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(FOR THE CANDIDATES ADMITTED
DURING THE ACADEMIC YEAR 2022 ONLY)

22UBC102

REG.NO. :

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

END-OF-SEMESTER EXAMINATIONS: DECEMBER-2022

COURSE NAME: B.C.A MAXIMUM MARKS: 50

SEMESTER: I TIME: 3 HOURS

PART - III
DATA STRUCTURES

SECTION – A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.
MULTIPLE CHOICE QUESTIONS. (K1)

1. In queue, Front=Rear, how many elements are available in queue?

   a) 2 b) 5 c) 0 d) 3

2. What is the maximum number of children that a binary tree node can have?

   a) 0 b) 1 c) 2 d) 3

3. A graph with all vertices having equal degree is known as a _____

   a) Multi Graph b) Regular Graph c) Simple Graph d) Complete Graph

4. Which of the problems cannot be solved by backtracking method?

   a) N-queens problem b) Subset sum problem
   c) Hamiltonian circuit problem d) Travelling salesman problem

5. Which of the following sorting algorithm is of divide and conquer type?

   a) Bubble sort b) Insertion sort
   c) Merge sort d) Selection sort

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

6. How is array differ from variable?
7. Define the term siblings.
8. Differentiate cyclic and acyclic graph.
9. What is meant by feasible solution?
10. Comment on heapify in heap sort.

SECTION – B (5 X 3 = 15 MARKS)

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

11. a) Interpret the concept of array and its operations.

    (OR)

    b) List out the various operations of queue and explain

12. a) Describe the concept of threaded binary tree with example.

    (OR)

    b) Examine the concept of binary tree with suitable example.

13. a) Differentiate between the Depth First Search and Breath First Search.

(OR)

b) Construct the minimum spanning tree by using Kruskal's algorithm.

14. a) Explain the sum of subset problem and its solution.

(OR)

b) Elaborate a note on travelling salesperson's problem and its solution.

15. a) Explain binary search with suitable example.

(OR)

b) Analyze linear search in terms of time complexity.

SECTION – C (5 X 5 = 25 MARKS)

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

(K4 (Or) K5)

16. a) Write an algorithm for PUSH and POP operations on stack.

(OR)

b) Categorize and implement the the different types of linked list.

17. a) Summarize the concept of binary tree traversal with examples.

(OR)

b) Classify the various types of binary tree representation with examples.

18. a) Evaluate the matrix representation of graph.

(OR)

b) Demonstrate the shortest path Dijkstra algorithm.

19. a) n=3, m=20, (P1,P2,P3)=(25,24,15) and (W1,W2,W3)=(18,15,10)
Where n is a number of objects, m is a capacity, **P** is a profit and **W** is a weight.
Find the feasible solution of the knapsack problem using algorithm.

(OR)

b) Analyse the 8-Queen problem and solve it using backtrack.

20. a) Discuss the concepts of quick sort with an example.

(OR)

b) Develop algorithm for merge sort with an example.

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