

*PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.*

**NOTE:**

- Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.
  - Parts of a question should be answered at the same place.
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- Q.1**
- Define the terms: Keyword, Identifier, Variable and Constant.
  - What are Escape Sequences and their purpose?
  - What are different types of Linked List?
  - Write the algorithm for deleting an element from One-Dimension Array.
  - What are the advantages and disadvantages of Linked List?
  - Write a program to print the ASCII value of a character.
  - Write a program to swap two numbers using a temporary variable. (7 × 4)
- Q.2**
- What are the ways for the Implementation of Stack and compare them properly. (6)
  - Write a program to find largest of two numbers using ternary operator. (6)
  - Write a program that displays the size of every data type. (6)
- Q.3**
- The following sequence gives the preorder and in-order of Binary Tree T:  
Preorder: A B D G C E H I F  
In-order: D G B A H E I C F  
Draw the diagram of the tree. And write the Post-order. (5)
  - Write a program to read and display the information of a student using a nested structure. (5)
  - Explain the different methods of traversing a Binary Tree with explanation and example. (8)

- Q.4** a. Convert the expression  $A * B + C / D$  to postfix form. Write the Dijkstra's Algorithm. (9)
- b. How does dynamic memory allocation help in managing data? Write a program to find whether the given number is an Armstrong number or not. How does variable declaration affect memory allocation? (9)
- Q.5** a. Discuss the following terminology: 1. Directed Graph 2. Undirected Graph 3. Weighted Graph. Write a program to enter any character. If the entered character is in lower case then convert it into upper case and if it is a lower case character then convert it into upper case. (9)
- b. Write a program using do-while loop to display the square and cube of first n natural numbers. Convert the expression  $A * (B + C * D) + E$  to postfix. (9)
- Q.6** a. Which data structure is used to perform recursion? Discuss it. For  $A / B ^ C - D$  give prefix expression. (9)
- b. Discuss the traversal of Binary Tree with their algorithms. Explain the basic operations that are performed on data structures. (9)
- Q.7** a. What are the different types of Sorting Techniques and their complexities? (9)
- b. Write a program to enter a binary number. Calculate and display the decimal equivalent of this number. (9)