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(FOR THE CANDIDATES ADMITTED
DURING THE ACADEMIC YEAR 2023 ONLY)

23UBC102

REG.NO. :

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS : NOVEMBER-2023

COURSE NAME: B.C.A **MAXIMUM MARKS: 75**

SEMESTER: I **TIME : 3 HOURS**

PART - III
DATA STRUCTURES

SECTION – A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS. (K1)

1. In general, the index of the first element in an array is _____.

   (a) 0 (b) 1

   (c) -1 (d) 2

2. A binary tree whose every node has either zero or two children is called _____.
   (a) Complete binary tree (b) Binary search tree
   (c) Extended binary tree (d) None of the above

3. Kruskal algorithm is based on _____ method.
   (a) Divide and conquer method (b) Greedy method
   (c) Dynamic programming (d) Branch and bound

4. The knapsack problem where the objective function is to minimize the profit is _____.
   (a) Greedy (b) Dynamic 0 / 1
   (c) Back tracking (d) Branch and Bound 0 / 1

5. Which of the following technique is used by merge sort to implement sorting?
   (a) Back tracking (b) Divide and conquer
   (c) Greedy method (d) Dynamic programming

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES. (K2)

6. What is a Linear Data Structure? Give few examples.
7. What is Inorder traversal?
8. Define graph.
9. Give an example for backtracking method.
10. Give time complexity of quick sort.

SECTION – B (5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11. a) Describe an array and its representation.

(OR)

b) Compare stack and queue.

12. a) What is threaded binary tree? Explain with suitable diagram.

(OR)

b) Explain binary search tree with an example.

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13. a) Describe BFS algorithm with an example.

(OR)

b) Explain Dijkstra's shortest path algorithm.

14. a) Examine greedy method with an example.

(OR)

b) Solve the sum of subsets problem with an example.

15. a) Write a note on Insertion sort.

(OR)

b) List the steps used in the implementation of Linear Search.

SECTION – C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(K4 (Or) K5)

16. a) Examine the basic operations of stack data structure.

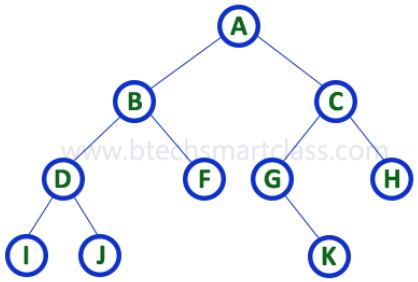
(OR)

b) Discuss on Circular Linked List.

17. a) Discuss on binary tree and its representation.

(OR)

b) Evaluate the below given tree using different tree traversal methods.



18. a) Categorize the representation of a graph in a data structure with an example.

(OR)

b) Construct a minimum spanning tree (MST) using Prim's algorithm.

19. a) Describe knapsack problem with suitable example.

(OR)

b) Summarise the Divide and conquer approach.

20. a) Discuss on Quick sort with an example.

(OR)

b) Discuss on Binary search with an example.

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