

B.Tech. (CSBS) (CBCS - 2018 COURSE) Sem - II: WINTER- 2019
SUBJECT: DATA STRUCTURES & PROBLEM SOLVING



Wednesday 06/11/2019
10:00 AM 01:00 PM

W-2019-3586
Max. Marks: 60

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data if **NECESSARY**.

Q.1 What is data abstraction? Elaborate the significance and implementation of data abstraction. (10)

OR

Q.1 Define algorithm. List and explain the characteristics of algorithms. (10)

Q.2 State the drawbacks of single linked list. How does double linked list overcome those? Explain insertion in double linked list. (10)

OR

Q.2 Define stacks. Explain the operations on stacks with its algorithms. How does stack help achieve recursion? Evaluate the following postfix expression (10)

$34 \ 62 \ + \ 4 \ 3 \ * \ /$

Q.3 Define Binary Search Tree. How to locate an element in a Binary Search Tree? Elaborate with an algorithm and suitable example. (10)

OR

Q.3 Insert the following sequence of elements into an AVL tree, starting with an empty tree (10)

10, 20, 15, 25, 30, 16, 18, 19

Then delete 30 in the resulting AVL tree and redraw the final AVL tree.

Q.4 What are the different ways to represent a graph? Give the suitable example and explain each of them. Explain in detail any application of graphs in the area of Computing. (10)

OR

Q.4 What is Breadth First Traversal of graph used for? State its algorithm with example. Discuss its complexity. (10)

Q.5 What are the advantages of sorting data? Explain the procedure for insertion sort with an example and compare it with selection sort. (10)

OR

Q.5 Consider following numbers: (10)

40, 21, 80, 54, 2, 11, 55, 95, 32, 12, 9, 15, 66, 55

For the above numbers, apply necessary procedure and explain the comparisons done using binary search in order to search 28, 12, 29 in the given input.

Q.6 Write short notes on : (10)

- i. Sequential File Organisation
- ii. Direct Access File – Concepts and Primitive operations
- iii. Indexed Sequential File Organisation

OR

Q.6 What are hash tables? Why are they required? List and explain the different Hash functions used for storing data into hash tables. (10)

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