi-tasking
(c) Multiprocessor (d) Online
[Ans. (a) Real time]

10. Which operating system is used to access shared data and files any machine around the world?
(a) Real time (b) Multiuser
(c) Multiprocessor (d) Distributed
[Ans. (d) Distributed]

11. In which operating system the user can exchange the data which each other in real time?
(a) Distributed (b) Real time
(c) Time sharing (d) Multi-user
[Ans. (a) Distributed]

12. Which operating system provides GUI?
(a) Distributed (b) Real time
(c) Interactive (d) Multi-User
[Ans. (c) Interactive]

13. How many functions are there in OS?
(a) 4 (b) 5 (c) 3 (d) 2
[Ans. (b) 5]

14. Which of the following management keeps track of the memory?
(a) Storage (b) Memory
(c) File (d) Process
[Ans. (b) Memory]

15. Which management is the process of managing the operations implementation, maintenance of physical and virtual devices?
(a) File (b) Process
(c) Memory (d) Device
[Ans. (d) Device]

16. How many techniques are there to optimize the CPU time?
(a) 4 (b) 5 (c) 2 (d) 3
[Ans. (c) 2]

17. Which device management technique used for processing of different tasks on the same I/O device?
(a) Buffering (b) Spooling
(c) Scheduling (d) allocation
[Ans. (b) Spooling]

18. Which of the following stored by FAT?
(a) File name (b) Access mode
(c) File type (d) All of these
[Ans. (d) All of these]

19. Which of the following are not stored by FAT?
(a) address (b) access mode
(c) NTFS (d) file size
[Ans. (c) NTFS]

20. Which OS developed by Google?
(a) Android (b) iOS
(c) Windows (d) Unix
[Ans. (a) Android]

21. Which OS created by Apple Inc?
(a) Android (b) Windows
(c) Unix (d) iOS [Ans. (d) iOS]

22. The iOS used in ..... .
(a) iPhone (b) iPad
(c) iPad Touch (d) all of these
[Ans. (d) all of these]

23. Which of the following is not Android OS?
(a) Cupcake (b) Eclair
(c) Five Star (d) Kitkat
[Ans. (c) Five Star]

24. Which of the OS not takes their roots from Unix?
(a) iOS (b) Linux
(c) Mac OS X (d) Windows
[Ans. (d) Windows]

25. Which OS is a windows-alternative open source?
(a) Android (b) iOS
(c) React OS (d) Mac OS X
[Ans. (c) React OS]

II. Match List I with List II and Select the Correct Answer using the Codes given below.

1.

	List I		List II
(i)	Virtual memory techniques are used	1	Single User OS
(ii)	MS-DOS	2	Time Sharing OS
(iii)	Linux, Unix	3	Multiprocessing OS
(iv)	Windows 7	4	Multi User OS

Codes:

	(i)	(ii)	(iii)	(iv)
(a)	2	1	4	3
(b)	1	3	2	4
(c)	4	3	1	2
(d)	3	4	1	2

[Ans. (a) (i)-2, (ii)-1, (iii)-4, (iv)-3]

2.

	List I		List II
(i)	Application software	1	Ms-Dos
(ii)	System software	2	windows
(iii)	Single user operating system	3	Language Processor
(iv)	Multiuser Operating System	4	Ms-word

Codes:

	(i)	(ii)	(iii)	(iv)
(a)	2	1	4	3
(b)	1	3	2	4
(c)	4	3	1	2
(d)	3	4	1	2

[Ans. (c) (i)-4, (ii)-3, (iii)-1, (iv)-2]

3.

	List I		List II
(i)	Virtual memory techniques are used	1	Real Time Os
(ii)	Windows 7	2	Multiuser Os
(iii)	Weather and climate prediction	3	Multiprocessing Os
(iv)	Linux, Unix	4	Time sharing Os

3. What is shareware?

Ans. It refers to the software which is made available with a right to redistribute copies.

4. Name any three Utility software.

Ans. Text editor, Anti virus programs, Compression Tools.

5. What is an Operating System?

Ans. An operating system is a system software which serves as the interface between a user and a computer.

6. What does function of Operating System includes?

Ans. The function of Operating system includes file management, memory management, process management and device management.

7. Name the operating system used in PCs and Mobile devices.

Ans. The operating systems used in personal computer and laptops are Windows, Unix and Linux. The mobile devices are using Android and iOS.

8. Why GUI is used in Windows?

Ans. GUI is used in Windows because it provides an interaction between the windows OS and the user.

9. Name any three OS which you are not known.

Ans. **(i)** BOSS **(ii)** Unix **(iii)** MS-DOS

10. Differentiate MS-Windows and MS-DOS.

Ans.

S.No	MS-Windows	MS-DOS
(i)	It is a GUI.	It is a CUI.
(ii)	It is a Multi-user multi-tasking OS.	It is a single-user multi-tasking OS.

11. Explain the need for an operating system.

Ans. Operating System was needed to enable the users to design the applications without the knowledge of the computer's internal structure and hardware system and also needs an interface to interact with the computer and controls the execution of all kinds of programs without knowing the internals of the hardware.

12. What do you mean by task in Single user OS? Give example.

Ans. A task is a function such as printing a document, writing a file to disk, editing a file or downloading a file etc. MS-DOS is an example for a single user and single task Operating System.

13. Give an example of Multi-user or Multi processor OS?

Ans. Windows, Linux, Unix.

14. Give any two advantages of UNIX.

Ans. **(i)** Full multitasking with protected memory.
(ii) Available on a wide variety of machines.

15. Write a note on Multi user operating system.

Ans. **(i)** It is used in computers and laptops that allow same data and applications to be accessed by multiple users at the same time.
(ii) The users can also communicate with each other. Windows, Linux and UNIX are examples for multi user Operating System.

16. Which situation in RTOS "Deadline Overrun"?

Ans. The system performance is good if the given task is finished within this timeline. If it is not done, the situation is called "Deadline Overrun".

17. Name the types of Digital Network.

Ans. **(i)** Internet
(ii) Intranet

18. What is Intranet and Internet?

Ans. **(i)** Intranet is a network of computers designed for a specific group of users.
(ii) Internet is wide network of computers and is open to all.

19. Name few applications of Distributed OS.

Ans. **(i)** Bank Teller Machine
(ii) Airline Reservation
(iii) Ticket Purchasing

20. How the communication takes place using Distributed OS?

Ans. The Processors with jobs communicate with each other through various communication channels (telephone lines or fibre optic cable or highspeed buses) and the processed results are later compiled together on a central computer.

21. What is Interactive Operating system?

Ans. It is a Graphical User Interface through which the user can easily navigate and interact with the system. It is more user friendly OS.

22. What is user Interface?

Ans. It is a part of OS which is visible to the user and has to be understood by the user.

23. Write any two activities of OS in regard to processor Management.

Ans. **(i)** A mechanism for dead long handling.
(ii) A mechanism for process synchronization.

24. What is process Management?

Ans. It is the important part of an OS which enables the activities of planning, monitoring and performance of a process.

25. What is the major drawback of priority scheduling?

Ans. The major drawback of priority scheduling is that even a small job has to wait for a long time when a long duration job with higher priority is being executed.

26. Write any two activities handled by an OS to regard to memory activities.

Ans. **(i)** Keeps track of memory
(ii) Allocates and de-allocates the memory when the process request in and process terminated.

27. What do you mean by segments in memory management?

Ans. Segments are areas of memory that usually correspond to a logical grouping of information such as a code procedure or a data array.

28. What are called page frames in paged memory management?

Ans. Paged allocation divides the computer's primary memory into fixed-size units called page frames.

29. What is Storage Management?

Ans. Storage Management creates various methods, tables and trees to store data efficiently, so the user won't have to mention addresses as to where to store data.

30. What is Device Management?

Ans. Device management is the process of managing the operation, implementation, maintenance of physical and virtual devices.

31. Write the answer for the following.
(i) Protects unauthorized user access of a system.
(ii) Helps to monitoring system performance.

Ans. **(i)** Security Management
(ii) Control over system performance

32. What are the two modes in which operating systems are available?

Ans. Operating systems are available in two modes they are called open source GNU license and commercial License (Closed group).

33. Write any two advantages of using Linux.

Ans. **(i)** It is open source OS
(ii) It can be modified and distributed by anyone.
(iii) It is easy to customize.
(iv) There are many distributors.

34. Name the distributors of Linux.

Ans. The distributors are
(i) BOSS **(ii)** Ubuntu
(iii) Mint **(iv)** Fedora
(v) Redhat **(vi)** Debian
(vii) Google's Android
(viii) Chrome OS and Chromium OS

35. What is React OS?

Ans. React OS is a Windows-alternative open source operating system, which is being developed on the principles of Windows-without using any of Microsoft's code.

36. Name the common devices which includes Google's Android OS.

Ans. **(i)** Tablets
(ii) Phones
(iii) Laptops

37. What is a mobile OS?

Ans. A mobile OS controls a mobile device and its design supports wireless communication and different types of mobile applications.

38. Give an example of mobile OS.

Ans. **(i)** Apple iOS **(ii)** Google Android
(iii) Blackberry **(iv)** Symbian

39. Name the OS which takes roots from Unix.

Ans. **(i)** Android
(ii) Linux
(iii) iOS
(iv) Mac OS X

40. Write any four latest android OS.

Ans. **(i)** Oreo
(ii) Marshmallow
(iii) Nougat
(iv) Kitkat

18. What is protected by the security modules of an OS?

Ans. The security modules of an Operating System protect the resources and information of a computer system against destruction and unauthorized user access. It is a process of ensuring OS integrity, confidentiality and availability.

LONG ANSWERS 5 MARKS

1. Explain memory management techniques.

Ans. **Memory Management :**

(i) Memory Management is the process of controlling and coordinating computer's main memory and assigning memory block (space) to various running programs to optimize overall computer performance.

(ii) The Memory management involves the allocation of specific memory blocks to individual programs based on user demands. At the application level, memory management ensures the availability of adequate memory for each running program at all times.

(iii) The objective of Memory Management process is to improve both the utilization of the CPU and the speed of the computer's response to its users via main memory. For these reasons the computers must keep several programs in main memory that associates with many different Memory Management schemes.

(iv) The Operating System is responsible for the following activities in connection with memory management:
Keeping track of which portion of memory are currently being used and who is using them.

(v) Determining which processes (or parts of processes) and data to move in and out of memory.

(vi) Allocation and de-allocation of memory blocks as needed by the program in main memory. (Garbage Collection).

2. Explain File Management.

Ans. **(i)** File management is an important function of OS which handles the data storage techniques. The operating System manages the files, folders and directory systems on a computer.

(ii) The FAT (File Allocation Table) stores general information about files like filename, type (text or binary), size, starting address and access mode.

(iii) The file manager of the operating system helps to create, edit, copy, allocate memory to the files and also updates the FAT.

(iv) There are few other file management techniques available like Next Generation File System (NTFS) and ext2(Linux).

3. Answer the following.

(a) Which Class of software the OS belongs?
(b) What is the need of OS?
(c) Why OS is important?
(d) Name any three types of Operating systems.
(e) Name any three functions of OS.

Ans. **(a)** System Software

(b) Provide a platform to run application programs and activate the basic level hardware.

(c) Act as an interface between user, software and hardware.

(d) 1. Real Time OS
2. BOSS
3. Interactive OS

(e) 1. Process Management
2. Storage Management
3. Device Management.

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UNIT- II ALGORITHMIC PROBLEM SOLVING

CHAPTER 6 SPECIFICATION AND ABSTRACTION

CHAPTER SNAPSHOT

EVALUATION

SECTION - A

CHOOSE THE CORRECT ANSWER

1. Which of the following activities is algorithmic in nature?

(a) Assemble a bicycle
(b) Describe a bicycle
(c) Label the parts of a bicycle
(d) Explain how a bicycle works

[Ans. (a) Assemble a bicycle]

2. Which of the following activities is not algorithmic in nature?

(a) Multiply two numbers
(b) Draw a kolam
(c) Walk in the park
(d) Swaping of two numbers

[Ans. (d) Swaping of two numbers]

3. Omitting details inessential to the task and representing only the essential features of the task is known as

(a) specification (b) abstraction
(c) composition (d) decomposition

[Ans. (b) abstraction]

4. Stating the input property and the input - output relation a problem is known *[Sep. 2021]*

(a) specification (b) statement
(c) algorithm (d) definition

[Ans. (a) specification]

5. Ensuring the input-output relation is

(a) the responsibility of the algorithm and the right of the user.
(b) the responsibility of the user and the right of the algorithm.
(c) the responsibility of the algorithm but not the right of the user.
(d) the responsibility of both the user and the algorithm.

[Ans. (d) the responsibility of both the user and the algorithm.]

6. If i = 5 before the assignment i := i-1 after the assignment, the value of i is

(a) 5 (b) 4 (c) 3 (d) 2

[Ans. (b) 4]

7. If 0 < i before the assignment i := i-1 after the assignment, we can conclude that *[QY. 2018]*

(a) 0 < i (b) 0 ≤ i (c) i = 0 (d) 0 ≥ i

[Ans. (b) 0 ≤ i]

SECTION - B

VERY SHORT ANSWERS

1. Define an algorithm. *[May '22]*

Ans. An algorithm is a sequence of instructions to accomplish a task or solve a problem.

2. Distinguish between an algorithm and a process.

[Govt.MQP-2018]

Ans.

S.No	Algorithm	Process
(i)	An algorithm is a step-by-step sequence of statements to solve a problem.	An instruction describes an action.
(ii)	As an algorithm is executed, a process evolves which solves the problem.	When the instructions are executed, a process evolves which accomplishes the intended task or solves the given problem.

3. Initially,

farmer, goat, grass, wolf = L, L, L, L and the farmer crosses the river with goat. Model the action with an assignment statement.

Ans.

(i) -- farmer, goat, grass, wolf = L, L, L, L
(ii) farmer, goat := R, R
(iii) -- farmer , goat , grass , wolf = R, R, L, L
(iv) farmer := L
(v) farmer, goat, grass, wolf = L, R, L, L
(vi) farmer, grass := R, R
(vii) -- farmer , goat , grass , wolf = R, R, R, L
(viii) farmer, goat := L, L
(ix) -- farmer, goat, grass, wolf = L, L, R, L
(x) farmer, wolf := R, R
(xi) -- farmer , goat , grass , wolf = R, L, R, R
(xii) farmer : = L
(xiii) -- farmer , goat , grass , wolf = L, L, R, R
(xiv) farmer , goat : = R, R
(xv) - farmer , goat , grass , wolf = R, R, R, R

4. Specify a function to find the minimum of two numbers.

Ans.

(i) Minimum (A, B)
(ii) -- inputs : A an B are integers or real numbers.
(iii) -- outputs : A is minimum, (A < B)
B is minimum, (B < A)

5. If $\sqrt{2}$ = 1.414, and the square_root() function returns -1.414, does it violate the following specification?

-- square_root (x)
-- inputs: x is a real number , x ≥ 0
-- outputs: y is a real number such that $y^2 = X$

Ans. Yes, it violate the specification.

SECTION - C

SHORT ANSWERS

1. When do you say that a problem is algorithmic in nature?

Ans. We usually say that a problem is algorithmic in nature when its solution involves the construction of an algorithm. Some types of problems can be immediately recognized as algorithmic.

2. What is the format of the specification of an algorithm?

Ans. Let P be the required property of the inputs and Q the property of the desired outputs. Then the algorithm S is specified as

1. algorithm_name (inputs)
2. -- inputs : P
3. -- outputs: Q

3. What is abstraction? *[HY. 2018; QY. 2019; CRT '22]*

Ans. A problem can involve a lot of details. Several of these details are unnecessary for solving the problem. Only a few details are essential. Ignoring or hiding unnecessary details and modeling an entity only by its essential properties is known as abstraction.

4. How is state represented in algorithms?

Ans.

(i) State is a basic and important abstraction.
(ii) Computational processes have state. A computational process starts with an initial state. As actions are performed, its state changes. Its ends with a final state.
(iii) The state at any point of execution is simply the values of the variables at that point.

5. What is the form and meaning of assignment statement?

Ans. Assignment statement is used to store a value in a variable. It is written with the variable on the left side of the assignment operator and a value on the right side.

Format / Form :

variable := value

Example : m : = 2

When this assignment is executed, the value on the right side is stored in the variable on the left side.

6. What is the difference between assignment operator and equality operator?

Ans. Assignment operator is used to assign the right hand side value into left hand side variable.

Example : A = 5, B = 10

Equality operator is used compare the values of both right hand side variable and left hand side variable and results in either true or false.

Example : A == B (a = 5, b = 5) True

A ≠ B (a = 5, b = 0) True.

SECTION - D

EXPLAIN IN DETAIL

1. Write the specification of an algorithm hypotenuse whose inputs are the lengths of the two Wshorter sides of a right angled triangle, and the output is the length of the third side.

Ans. **(i)** Let us name the algorithm hypotenuse.

(ii) It takes the number as the input. Let us name the input S1, S2 should not be negative.

(iii) It produces the Hypotenuse of S1, S2 as the output. Let us name the output *l*. Then S1, S2 should be the square of *l*.

Now the specification of the algorithm is

Hypotenuse (S1, S2)

- inputs : S1 and S2 are real numbers or integers.

- outputs :*l* is a real number such that $l^2 = S1^2 + S2^2$

2. Suppose you want to solve the quadratic equation $ax^2 + bx + c = 0$ by an algorithm. *[QY. 2018]*

quadratic_solve (a, b, c)

-- inputs : ?

-- outputs: ?

You intend to use the formula and you are prepared to handle only real number roots. Write a suitable specification.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Ans. Quadratic_solve (a, b, c)

-- inputs : a, b, c are real numbers, a ≠ 0

-- outputs : x is a real number, the quadration equation $ax^2 + bx + c = 0$ is satisfied by exactly two values fx, namely

$$x_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a} \text{ and}$$

$$x_2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

3. Exchange the contents: Given two glasses marked A and B. Glass A is full of apple drink and glass B is full of grape drink. For exchanging the contents of glasses A and B, represent the state by suitable variables, and write the specification of the algorithm. *[HY. 2018]*

Ans. **(i)** Let us name the algorithm exchange.

(ii) It takes the number as the input. Let us name the input a, b. a,b should not be zero.

(iii) It produces the exchange of a,b by using third variable t as the output. Let us name the output. Then a, b, t should be exchange of the drinks.

Now the specification of the algorithm is

Exchange (a, b)

-- inputs : a, b are integers, a ≠ 0, b ≠ 0

-- outputs : a, b are integers,

t : = a

a : = b

b := t

GOVERNMENT EXAM QUESTIONS AND ANSWERS

1 MARK

1. **If i:=7 before the assignment, i:=i*2. The value of i after the assignment is** *[Govt.MQP-2018]*

(a) 2 (b) 7
(c) 14 (d) 49 **[Ans. (c) 14]**

2. **If i =4; before the assignment, i: =i–1 after the assignment the value of i- is** *[HY. 2018]*

(a) 5 (b) 4 (c) 3 (d) 2
[Ans. (c) 3]

3. **Which is specified by the properties of the given input an the relation between the input and the desired output?** *[Mar. 2019; Sep. 2020]*

(a) algorithm (b) definition
(c) Specification (d) statement
[Ans. (c) Specification]

4. **Ignoring or hiding unnecessary details and modeling an entity only by its essential properties is known as:** *[June 2019]*

(a) Specification
(b) Abstraction
(c) Composition
(d) Decomposition
[Ans. (b) Abstraction]

5. **There are _____ important control flow statements.** *[QY. 2019]*

(a) 2 (b) 4 (c) 6 (d) 3
[Ans. (d) 3]

6. **Which are named boxes for storing data?**

(a) Control Flow (b) Algorithm *[HY. 2019]*
(c) Variables (d) Functions
[Ans. (c) Variables]

7. **After the assignment what values will be stored in the variables m, n?** *[Mar. 2020]*

(1) m,n:=10,5
(2) m,n = m+3, n–2
(3) m,n:= ??

(a) 3,13 (b) 10,13 (c) 13,3 (d) 10,5
[Ans. (c) 13,3]

8. **Before assignment** $x, y = 40, 20$,
After assignment $x, y := x + 5, y - 5$
What is the value of x, y ? *[Sep. 2021]*

(a) 45,15 (b) 45,25 (c) 20,30 (d) 35,25
[Ans. (b) 45, 15]

9. **An _____ is a step by step sequence of statements intended to solve a problem.** *[CRT '22]*

(a) Program (b) Algorithm
(c) Flow chart (d) Data
[Ans. (b) Algorithm]

10. **What are the values of variables m and n after assignment?** *[CRT '22]*

m, n : = 2, 5
m, n : = m+3, n+1

(a) 2, 5 (b) 3, 6 (c) 5, 4 (d) 4, 5
[Ans. (c) 5, 4]

2 MARKS

1. **Mention three important control flow statements.** *[Sep. 2021]*

Ans. **(i)** Sequential Control Flow
(ii) Alternative Control Flow
(iii) Iterative Control Flow.

3 MARKS

1. **List the building blocks of Algorithms.** *[Sep. 2021]*

Ans. **(i)** Data
(ii) Variables
(iii) Control flow
(iv) Functions

2. **Differentiate between alternative control flow and iterative control flow.** *[CRT '22]*

Ans. **Alternative control flow:** In alternative control flow, a condition of the state is tested, and if the condition is true, one statement is executed; if the condition is false, an alternative statement is executed.

Iterative control flow: In iterative control flow, a condition of the state is tested, and if the condition is true, a statement is executed. The two steps of testing the condition and executing the statement are repeated until the condition becomes false.

5 Marks

1. Explain the algorithm design techniques. *[HY. 2019]*

Ans. There are a few basic principles and techniques for designing algorithms.

(i) **Specification**: The first step in problem solving is to state the problem precisely. A problem is specified in terms of the input given and the output desired. The specification must also state the properties of the given input, and the relation between the input and the output.

(ii) **Abstraction:** A problem can involve a lot of details. Several of these details are unnecessary for solving the problem. Only a few details are essential. Ignoring or hiding unnecessary details and modeling an entity only by its essential properties is known as abstraction.

(iii) **Composition:** An algorithm is composed of assignment and control flow statements. A control flow statement tests a condition of the state and, depending on the value of the condition, decides the next statement to be executed.

(iv) **Decomposition:** We divide the main algorithm into functions. We construct each function independently of the main algorithm and other functions. Finally, we construct the main algorithm using the functions. When we use the functions, it is enough to know the specification of the function. It is not necessary to know how the function is implemented.

2. Write the specification of an algorithm for computing the square root of a number *[CRT '22]*

Ans. 1. Let us name the algorithm square_root.
2. It takes the number as the input. Let us name the input n. n should not be negative.
3. It produces the square root of n as the output. Let us name the output y. Then n should be the square of y.

Now the specification of the algorithm is
square_root(n)
-- inputs: n is a real number, $n \geq 0$.
-- outputs: y is a real number such that $y^2 = n$.

Additional Questions and Answers

Choose the Correct Answers 1 Mark

I. Choose the correct options for the below Questions.

1. Which of the following is(are) an example(s) of process?
(a) Getting ready to office in the morning
(b) Drawing, 'Kolams'
(c) Adding two numbers
(d) All of these **[Ans. (d) All of these]**

2. Instructions are also known as?
(a) Programs (b) Input
(c) Statements (d) Process
[Ans. (c) Statements]

3. Which must be expressed using statements of a programming language?
(a) Process (b) Instructions
(c) algorithms (d) Specification
[Ans. (c) algorithms]

4. Which is intended to solve a problem?
(a) Program (b) Statements
(c) Process (d) algorithm
[Ans. (d) algorithm]

5. How many basic building blocks are there to construct algorithms?
(a) 1 (b) 2 (c) 4 (d) 3
[Ans. (c) 4]

6. Which of the following not used to construct algorithm?
(a) Data (b) Process
(c) Control flow (d) Functions
[Ans. (b) Process]

7. Which of the following statement is used to change the value of variable?
(a) Arithmetic
(b) Assignment
(c) Arithmetic Assignment
(d) Relational **[Ans. (b) Assignment]**

8. Which changes when a process evolves?
(a) State (b) behaviour
(c) Process (d) Procedure
[Ans. (a) State]

9. How the state of the process represented in an algorithm?
(a) Data (b) Variables
(c) Statements (d) Program
[Ans. (b) Variables]

10. How many statements are there to alter the normal flow of control?
(a) 1 (b) 2 (c) 3 (d) many
[Ans. (c) 3]

11. Which of the following statement is not used to alter the normal flow of control?
(a) Sequential control flow
(b) Assignment control flow
(c) Alternative control flow
(d) Iterative control flow
[Ans. (b) Assignment control flow]

12. Which of the following statement is used to alter the normal flow of control?
(a) Sequential control flow
(b) Alternative control flow
(c) Iterative control flow
(d) All of these [Ans. (d) All of these]

13. In which control flow, the statements are repeated until the condition becomes false?
(a) sequential
(b) alternative control flow
(c) iterative
(d) all of these [Ans. (c) iterative]

14. Which of the following is not an algorithm design technique?
(a) Specification (b) Abstraction
(c) Control flow (d) Composition
[Ans. (c) Control flow]

15. Which of the following design technique state the relation between the input and the output?
(a) Specification (b) Abstraction
(c) Composition (d) Decomposition
[Ans. (a) Specification]

16. Which of the following design technique is used to hide the unnecessary details while solving the problem?
(a) Specification (b) Abstraction
(c) Composition (d) Decomposition
[Ans. (b) Abstraction]

17. How many principles and techniques are there for designing algorithms?
(a) 1 (b) 2 (c) 3 (d) 4
[Ans. (d) 4]

18. Which statements are used to an notate a program for the human readers?
(a) Assignment (b) Control flow
(c) Comments (d) Arithmetic
[Ans. (c) Comments]

19. How many standard specification format are there to design the algorithm?
(a) 2 (b) 3 (c) 4 (d) 1
[Ans. (a) 2]

20. Which serves as a contract between the designer and users of the algorithm?
(a) Abstraction (b) Specification
(c) Composition (d) Decomposition
[Ans. (b) Specification]

21. Which defines the rights and responsibilities of the algorithm?
(a) Abstraction (b) Composition
(c) Specification (d) None of these
[Ans. (c) Specification]

22. Which of the following is the responsibility of the algorithm designer and the sing of the algorithm user?
(a) Properties of input
(b) Input-output relation
(c) Properties output
(d) algorithm name
[Ans. (b) Input-output relation]

23. Which is the most effective tool used for manging program complexity?
(a) Specification (b) Control flow
(c) Composition (d) none of these
[Ans. (d) none of these]

24. Which of the following is a basic and important abstraction?
(a) State (b) Variable
(c) Control flow (d) Functions
[Ans. (a) State]

25. The right side of an assignment can be?
(a) A value (b) A variable
(c) An expression (d) Any one of these
[Ans. (d) Anyone of these]

II. Match List I with List II and Select the Correct Answer using the Codes given below.

1.

	List I		List II
(i)	Specification	1	hiding the details
(ii)	Abstraction	2	divide the main algorithm into functions
(iii)	Composition	3	relation between the I/O
(iv)	Decomposition	4	algorithm consists of control flow statements.

Codes:

	(i)	(ii)	(iii)	(iv)
(a)	4	1	3	2
(b)	1	3	2	4
(c)	3	1	4	2
(d)	4	3	1	2

[Ans. (c) (i)-3, (ii)-1, (iii)-4, (iv)-2]

2.

	List I		List II
(i)	Data	1	Execution of a statement
(ii)	Variables	2	Parts of an algorithm
(iii)	Control flow	3	Storing data
(iv)	Functions	4	Arithmetic operations

Codes:

	(i)	(ii)	(iii)	(iv)
(a)	4	1	3	2
(b)	1	3	2	4
(c)	3	1	4	2
(d)	4	3	1	2

[Ans. (d) (i)-4, (ii)-3, (iii)-1, (iv)-2]

III. Choose the Correct Option and Fill in the Blanks.

1. **In computers, operations on data performed by ..... .**

(a) instructions (b) program
(c) process (d) all of these

[Ans. (a) instructions]

2. **When operations are done on data, the results are stored in ..... .**

(a) control flow (b) functions
(c) variables (d) instructions

[Ans. (c) variables]

3. **The data stored in a variable is also called ..... .**

(a) value (b) process
(c) input (d) control flow

[Ans. (a) value]

4. **The input and output are passed between an algorithm and the user through ..... .**

(a) data (b) control flow
(c) variables (d) functions

[Ans. (c) variables]

5. **The symbol indicates the comment statement while specifying an algorithm is ..... .**

(a) – – (b) | |
| |
(c) ~ ~ (d) none of these

[Ans. (a) – –]

6. **Computational processes in the real world have ..... .**

(a) behaviour (b) Statements
(c) state (d) procedure

[Ans. (c) state]

7. **The order of execution of program statements is known as ..... .**

(a) variables (b) control flow
(c) functions (d) association

[Ans. (b) control flow]

8. **An algorithm is composed of the statements ..... .**

(a) assignment (b) control flow
(c) (a) and (b) (d) arithmetic

[Ans. (c) (a) and (b)]

9. **Decomposition means**

(a) States the relation between the input and the output
(b) Hiding unnecessary details
(c) An algorithm is composed of assignment and control flow statement
(d) Dividing the main algorithm into functions

[Ans. (d) Dividing the main algorithm into functions]

IV. Pick the Odd one Out.

1. (a) Composition (b) Abstraction
(c) Specification (d) Variables

[Ans. (d) Variables]

Reason : Variables are named boxes for storing data. Other three are basic principles and techniques for designing algorithms.

V. Which one of the Following is Not Correctly Matched?

1. **Which one of the following is not correctly matches?**
(a) Specification – First step in problem solving
(b) Abstraction – Ignore inessential details
(c) Composition – Assignment and control flow statements
(d) Decomposition – Relation between the input and the output

[Ans. (d) Decomposition – Relation between the input and the output]

VI. Consider the Following Statement.

1. **Assertion (A) :** A problem is specified in terms of the input given and the output desired.
Reason (R) : Ignoring or hiding unnecessary details and modeling an entity only by its essential properties is known as abstraction.
(a) Both (A) and (R) are true and (R) is the correct explanation of A.
(b) Both (A) and (R) are true and (R) is not the correct explanation of (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true.

[Ans. (b) Both (A) and (R) are true and (R) is not the correct explanation of (A)]

2. **Assertion (A) :** Abstraction is the most effective mental tool used for managing complexity.
Reason (R) : Assignment statement is used to store a value in a variable.
(a) Both (A) and (R) are true and (R) is the correct explanation of A.
(b) Both (A) and (R) are true and (R) is not the correct explanation of A.
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true.

[Ans. (b) Both (A) and (R) are true and (R) is not the correct explanation of (A)]

VII. Choose the Correct Statement.

1. **Which of the following statement is true?**
(a) Computational processes the state can not changes.
(b) As a process evolves, the state can not changes.
(c) Variables are not named boxes for storing data.
(d) Assignment statement is used to store the value of variable.

[Ans. (d) Assignment statement is used to store the value of variable.]

VIII. Point out the Wrong Statement in the Following.

1. **Which of the following statement is not true?**
(i) An algorithm is used to solve a problem
(ii) An instruction not describes an action
(iii) An algorithm is not a sequence of instructions
(iv) A process evolves when the instructions are executed.
(a) only (i)
(b) only (ii) and (iii) (c) only (i) and (iv)
(d) only (iii) and (iv) [Ans. (b) only (ii) and (iii)]

Very Short Answers 2 MARKS

1. **How will you construct an algorithm?**

Ans. **(i)** Data **(ii)** Variables
(iii) Control flow **(iv)** Functions.

2. **How do you know whether the state changes in an algorithm?**

Ans. As the values of the variables are changed, the state changes.

3. What is control flow?

Ans. The order in which the statements are executed may differ from the order in which they are written in the algorithm. This order of execution of statements is known as the control flow.

4. Name the basic principles and techniques for designing algorithms.

Ans. **(i)** Specification
(ii) Abstraction
(iii) Composition
(iv) Decomposition.

5. Write the goal of the algorithm.

Ans. The goal of the algorithm is to establish the relation between the input and the desired output.

6. Write the specification of an algorithm to compute the quotient and remainder after dividing two integers.

Ans. 1. divide (A , B)
2. -- inputs: A is an integer and B ≠ 0
3. -- outputs : A = q × B + r and 0 < r < B

7. Write the specification format of an algorithm for computing the square root of a number.

Ans. square_root(n)
-- inputs: n is a real number, n > 0.
-- outputs: y is a real number such that $y^2 = n$.

8. Which defines the rights and responsibilities of the designer and user of the algorithm?

Ans. Specification of an algorithm serves as a contract between the designer of the algorithm and the users of the algorithm, because it defines the rights and responsibilities of the designer and the user.

9. What is the use of abstraction?

Ans. The abstraction used in a variety of ways while constructing algorithms — in the specification of problems, representing state by variables, and decomposing an algorithm to functions.

10. What does specification of an algorithm consists?

Ans. The specification of an algorithm consists of the name of the algorithm (together with its inputs), the input property, and the desired input-output relation.

11. What does the specification abstracts in an algorithm?

Ans. Specification abstracts a problem by the properties of the inputs and the desired input-output relation.

12. Differentiate state and functions of an algorithm.

Ans.

State	Functions
In algorithms, the state of a computation is abstracted by a set of variables.	When an algorithm is very complex, we can decompose it into functions and abstract each function by its specification.

13. How the assignment statement changes the state of an algorithm?

Ans. Assignment statement changes the values of variables, and hence the state.

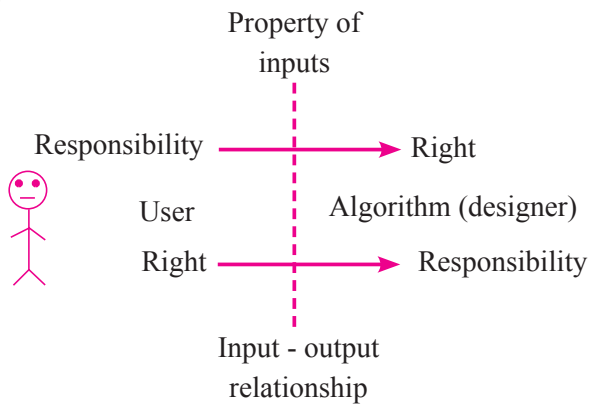
SHORT ANSWERS 3 MARKS

1. Differentiate initial and final state of an algorithm.

Ans. The inputs and outputs are passed between an algorithm and the user through variables. The values of the variables when the algorithm starts is known as the initial state, and the values of the variables when the algorithm finishes is known as the final state.

2. Define the input - output relationship between the designer and user of the algorithm.

Ans.



3. Write a note on the parts of specification of an algorithm.

Ans. The specification in a standard three part format:
The name of the algorithm and the inputs.
Input: the property of the inputs.

Output: the desired input-output relation.
The first part is the name of the algorithm and the inputs. The second part is the property of the inputs. It is written as a comment which starts with — inputs: The third part is the desired input-output relation. It written as a comment which starts with — outputs:. The input and output can be written using English and mathematical notation.

4. Define state of an algorithm?

Ans. State is a basic and important abstraction. Computational processes have state. A computational process starts with an initial state. As actions are performed, its state changes. It ends with a final state. State of a process is abstracted by a set of variables in the algorithm. The state at any point of execution is simply the values of the variables at that point.

Long Answers 5 MARKS

1. Explain in detail how will you construct an algorithm. Whatever with in (or) Explain the Building Blocks of Algorithms.

Ans. To construct algorithms using basic building blocks such as. Data, Variables, Control flow, Functions.

Data :

Algorithms take input data, process the data, and produce output data. Computers provide instructions to perform operations on data. For example, there are instructions for doing arithmetic operations on numbers, such as add, subtract, multiply and divide. There are different kinds of data such as numbers and text.

Variables :

Variables are named boxes for storing data. When we do operations on data, we need to store the results in variables. The data stored in a variable is also known as the value of the variable. We can store a value in a variable or change the value of variable, using an assignment statement.

Control flow :

An algorithm is a sequence of statements. However, after executing a statement, the next statement to be executed need not be the next statement in the algorithm. The statement to be executed next may depend on the state of the process. Thus, the order in which the statements are executed may differ from the order in which they are written in the algorithm. This order of execution of statements is known as the control flow.

Functions :

Algorithms can become very complex. The variables of an algorithm and dependencies among the variables may be too many. Then, it is difficult to build algorithms correctly. In such situations, we break an algorithm into parts, construct each part separately, and then integrate the parts to the complete algorithm.
The parts of an algorithm are known as functions. A function is like a sub algorithm. It takes an input, and produces an output, satisfying a desired input output relation.

2. Explain the types of control flow statements.

Ans. There are three important control flow statements to alter the control flow depending on the state.

(i) In sequential control flow, a sequence of statements are executed one after another in the same order as they are written.

(ii) In alternative control flow, a condition of the state is tested, and if the condition is true, one statement is executed; if the condition is false, an alternative statement is executed.

(iii) In iterative control flow, a condition of the state is tested, and if the condition is true, a statement is executed. The two steps of testing the condition and executing the statement are repeated until the condition becomes false.

☆☆☆

CHAPTER 11 FUNCTIONS

CHAPTER SNAPSHOT

EVALUATION

SECTION - A

CHOOSE THE CORRECT ANSWER

1. Which of the following header file defines the standard I/O predefined functions? *[Sep. 2020]*

(a) stdio.h (b) math.h
(c) string.h (d) ctype.h

[Ans. (a) stdio.h]

2. Which function is used to check whether a character is alphanumeric or not: *[Mar. 2019 & 2020]*

(a) isalpha() (b) isdigit()
(c) isalnum() (d) islower()

[Ans. (c) isalnum()]

3. Which function begins the program execution? *[June 2019; Aug '22]*

(a) isalpha() (b) isdigit()
(c) main() (d) islower()

[Ans. (c) main()]

4. Which of the following function is with a return value and without any argument? *[QY. 2019]*

(a) x=display(int, int) (b) x=display()
(c) y=display(float) (d) display(int)

[Ans. (b) x=display()]

5. Which is return data type of the function prototype of add(int, int);? *[Sep. 2021]*

(a) int (b) float
(c) char (d) double **[Ans. (a) int]**

6. Which of the following is the scope operator?

(a) > (b) &
(c) % (d) :: **[Ans. (d) ::]**

SECTION - B

VERY SHORT ANSWERS

1. Define Functions. *[QY. 2019; Sep. 2021]*

Ans. A large program can typically be split into small subprograms (blocks) called as functions where each sub-program can perform some specific functionality. Functions reduce the size and complexity of a program, makes it easier to understand, test, and check for errors.

2. Write about strlen() function. *[Sep. 2020]*

Ans. The strelen() takes a null terminated string as its argument and returns its length. The length does not include the null(\0) character.

Ex :

```
name = "vijay"
strlen(name); [length of the name = 5].
```

3. What are importance of void data type? *[Mar. 2020; May '22]*

Ans. **Void type has two important purposes:**

(i) To indicate the function does not return a value
(ii) To declare a generic pointer.

4. What is Parameter and list its types? *[June 2019]*

Ans. **(i)** Arguments or parameters are the means to pass values from the calling function to the called function.
(ii) The variables used in the function definition as parameters are known as formal parameters.
(iii) The constants, variables or expressions used in the function call are known as actual parameters.

5. Write a note on Local Scope. *[Aug '22]*

Ans. **(i)** A local variable is defined within a block. A block of code begins and ends with curly braces {}
(ii) The scope of a local variable is the block in which it is defined.
(iii) A local variable cannot be accessed from outside the block of its declaration.
(iv) A local variable is created upon entry into its block and destroyed upon exit.

SECTION - C

SHORT ANSWERS

1. What is Built-in functions?

Ans. C++ provides a rich collection of functions ready to be used for various tasks. The tasks to be performed by each of these are already written, debugged and

compiled, their definitions alone are grouped and stored in files called header files. Such ready-to-use sub programs are called pre-defined functions or build-in functions.

2. What is the difference between isupper() and toupper() functions? *[June 2019]*

Ans.

isupper()	toupper()
This function is used to check the given character is upper case	This function is used to convert the given character into its uppercese
This function will return 1 if true otherwise 0	This function will return the uppercase equivalent of the given character
Example : isupper('a') will return 0	**Example :** toupper('a') will return 'A'

3. Write about strcmp() function. *[Mar. 2020]*

Ans. The strcmp() function takes two arguments: string1 and string 2. It compares the contents of string1 and string2 lexicographically.

The strcmp() function returns a:

(i) Positive value if the first differing character in string1 is greater than the corresponding character in string2. (ASCII values are compared).

(ii) Negative value if the first differing character in string1 is less than the corresponding character in string2.

(iii) 0 if string1 and strin2 are equal.

4. Write short note on pow() function in C++.

Ans. The pow() function returns base raised to the power of exponent. If any argument passed to pow() is long double, the return type is promoted to long double. If not, the return type is double. The pow() function takes two arguments.

(i) base- the base value

(ii) exponent - exponent of the base.

5. What are the information the prototype provides to the compiler?

Ans. **(i)** The return value of the function is of type long.

(ii) fact is the name of the function

(iii) The function is called with two arguments:
The first argument is of int data type
The second argument is of double data type.
The function prototype provides details about the return data type, name of the function and a list of formal parameters or arguments.

6. What is default arguments ? Give example.
[HY. 2019; Sep. 2021]

Ans. In C++, one can assign default values to the formal parameters of a function prototype. The Default arguments allows to omit some arguments when calling the function.

When calling a function,

(i) For any missing arguments, complier uses the values in default arguments for the called function.

(ii) The default value is given in the form of variable initialization.

Example: void defaultvalue(int n1=10, n2=100);

- The default arguments facilitate the function call statement with partial or no arguments.

Example :

```
defaultvalue(x,y);
defaultvalue(200,150);
defaultvalue(150);
defaultvalue(x,150);
```

SECTION - D

EXPLAIN IN DETAIL

1. Explain Call by value method with suitable example. *[Mar. 2019 ; Sep.2020; Aug '22]*

Ans. Call by value method copies the value of an actual parameter into the formal parameter of the function. In this case, changes made to formal parameter within the function will have no effect on the actual parameter.

Example :

```
#include<iostream>
using namespace std;
void display(int x)
```

CHAPTER 12 ARRAYS AND STRUCTURES

CHAPTER SNAPSHOT

EVALUATION

SECTION - A

CHOOSE THE CORRECT ANSWER

1. Which of the following is the collection of variables of the same type that an referenced by a common name? *[May ' 22]*

(a) int (b) float
(c) Array (d) class **[Ans. (c) Array]**

2. int age[]={6,90,20,18,2}; How many elements are there in this array? *[Aug '22]*

(a) 2 (b) 5
(c) 6 (d) 4 **[Ans. (b) 5]**

3. cin>>n[3]; To which element does this statement accept the value? *[HY. 2019]*

(a) 2 (b) 3
(c) 4 (d) 5 **[Ans. (c) 4]**

4. By default, a string ends with which character? *[Sep. 2021]*

(a) \o (b) \t
(c) \n (d) \b **[Ans. (a) \o]**

5. Structure definition is terminated by

(a) : (b) }
(c) ; (d) :: **[Ans. (c) ;]**

6. What will happen when the structure is declared?

(a) it will not allocate any memory
(b) it will allocate the memory
(c) it will be declared and initialized
(d) it will be only declared

[Ans. (a) it will not allocate any memory]

7. A structure declaration is given below: *[Mar. 2019]*

```
struct Time
{
int hours;
int minutes;
int seconds;
}t;
```

Using above declaration which of the following refers to seconds.

(a) Time.seconds (b) Time::seconds
(c) seconds (d) t.seconds

[Ans. (d) t.seconds]

8. Which of the following is a properly defined structure?

(a) struct {int num;} (b) struct sum {int num;}
(c) struct sum int sum; (d) struct sum {int num;};

[Ans. (d) struct sum {int num;};]

9. A structure declaration is given below

```
struct employee
{
int empno;
char ename[10];
}e[5];
```

Using above declaration which of the following statement is correct.

(a) cout<<e[0].empno<<e[0].ename;
(b) cout<<e[0].empno<<ename;
(c) cout<<e[0]->empno<<e[0]->ename;
(d) cout<<e.empno<<e.ename;

[Ans. (a) cout<<e[0].empno<<e[0].ename;]

10. When accessing a structure member, the identifier to the left of the dot operator is the name of *[HY. 2018]*

(a) structure variable (b) structure tag
(c) structure member (d) structure function

[Ans. (a) structure variable]

SECTION - B

VERY SHORT ANSWERS

1. What is Traversal in an Array?

Ans. Accessing each element of an array at least once to perform any operation is known as "Traversal". Displaying all the elements in an array is an example of "traversal".

2. What is Strings?

Ans. A string is defined as a sequence of characters where each character may be a letter, number or a symbol.

3. What is the syntax to declare two-dimensional array? *[HY. 2018; May '22]*

Ans. The declaration of a 2-D array is
data-type array_name [row-size] [col-size];

```
cout<<"English:"<<s[i].eng<<endl;
cout<<"Physics:"<<s[i].phy<<endl;
cout<<"Chemistry:"<<s[i].che<<endl;
cout<<"Maths:"<<s[i].mat<<endl;
cout<<"Csc:"<<s[i].csc<<endl;
total=s[i].lans+s[i].eng+s[i].phy+s[i].che+s[i].
                                    mat+s[i].csc;
cout<<"Total':"<<total<<endl;
}
```

4. How to access members of a structure? Give example. *[Mar. 2020]*

Ans. A structure object can also be assigned to another structure object only if both the objects are of same structure type.

Example : (i) s.name (ii) s.rollno

5. What is called anonymous structure? Give an example.

Ans. A structure without a name/tag is called anonymous structure.

Example:

```
struct
{
long rollno;
int age;
float weight;
} student;
```

The student can be referred as reference name to the above structure and the elements can be accessed like student.rollno, student.age and student weight

SECTION - D

EXPLAIN IN DETAIL

1. Write a C++ program to find the difference between two matrix. *[June 2019]*

Ans.

```
#include<iostream.h>
using namespace std;
int main()
{
int i,j, A[10][10], B[10][10], m,n;
cout<<"Enter number of rows"<<endl;
cin>>m;
cout<<"Enter number of columns"<<endl;
cin>>n;
cout<<"Enter the elements of A matrix"<<endl;
        for (i = 0; i<m; i++)
        {
        for (j = 0; j<n; j++)
        {
        cin>>A[i][j];
        }
}
cout<<"Enter the elements of B matrix" <<endl;
                                for (i = o ; i<m; i++)
{
        for (i = 0; i<m; i++)
        {
        for (j = 0; j<n; j++)
        {
        cin>>B[i][j];
        }
}
count cc"The difference between the matrices"
                                        <<endl;
}
        for (i = 0; i<m; i++)
        {
        for (j = 0; j<n; j++)
        {
        cout<<(A[i][j] – B [i][j]<<"s/t"
        }
        cout <<"/n";
        }
}
```

2. Write a C++ program to add two distances using the following structure definition.

```
struct Distance{
int feet;
float inch;
}d1, d2, sum;
```

Ans.

```
#include<iostream>
using namespace std;
struct Distance
{
   int feet;
   float inch;
}d1, d2, sum;
int main( )
{
   cout<< "Enter first distance:"<<endl;
   cout<< "Enter feet:"<<endl;
   cin>>d1.feet;
   cout<< "Enter inch:"<<endl;
   cin>>d1.inch;
   cout<<"Enter second distance" <<end1;
   cout<< "Enter feet;" end1;
   cin>>d2.feet;
   cout << "Enter inch : "<<end1;
```

ADDITIONAL QUESTIONS AND ANSWERS

CHOOSE THE CORRECT ANSWERS 1 MARK

I. CHOOSE THE CORRECT OPTIONS FOR THE BELOW QUESTIONS.

1. Which of the following concept helps to store multiple values in a single variable?
(a) function (b) Array
(c) overloading (d) abstraction
[Ans. (b) Array]

2. Which of the following is a derived datatype?
(a) Array (b) structure
(c) void (d) both a and b
[Ans. (d) both a and b]

3. How many types of arrays in C++?
(a) 2 (b) 3
(c) 4 (d) many [Ans. (a) 2]

4. In which array the values are arranged in a single row?
(a) 2D (b) Multi Dimensional
(c) 1D (d) 5D [Ans. (c) 1D]

5. Which of the following is a correct syntax?
(a) <datatype> [array size] <array name>;
(b) <datatype> <array name> [array size];
(c) <array name> [array size] [datatype];
(d) [datatype] <array name> <array size>;
[Ans. (b) <datatype> <array name> [array size];]

6. How many bytes allocated to int datatype by Turbo C++?
(a) 2 (b) 4
(c) 8 (d) 10 [Ans. (b) 4]

7. How many number of bytes occupied by the array n? float n[5];
(a) 10 (b) 5
(c) 20 (d) 40 [Ans. (c) 20]

8. How many byte(s) of memory occupied by each character in a string?
(a) 2 (b) 1
(c) 4 (d) 8 [Ans. (b) 1]

9. In C++, which datatype is used to represent a string?
(a) string (b) long char
(c) short char (d) no datatype
[Ans. (d) no datatype]

10. What must be known in advance while creating an array?
(a) index number (b) subscript
(c) length (d) elements
[Ans. (c) length]

11. In an array char str[5]={'A', 'B', 'C'}; what is the value of str[4]?
(a) A (b) B
(c) NULL (d) 0 [Ans. (c) NULL]

12. How many arguments are there in get() function?
(a) 2 (b) 3
(c) only one (d) 4 [Ans. (a) 2]

13. How many types of 2D array memory representations?
(a) 4 (b) 3
(c) 2 (d) 5 [Ans. (c) 2]

14. Which of the following allows to group of variables of mixed datatypes together into a single unit?
(a) Structures (b) Arrays
(c) functions (d) loops
[Ans. (a) Structures]

15. Which of the following can be used to represent objects of uniform datatypes?
(a) Structures (b) functions
(c) overloading (d) Arrays
[Ans. (d) Arrays]

16. Which of the following increases the time consumption while searching?
(a) Structures (b) Arrays
(c) functions (d) built-in functions
[Ans. (b) Arrays]

17. Which of the following provides a facility to store different datatypes?
(a) Arrays (b) functions
(c) inline (d) Structures
[Ans. (d) Structures]

18. How many variables can be defined in the same struct type?
(a) 2 (b) 4
(c) 10 (d) many [Ans. (d) many]

19. Which of the following is used to access the members of the class?
(a) ? (b) :
(c) . (d) ; [Ans. (c) .]

20. Which of the following is exist between the object name and the member name?
(a) dot (b) colon
(c) comma (d) semicolon
[Ans. (a) dot]

21. Which of the following is used to access the pointer type members of the structure?
(a) * (b) .
(c) : (d) → [Ans. (d) →]

22. Which of the following can be passed to a function in a similar way of passing an argument that is of built-in datatype?
(a) structure variable (b) ordinary variable
(c) pointer variable (d) array variable
[Ans. (a) structure variable]

23. Which of the following methods, the contents of structure variable in a function changed are reflected back to the calling functions?
(i) call by value
(ii) call by reference
(a) only (i) (b) only (ii)
(c) both (i) and (ii) (d) none of these
[Ans. (c) both (i) and (ii)]

24. Write the output of the following snippet.
```
int n[4] = {50, 40, 30, 20};
int m = 3;
cout <<n[m = m-1];
```
(a) 50 (b) 40 (c) 30 (d) 20
[Ans. (c) 30]

25. How many types of memory reserved by an array char name[20];?
(a) 20 (b) 40
(c) 160 (d) 80 [Ans. (a) 20]

26. What is the length of char a[]= "CHENNAI";
(a) 7 (b) 10
(c) 9 (d) 8 [Ans. (d) 8]

II. Choose the Correct Option and Fill in the Blanks.

1. When a structure is passed as argument to a function using ..... .
(i) call by value method
(ii) call by reference method
(a) only (i) (b) only (ii)
(c) both (i) and (ii) (d) none of these
[Ans. (c) both (i) and (ii)]

2. The address of the structure variable is passed to the function using the operator ..... .
(a) * (b) →
(c) @ (d) & [Ans. (d) &]

3. Structure variable can passed by ..... .
(i) by value (ii) by reference
(a) only (i) (b) only (ii)
(c) both (i) or (ii) (d) none of these
[Ans. (c) both (i) or (ii)]

4. The size of an array should be specified in ..... .
(a) < > (b) { } (c) ( ) (d) [ ]
[Ans. (d) [ ]]

5. Array index number always start from ..... .
(a) 0 (b) 1
(c) n (d) n-1 [Ans. (a) 0]

6. Array index number always ..... .
(a) Signed integer (b) Unsigned integer
(c) Unsigned float (d) Unsigned value
[Ans. (b) Unsigned integer]

7. A unique index number is also known as ..... .
(a) super script (b) subnumber
(c) subscript (d) none of these
[Ans. (c) subscript]

8. If array is not initialized, all the array elements contain ..... .
(a) initial value (b) garbage value
(c) final value (d) no value
[Ans. (b) garbage value]

9. Which declaring and initialized values in an array, the values are enclosed in ..... .
(a) { } (b) ( )
(c) < > (d) [ ] [Ans. (a) { }]

10. The subscript in bracket can be a ..... .
(a) variable (b) constant
(c) expression (d) all of these
[Ans. (d) all of these]

11. Displaying all the elements in an array is an example of ..... .
(a) Object definition (b) Traversal
(c) Overloading (d) functions
[Ans. (b) Traversal]

12. In C++, there is no datatype to represent a ..... .
(a) integer (b) character
(c) exponential value (d) string [Ans. (d) string]

UNIT- IV OBJECT ORIENTED PROGRAMMING WITH C++

CHAPTER 13 INTRODUCTION TO OBJECT ORIENTED PROGRAMMING TECHNIQUES

CHAPTER SNAPSHOT

EVALUATION

SECTION - A

CHOOSE THE CORRECT ANSWER

1. The term is used to describe a programming approach based on classes and objects is

(a) OOP (b) POP
(c) ADT (d) SOP

[Ans. (a) OOP]

2. The paradigm which aims more at procedures.

(a) Object Oriented Programming
(b) Procedural programming
(c) Modular programming
(d) Structural programming

[Ans. (b) Procedural programming]

3. Which of the following is a user defined data type? *[HY. 2019; Mar. 2020]*

(a) class (b) float
(c) int (d) object **[Ans. (a) class]**

4. The identifiable entity with some characteristics and behaviour is

(a) class (b) object
(c) structure (d) member

[Ans. (b) object]

5. The mechanism by which the data and functions are bound together into a single unit is known as *[Sep. 2021]*

(a) Inheritance (b) Encapsulation
(c) Polymorphism (d) Abstraction

[Ans. (b) Encapsulation]

6. Insulation of the data from direct access by the program is called as

(a) Data hiding (b) Encapsulation
(c) Polymorphism (d) Abstraction

[Ans. (a) Data hiding]

7. Which of the following concept encapsulate all the essential properties of the object that are to be created?

(a) class (b) Encapsulation
(c) Polymorphism (d) Abstraction

[Ans. (d) Abstraction]

8. Which of the following is the most important advantage of inheritance?

(a) data hiding (b) code reusability
(c) code modification (d) accessibility

[Ans. (b) code reusability]

9. "Write once and use it multiple time" can be achieved by *[May ' 22]*

(a) redundancy (b) reusability
(c) modification (d) composition

[Ans. (b) reusability]

10. Which of the following supports the transitive nature of data? *[Sep. 2020]*

(a) Inheritance (b) Encapsulation
(c) Polymorphism (d) Abstraction

[Ans. (a) Inheritance]

SECTION - B

VERY SHORT ANSWERS

1. How is modular programming different from procedural programming paradigm?

Ans. **(i)** Procedural means a list of instructions were given to the computer to do something. Procedural programming aims more at procedures. This emphasis on doing things.

(ii) Modular programming consist of a list of instructions that instructs the computer to do something. But this Paradigm consists of multiple modules, each module has a set of functions of related types. Data is hidden under the modules. Arrangement of data can be changed only by modifying the module.

2. Differentiate classes and objects.

Ans.

Class	Objects
A Class is a construct in C++ which is used to bind data and its associated function together into a single unit using the encapsulation concept.	Represents data and its associated function together into a single unit. Objects are the basic unit of oop.
Class is a user defined data type. Class represents a group of similar objects	Basically an object is created from a class. They are instances of class also called as class variable

3. What is polymorphism? *[June 2019; Mar. 2020]*

Ans. Polymorphism is the ability of a message or function to be displayed in more than one form.

4. How is encapsulation and abstraction are interrelated?

Ans. Classes use the concept of abstraction to define a list of abstract attributes and function which operate on these attribute. They encapsulate all the essential properties of the object that are to be created.

5. Write the disadvantages of OOP. *[HY. 2018; Mar. 2019; Sep. 2021]*

Ans. **(i) Size :** Object Oriented Programs are much larger than other programs.

(ii) Effort: Object Oriented Programs require a lot of work to create.

(iii) Speed: Object Oriented Programs are slower than other programs, because of their size.

SECTION - C

SHORT ANSWERS

1. What is paradigm? Mention the different types of paradigm?

Ans. Paradigm means organizing principle of a program. It is an approach to programming. There are different approaches available for problem solving using computer. They are Procedural programming, Modular Programming and Object Oriented Programming.

2. Write a note on the features of procedural programming.

Ans. **(i)** Programs are organized in the form of subroutines or sub programs.

(ii) All data items are global.

(iii) Suitable for small sized software application.

(iv) Difficult to maintain and enhance the program code as any change in data type needs to be propagated to all subroutines that use the same data type. This is time consuming.

(v) **Example:** FORTRAN and COBOL.

3. List some of the features of modular programming. *[June 2019 ; Sep. 2020]*

Ans. (i) Emphasis on algorithm rather than data.

(ii) Programs are divided into individual modules.

(iii) Each modules are independent of each other and have their own local data.

(iv) Modules can work with its own data as well as with the data passed to it.

(v) **Example:** Pascal and C.

4. What do you mean by modularization and software reuse? *[HY. 2018]*

Ans. (i) **Modularisation:** where the program can be decomposed into modules.

(ii) **Software re-use:** where a program can be composed from existing and new modules.

5. Define information hiding.

Ans. Encapsulation is the most striking feature of a class. The data is not accessible to the outside world, and only those functions which are wrapped in the class can access it. These functions provide the interface between the object's data and the program. This encapsulation of data from direct access by the program is called data hiding or information hiding.

SECTION - D

EXPLAIN IN DETAIL

1. Write the differences between Object Oriented Programming and procedural programming. *[June 2019 ; Sep. 2020]*

Ans.

Procedural programming	Object Oriented Programming
It deals with algorithms	It deals with data.
Programs are divided into functions.	Programs are divided into objects.
Data move from function to function.	Functions that operate on data are bind to form classes.
It is top down approach.	It is Bottom up approach.
Do not have any access specifiers.	It has access specifiers like private, public and protected.
Less secure	More secure.
It follows No over loading	If follows operator over loading and function overloading.
Data can move freely from function to function in the system	In OOP, objects can move and communicate with each other through member functions.
Importance is not given to data but to functions as well as sequence of actions to be done	Importance is given to data rather than procedures or functions because it works as a real world.
Example : C,VB, FORTRAN, Pascal, COBOL.	**Example :** C++,JAVA, VB.NET, C#.NET, Python

5 Marks

1. Explain the main features of OOPs. *[Mar. 2020]*

Ans.

(i) The mechanism by which the data and functions are bound together into a single unit is known as ENCAPSULATION. It implements abstraction.

(ii) Abstraction refers to showing only the essential features without revealing background details.

(iii) Modularity is designing a system that is divided into a set of functional units that can be composed into a larger application.

(iv) Polymorphims is the ability of a message or function to be displayed in more than one form.

(v) Inheritance is the technique of building new classes (derived class) from an existing class.

(vi) The most important advantage of inheritance is code reusability. Inheritance is transitive in nature.

2. Write a note on the main features of object oriented programming. *[Sep. 2020]*

Ans. **Important features of Object oriented programming :**

(i) Emphasizes on data rather than algorithm.

(ii) Data abstraction is introduced in addition to procedural abstraction.

(iii) Data and its associated operations are grouped in to single unit.

(iv) Programs are designed around the data being operated

(v) Relationships can be created between similar, yet distinct data types

(vi) **Example:** C++, Java, VB.Net, Python etc.

3. Explain the advantages of object oriented programming. *[May '22]*

Ans. **Advantages of OOP:**

(i) **Re-usability:** "Write once and use it multiple times" you can achieve this by using class.

(ii) **Redundancy:** Inheritance is the good feature for data redundancy. If you need a same functionality in multiple class you can write a common class for the same functionality and inherit that class to sub class.

(iii) **Easy Maintenance:** It is easy to maintain and modify existing code as new objects can be created with small difference to existing ones.

(iv) **Security:** Using data hinding and abstraction only necessary data will be provided thus maintains the security of data.

Additional Questions and Answers

Choose the Correct Answers 1 Mark

I. Choose the correct options for the below Questions.

1. Which of the following allows us to organize software as a collection of data and behaviour?

(a) Object-Oriented paradigm
(b) Procedural Programming Paradigm
(c) Modular Programming Paradigm
(d) All of these

[Ans. (a) Object-Oriented paradigm]

2. Which of the following consists of both data and behaviour?

(a) Modules (b) Procedure
(c) Object (d) functions

[Ans. (c) Object]

3. Which of the following is not an approach to programming?

(a) Instruction oriented programming paradigm
(b) Procedural programming paradigm
(c) Modular programming paradigm
(d) Object oriented paradigm

[Ans. (a) Instruction oriented programming paradigm]

4. In which year the term object appeared in relation to programming languages?

(a) 1990's (b) 1980's
(c) 1995's (d) 2000's

[Ans. (b) 1980's]

5. Which of the following means organizing principle of a program?

(a) OPPs (b) Modules
(c) Sub-routines (d) Paradigm

[Ans. (d) Paradigm]

11th STD

INSTANT SUPPLEMENTARY EXAM - August 2022
COMPUTER SCIENCE

Reg. No.

TIME ALLOWED : 3.00 Hours] PART - III [MAXIMUM MARKS : 70

Instructions :

1) Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
2) Use **Blue** or **Black** ink to write and underline and pencil to draw diagrams.

PART - I

Note : (i) Answer **all** the questions. **15 × 1 = 15**
(ii) Choose the most appropriate answer from the given **four** alternatives and write the option code and the corresponding answer.

1. _____ is the main component of Second Generation computers.
(a) Vacuum tubes (b) Transistors
(c) Integrated circuits (d) Microprocessors

2. How many bytes does 1 kilobyte contain?
(a) 1000 (b) 8 (c) 4 (d) 1024

3. Which is the fastest memory?
(a) Hard disc (b) Main memory
(c) Cache memory (d) Blue-ray disc

4. Operating system is a _____.
(a) Application software (b) Hardware
(c) System software (d) Component

5. The shortcut key used to rename file in windows:
(a) F2 (b) F4 (c) F5 (d) F6

6. Which of the following operator is extraction operator in C++?
(a) >> (b) << (c) <> (d) ^^

7. Which of the following is a valid string literal?
(a) 'A' (b) 'Welcome'
(c) 1232 (d) "1232"

8. The multi way branch statement:
(a) if (b) if...else (c) Switch (d) for

9. Which of the following is the exit control loop?
(a) for (b) while
(c) do...while (d) if...else

10. Which function begins the program execution?
(a) isalpha() (b) isdigit()
(c) main() (d) islower()

11. int age[] = {6, 90, 12, 18, 2};
How many elements are there in this array?
(a) 2 (b) 5 (c) 6 (d) 4

12. How many access specifiers declared inside class definition?
(a) 3 (b) 2 (c) 4 (d) 1

13. How many types are there in inheritance?
(a) 5 (b) 4 (c) 3 (d) 2

14. Which one of the following is Harass through online?
(a) Cyber terrorism (b) Scam
(c) Cyber stalking (d) Fraud

15. Class product
{
int code, quantity;
float price;
};
int main()
{
product p1, p2;
return 0;
}
How many bytes will be allocated with memory space of object p1?
(a) 4 bytes (b) 12 bytes (c) 8 bytes (d) 2 bytes

PART - II

Note : Answer **any six** questions. Question No. **24** is **compulsory**. **6 × 2 = 12**

16. What is a computer?
17. Write a short note on Hexadecimal Number System.
18. Convert $(46)_{10}$ into Binary number.
19. Define software and mention its types.
20. Differentiate files and folders.
21. What is the difference between an algorithm and a program?
22. Write about the Input/Output operators in C++.
23. What is harvesting?
24. What is an Instruction Set?

PART - III

Note : Answer **any six** of the following questions. Question No. **33** is **compulsory.** **6 × 3 = 18**

25. What is radix of a number system? Give examples.
26. Explain the types of RAM.
27. What are the functions of windows operating system?
28. Write the procedure to create a file in wordpad.
29. Write a note on logical operators.
30. Write a C++ program to print multiplication table of a given number using for-loop.
31. Write a note on local scope.
32. What is Array of strings?
33. What is meant by Computer Ethics?

PART - IV

Note : Answer **all** the questions. **5 × 5 = 25**

34. (a) Explain the various generation of computers.
(OR)
(b) Explain 1's compliment representation with an example.

35. (a) Explain the characteristics of a microprocessor.
(OR)
(b) Explain if...else statement with a suitable example.

36. (a) Explain the different types of inheritance.
(OR)
(b) Explain case analysis with an example.

37. (a) Explain the use of header file with examples.
(OR)
(b) What is an entry control loop? Explain any one of the entry controlled loop with suitable example.

38. (a) Explain call by value method with suitable example.
(OR)
(b) What are the rules for operator overloading?

❁❁❁❁

ANSWERS

PART - I

1. (b) Transistors
2. (d) 1024
3. (c) Cache Memory
4. (c) System software
5. (a) F2
6. (a) >>
7. (d) "1232"
8. (c) Switch
9. (c) do...while
10. (c) main( )
11. (b) 5
12. (a) 3
13. (a) 5
14. (c) Cyber stalking
15. (b) 12 bytes

PART - II

16. **(i)** A computer is an electronic device that manipulates information, or data. It has the ability to store, retrieve, and process data.
(ii) Computer works faster than human being and given the values more accuracy and reliable.

17. **(i)** The base or radix is 16. Thus it has 16 possible digit symbols. It uses the digits 0 to 9 plus the letters A, B, C, D, E and F (with respect to 10, 11, 12, 13, 14, 15).
(ii) It is generally used in micro computers.
Eg. $(ABC)_{16}$.

18.
2	46	
2	23	– 0
2	11	– 1
2	5	– 1
2	2	– 1
	1	– 0

$(46)_{10} = (101110)_2$

19. A software is set of instructions that perform specific task. It interacts basically with the hardware to generate the desired output. Software is classified into two types:
1) Application Software 2) System Software

20.

Files	Folders
File is the collection of records.	Folder is a collections of files.
Create a file : Start → All Programs → select application → ok	**Create a folders :** Right click → New → folder → ok

21. An algorithm is a self-contained step-by-step set of operations to be performed to solve a specific problems. A computer program is a sequence of instructions that complete the rules of a specific programming language, written to perform a specified task with a computer.