

B.C.A. (Part-III) Examination, 2017

[Time: Three Hours]

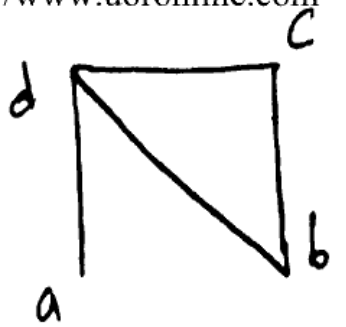
[Maximum Marks: 100]

Part - I

1. a) What is a LIFO?
- b) What is a dequeue?
- c) What are the notations used in evaluation of arithmetic expressions using prefix and postfix form?
- d) In tree construction which is the suitable efficient data structure?(Array, Linked List, Stack, Queue)
- e) Whether linked is linear or non-linear data Structure.
- f) What is doubly linked list?
- g) What is extended binary tree?
- h) What is connected graph?
- i) What is Linear Search?
- j) What is the time complexity of quick sort algorithm?

Part - II

2. Explain the different operations to be performed on the data structures.
3. Discuss the advantages, if any of a two-way list over a one way list for each of the following operations:
 - a) Deleting a node whose location POS is given.
 - b) Traversing the list of process each node.
4. Draw all possible binary tree T, with 3 nodes.
5. Find the number of spanning trees in the following graph:



6. Explain the time complexity of bubble sort algorithm.

Part - III

7. What do you mean by Stack? Write an algorithm in C to perform PUSH and POP operations.

OR

What is circular queue? Write an algorithm in C for insertion and deletion in Queue.

8. Convert $X : A + (B * C - (D / E - F * G) * H)$ into postfix form showing stack status after every step in tabular form.

OR

Write an algorithm to insert a number in the linked list at the following positions:

- a) In the beginning of the list.
- b) Inserting a new node at the specified positions.
- c) At the end of the list.

9. A binary tree T has 9 nodes. The inorder and preorder traversals yield the following sequence of nodes:

Inorder : E A C K F H D B G

Preorder : F A E K C D H G B

Draw the tree T.

OR

Write an algorithm for each of the following :

- a) Inorder binary tree traversal.
- b) Preorder binary tree traversal.
- c) Postorder binary tree traversal.

10. Explain the shortest path algorithm with suitable example.

OR

Explain the breadth first traversal algorithm with example.

11. Explain the selection sort algorithm with example.

OR

What is the pre-requisite for the binary search? Explain the binary search algorithm.