

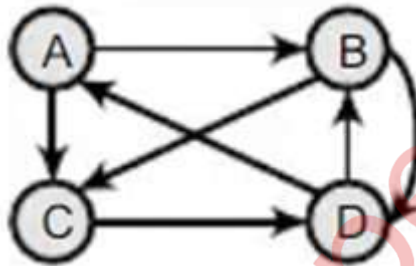
Duration: 3hrs

[Max Marks:80]

- N.B. : (1) Question No 1 is Compulsory.
 (2) Attempt any three questions out of the remaining five.
 (3) All questions carry equal marks.
 (4) Assume suitable data, if required, and state it clearly.

1 **Attempt any FOUR** [20]

- a List different data structures along with one application?
 b Find adjacency matrix A and adjacency list for the following directed graph.

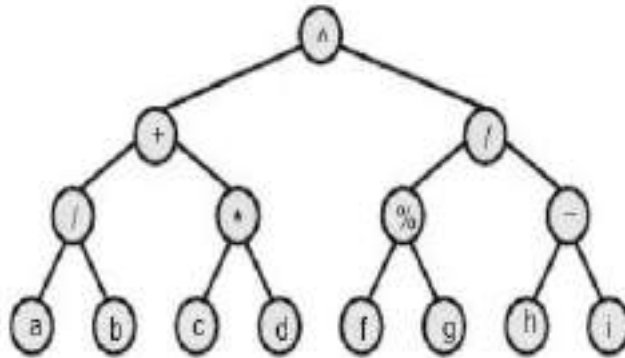


- c Compare between Bubble sort and insertion sort with an example.
 d Convert following expression to postfix
 $(f-g)*((a+b)*(c-d))/e$
 e Explain types of queues with examples?
- 2 a Write a program in 'C' language for quick sort algorithm? [10]
 b Explain the properties of Binary Search Tree. Create a binary search tree using the following data elements: [10]
 45,28,34,63,87,76,31,11,50,17
- 3 a Explain possible operations on doubly linked list and write algorithm to display list? [10]
 b Explain stack overflow and underflow conditions with suitable example? [10]
- 4 a Write an algorithm to check the well-formedness of parenthesis? [10]
 b Explain Singly linked list? State advantages and applications of Linked List? [10]
- 5 a Explain how element 29 can be searched in the given array using the Binary search algorithm. Write algorithm for the same. [10]
 5, 9, 11, 15, 25, 29, 30, 35, 40.
 b Write a function in C for DFS traversal of graph. Explain DFS graph traversal with suitable example? [10]

6 Attempt ALL

[20]

a Write down the expression that it represented by following binary tree.



b What is hashing? Explain hash collision with example?

c List practical applications of stack and queues?

d Differentiate between static arrays and dynamic arrays.
