



**2021/TDC/CBCS/ODD/
BCACC-301T/017**

**TDC (CBCS) Odd Semester Exam., 2021
held in March, 2022**

COMPUTER APPLICATION

(3rd Semester)

Course No. : BCACC-301T

(Data Structures)

Full Marks : 50

Pass Marks : 20

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

SECTION—A

Answer any *ten* questions :

2×10=20

1. Define sparse matrix with an example.
2. Write down the limitations of array.
3. Define stack. Also write its application.



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4. State the differences between linear queue and circular queue.
5. What do you mean by 'self-referential structure' of creating a linked list? Give example.
6. Define dequeue. Give example.
7. Write down the properties of a tree.
8. Define AVL tree.
9. Write the advantages of using recursion over iteration.
10. Give an example of shell sort.
11. Write down the limitation of binary search.
12. Find the time complexity of bubble sort algorithm.
13. What do you mean open-hashing and closed-hashing?
14. Write the uses of hash key in hashing.
15. Discuss one collision resolution technique in hashing.

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(Continued)

(3)

SECTION—B

Answer any five questions : 6×5=30

16. Write down the algorithm of evaluation of postfix expression.
17. Convert the following infix expression into its equivalent postfix expression :
$$8 + (((7 - 5) * (9 - 4) + 6) / 4)$$

Also show the stack position in each case.
18. Write down the algorithm of implementation of different operations of queue using linked list.
19. Write down the algorithm of delete a last node from linked list.
20. Show the tree after inserting the following integers in sequence into an initially empty binary search tree (BST) :
$$18 \ 6 \ 20 \ 25 \ 32 \ 8 \ 12 \ 16$$

Also show the BST after deleting the root from the above BST.
21. Construct a binary tree, given the pre-order and in-order sequences as below :
Pre-order : a b c e i f j d g h k l
In-order : e i c f j b g d k h l a

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(Turn Over)



(4)

22. Write down the algorithm of selection sort. Also write its time complexity.

23. Sort the given array of elements using insertion sort algorithm :

A [16 14 10 8 7 9 3 2 4]

24. Discuss the various techniques for generating hash functions.

25. Define the following terms : 2×3=6

(a) Hash function

(b) Hash table

(c) Closed addressing
