

Roll No. :

Total No. of Questions : 11]

[Total No. of Printed Pages : 3

SB-381

B.C.A. (Part-III) Suppl. Examination, 2021

DATA STRUCTURE

Paper - BCA-302

Time : 1½ Hours]

[Maximum Marks : 70

Section-A

(Marks : 2 × 10 = 20)

Note :- Answer all *ten* questions (Answer limit **50** words). Each question carries **2** marks.

Section-B

(Marks : 4 × 5 = 20)

Note :- Answer all *five* questions. Each question has internal choice (Answer limit **200** words). Each question carries **4** marks.

Section-C

(Marks : 10 × 3 = 30)

Note :- Answer any *three* questions out of five (Answer limit **500** words). Each question carries **10** marks.

Section-A

1. (i) What is Dequeue ?
- (ii) Convert the following infix expression into postfix form
(A + B) * (C + D) * (E/F).
- (iii) Write algorithm in the singly linked list in insert a node at the beginning.
- (iv) What are operations on linked list ?

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- (v) Draw a binary tree for the following expression $(A*B) - (C-D)*(P/Q)$.
- (vi) Find preorder in tree :
- Inorder : 8, 15, 20, 30, 35, 43, 50, 60, 70, 62
- Postorder : 8, 20, 35, 30, 15, 50, 70, 82, 60, 43
- (vii) What is Searching ?
- (viii) What is linear search in time complexity are best case and average case ?
- (ix) Define isomorphic graph.
- (x) Define weighted graph.

Section-B

2. What is Recursion ? Give the application of recursion with program.

Or

Write an algorithm to add a new element of information to a circular queue.

3. Compare between singly linked list and doubly linked list.

Or

Explain linked representation of stack.

4. Write an algorithm to insert and delete in item from a binary search tree.

Or

Discuss the difference between a general tree and a binary tree. What is a complete binary tree ?

5. Explain quick sort algorithm. What is the complexity of this algorithm ?

Or

How is the heap sort similar to the selection sort and the insertion sort ?

6. Distinguish between DFS and BFS.

Or

What are Graphs ? Give the various representation of graphs.

Section–C

7. What is Stack ? Explain any *two* operations performed on a stack with required algorithms.
8. Explain the structure of a doubly linked list. Write a general algorithm for inserting and deleting nodes in the middle.
9. Explain a height balanced binary tree.
10. Trace by hand the sorting of this array :
44, 88, 55, 99, 66, 33, 22, 88, 77
 - (i) bubble sort
 - (ii) insertion sort
11. What is a spanning tree ? Present algorithms to obtain the spanning trees for a graph. Illustrate them with example.