

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2024)

CLASS: B.TECH./ I.MSc.
BRANCH: CSE/AI ML/ECE/EEE/MATHS

SEMESTER : II
SESSION : SP/2024

SUBJECT: CS101 PROGRAMMING FOR PROBLEM SOLVING

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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|--------|---|-----|-------|
| Q.1(a) | List various responsibilities of an operating system. | [2] | 1 1 |
| Q.1(b) | Draw a block diagram of the computer system and explain its various components with special emphasis on storage. | [3] | 1 2 |
| Q.2(a) | Define the term algorithm and explain the characteristics of a good algorithm. | [2] | 1 1,2 |
| Q.2(b) | Write a pseudocode and draw the corresponding flow chart where multiple conditions are checked to categorize a person based on specified age as either child (<12 years), teenager (>=12 years but <19 years) or adult (>19 years). | [3] | 1 3 |
| Q.3(a) | Compute the value of x and y for the following expressions with their evaluation tree: (i) $x = !0 \ \ 4.0 + 2.0 \geq 3.0 - 2.0$ (ii) $y = 75 - 20 - 48/8 * 5 + 9 \% 2 + 10 > 2$ | [2] | 2 3 |
| Q.3(b) | Illustrate various programming errors in C with examples. | [3] | 3 2 |
| Q.4(a) | Illustrate the difference between prefix and postfix increment operator with examples. | [2] | 2 4 |
| Q.4(b) | Differentiate between nested if-else and switch-case statement with examples. | [3] | 2 4 |
| Q.5(a) | Write a C program to evaluate the equation, $sum = 1 + 1/2 + 1/3 + \dots + 1/n$ and display the sum to an accuracy of four decimal places. | [2] | 2 3 |
| Q.5(b) | How is the size of an initialized array $A [] = \{1, 2, 3, 4, 5\}$ computed? Write a program in C to compute and display average and sum of squares of an array of real data supplied by the user. | [3] | 2 3 |

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