

Part-III COMPUTER SCIENCE

Maximum: 60 Scores

Answer any five questions from 1 to 6. Each carries 1 Score. (5×1=5)

1. Name the ancient number system with the largest base.

A: Sumerian/Babylonian number system (Base 60)

2. Each digit of a binary number is called _____

A: a bit

3. The number of symbols used in a number system is _____

A: the base

4. What is the use of Rhombus symbol in flowchart?

A: For decision

5. Program written in HLL is known as _____

A: Source code

6. Fundamental building blocks of the program is called _____

A: Tokens

Answer any nine questions from 7 to 17. Each carries 2 Scores. (9×2=18)

7. Match the following:

a) First Generation Computer	i) Microprocessor
b) Second Generation Computer	ii) Vacuum Tube

c) Third Generation Computer	iii) Transistor
d) Fourth Generation Computer	iv) Integrated circuit

A:

a) First Generation Computer	ii) Vacuum Tube
b) Second Generation Computer	iii) Transistor
c) Third Generation Computer	iv) Integrated circuit
d) Fourth Generation Computer	i) Microprocessor

8. State De-Morgan's theorems.

A: De Morgan's two theorems are

$$1. \overline{X + Y} = \bar{X} \cdot \bar{Y}$$

$$2. \overline{X \cdot Y} = \bar{X} + \bar{Y}$$

9. Name any two Universal Gates.

A: NAND and NOR

10. Do the following number conversions.

a) $(34)_8$ to decimal

A: 28

b) $(234)_{10}$ to binary.

A: 11101010

11. Write the names of any four CPU registers.

A: Accumulater, Memory Address Register (MAR), Memory Buffer Register (MBR), Instruction Register (IR), Program Counter (PC)

12. Compare RAM and ROM.

RAM	ROM
It is faster than	Slower
It stores OS, programs and data	It stores boot programs
It allows reading and writing	Allows reading only
It is volatile	Non-volatile

13. List four major functions of operating system.

A: Process management, file management, device management, memory management.

14. Define the term debugging. Write the names of two phases that are included in debugging.

A: Debugging is the process of detecting and correcting errors (bugs). Translation, Debugging and Execution are the related phases.

15. Write an algorithm to find the sum and average of three numbers.

A: Let A, B and C are the three numbers, S is the sum and Avg is the average.

Step 1: Start

Step 2: Input A,B and C

Step 3: $S=A+B+C$

Step 4: $Avg = S/3$

Step 7: Print S and Avg

Step 8: Stop

16. List any 4 Tokens available in C++,

A: Keywords, Identifiers, Literals, Punctuators and Operators

17. Write a short note on C++ character set.

A: C++ character set includes Letters (A B C D ..., a b c d ...), Digits (0,1, 2 ...), Special characters (* # ;& { ' % ...), white spaces (space, tab etc.) and other characters.

Answer any nine questions from 18 to 28. Each carries 3 Scores. (9×3=27)

18. Compare any three features of five generations of computers.

A: Any three from

Criteria	Generation				
	First	Second	Third	Fourth	Fifth
Technology	Vacuum Tube	Transistor	IC	Microprocessor	Artificial Intelligence
Operating System	None	None	Yes	Yes	Yes
Language	Machine	Assembly	High level	High level	High level
Period	1940-56	1956-64	1964-71	1971-Present	Present and Future

19. Write notes on:

a) ASCII

ASCII stands for American Standard Code for Information Interchange. It uses 8 bits for character representation. A unique number binary number is assigned to each character in this method. E.g. ASCII code of A = 1000001

b) Sign Magnitude

In this method of number representation, the left most bit is used for sign (+ve or -ve). If the left most bit is zero, then the number is positive. If the left most bit is one, then the number is negative.

c) Unicode.

Unicode is also used for character representation. It is developed by Unicode consortium. It is basically a 16 bit code. It can represent all written languages in the world.

20. Fill in the blanks..

a) $(______)_{10} = (11001)_2$

A: 25

b) $(0.625)_{10} = (\text{—————})_2$

A: 0.101

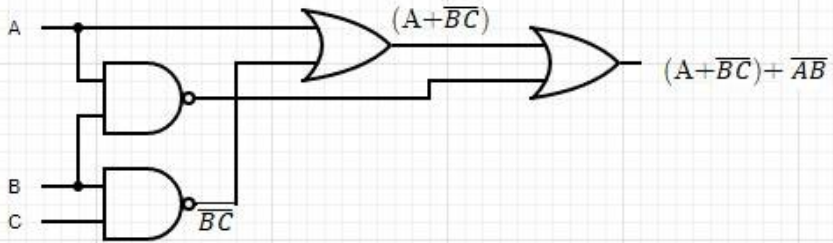
c) $(AB)_{16} = (______)_2$

A: 10101011

21. Draw a logic circuit for the following expression.

$$(A + \overline{BC}) + \overline{AB}$$

A:



22. Explain any 3 types of Language Processors.

A: a. Assembler

Assembler converts assembly language program to machine language. Assembler is machine dependent

b. Interpreter

Interpreter converts High level program to machine language line by line. If there is an error in one line, it reports the error and stops execution.

c. Compiler

Compiler converts high level program to machine language. It compiles the entire program and reports, the list of errors.

23. Explain any 3 types of ROM.

A:

a. PROM – Programmable ROM can only programmed when manufacturing.

b. EPROM – Erasable Programmable ROM can be erased and re-write using ultra-violet radiation and special circuits.

c. EEPROM – Electrically Erasable Programmable ROM can be erased and rewritten electrically.

24. Explain any three e-waste disposal methods.

A: Any three from

1. Reuse

It refers to second-hand use or usage after the equipment is modified. Used equipments are passed to relatives or exchanging for money or passed on to charity institutes.

2. Incineration

It is a complete combustion process. The waste is burned in specially designed incinerators at a high temperature in the range of 900 to 1000 degree Celsius.

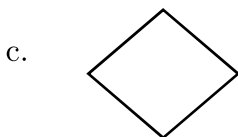
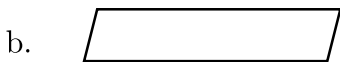
3. Recycling

It is the process of making new products from old products. Monitors, keyboards, hard drivers, CDs, mobiles, printers, CPUs, memory chips etc. can be recycled.

4. Land filling

It is one of the most widely used methods. In this method soil is excavated and waste material is buried in it, which is covered by a thick layer of soil.

25. Identify and explain the following symbols in flowchart.



A:

a. Rectangle is used for process.

b. Parallelogram is used for input or output.

c. Rhombus is used for decision making.

26. Define the different types of errors that are encountered during the compilation and running of a program.

A: Syntax errors occur when the rules (syntax) of the language are not followed. For example, not using semicolon at the end of a statement is a syntax error.

Logical errors occur when the programmer makes a logical mistake. For example, placing * instead of + is a logical error.

Run-time errors occur during run time, such as dividing by zero.

27. Consider the following algorithm and answer the following questions.

Step 1: Start

Step 2: $N=2, S=0$

Step 3: Repeat Step 4, Step 5 while $N \leq 10$

Step 4: $S = S+N$

Step 5: $N = N+2$

Step 6: Print S

Step 7: Stop

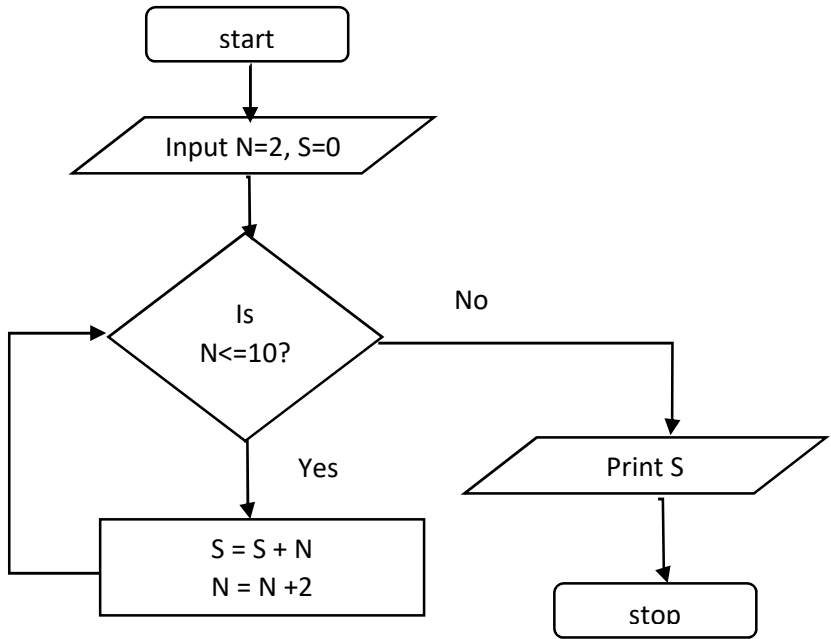
a) Predict the output of the above algorithm.(1)

b) Draw a flowchart for the above algorithm.(2)

A:

a) 30 (sum of even numbers up to 10)

b)



28. Find the invalid identifier names from the following and state the reason for invalidity.

A1, d-w, D9, 9D, _9F, Z\$w

A:

d-w : The character – is not allowed

9D: First character should not be a number

Z\$w: The character \$ is not allowed

Answer any two questions from 29 to 31. Each carries 5 Scores. (2×5 = 10)

29. What is meant by a Number System? Explain the different types of Number Systems.

A number system is a system representing numbers. There are four types of number systems namely Decimal, Binary, Octal and Hexadecimal. The number of symbols (digits) used in a number system is called the **base** (radix) of the number system. We normally use decimal number system in our daily life. Computer uses Binary for processing. Octal and Hexadecimal systems are used to save memory and easier conversion to and from binary.

The table below shows the base and the digits used in each number system

Number System	Base	Digits
Decimal	10	0, 1, 2, 3, 4, 5, 6, 7, 8, 9
Binary	2	0, 1
Octal	8	0, 1, 2, 3, 4, 5, 6, 7
Hexadecima l	16	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F

30. Explain the features of any five input devices of a computer.

A:

1) Keyboard: It is used to input alphabets, numbers and other characters. Keyboard detects the key pressed and generates the corresponding ASCII code which can be recognized by the computer. Usually it consists of 101 to 105 keys.

2) Mouse: It is a pointing device to point and select objects from the screen. It is also used to draws pictures. Various types are ball, optical and laser.

- 3) Scanner: It is used to scan and digitalize images, documents etc.
- 4) Digital Camera: A digital camera allows taking pictures and videos and converting them into digital format.
- 5) Microphone: They help us to input sound to the computer. It translates the vibration in the air in to electric pulse.

31. Write an algorithm and draw the flowchart to find the sum of numbers from 1 to 100.

Step 1: Start

Step 2: Input N=100

Step 3: A = 1, S = 0

Step 4: Repeat steps 5 and 6 while A ≤ N

Step 5: S = S + A

Step 6: A = A + 1

Step 7: Print S

Step 8: Stop

