MAY 2023 **P/ID 17605/PCA2D**

Time : Three hours Maximum : 80 marks

PART A — (10 × 2 = 20 marks)

Answer any TEN questions.

1. What is an abstract data type?

2. What is Omega Notation?

3. List any three applications of linked list.

4. List the advantages of circular linked list over single linked list.

5. Write the following infix expression in prefix notation:

   (A–B/C) * (D*E–F)

6. What are the applications of trees?

7. Define the term minimum cost spanning tree.

8. Define the term weighted graph.

9. What is meant by sorting data?

10. What do you mean by internal sorting?

11. Define the term double hashing.

12. What are the properties of Red-Black Tree?

PART B — ($5 \times 6 = 30$ marks)

Answer any FIVE questions.

13. Write short notes on ordered list.

14. How a circular queue is represented using an array. Write down the QUEUE FULL condition for a circular queue.

15. Given a singly linked list, write an algorithm that removes a node with a particular value from the list and inserts it in the front.

16. Illustrate the process of finding the minimum and maximum elements of the binary search tree.

17. Write algorithms for DFS and BFS traversal on a graph.

18. How do you find optimal sorting time? Explain.

19. Explain in detail about B-Tree with suitable example.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

20. What is an array? Discuss different representation of array with examples.

21. Assume that a stack is represented using linked list. Write algorithms for the following operations:

    (a) Push (b) Pop

22. Discuss the various representation of binary tree.

23. Discuss in detail about sorting with tapes.

24. Discuss how to insert and delete an element in a AVL tree and explain with algorithm.

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