

**NGM COLLEGE (AUTONOMOUS) POLLACHI**

**END-OF-SEMESTER EXAMINATIONS: DECEMBER- 2022**

**M. Sc - Computer Science**

**MAXIMUM MARKS: 50**

**I SEMESTER**

**TIME: 3 HOURS**

**DESIGN AND ANALYSIS OF ALGORITHMS**

**SECTION – A (10 X 1 = 10 MARKS)**

**ANSWER THE FOLLOWING QUESTIONS.**

**(K1)**

1. Compound data types can be formed with \_\_\_\_\_
  - a) File
  - b) Records
  - c) Memory
  - d) Field
2. \_\_\_\_\_ strategy splits the input into two sub problems.
  - a) Divide and Conquer
  - b) Backtracking
  - c) Dynamic Programming
  - d) Branch and Bound
3.  $O(2n)$  means computing time is \_\_\_\_\_
  - a) Constant
  - b) Quadratic
  - c) Linear
  - d) Exponential
4. What is the type of the algorithm used in solving the 8 Queens problem?
  - a) Greedy
  - b) Dynamic
  - c) Backtracking
  - d) Branch and Bound
5. Which data structure is used for implementing a FIFO branch and bound strategy?
  - a) stack
  - b) queue
  - c) array
  - d) linked list

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

**(K2)**

6. What is a recursive function?
7. What is a Greedy method?
8. What is dynamic programming?
9. Define Backtracking.
10. What is Branch and Bound?

**SECTION – B (5 X 3 = 15 MARKS)**

**ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.**  
**(Qn. No. 11 to 15 Questions for Short Answers with internal choices) (K3)**

11. a) Describe the Trees.  
**(OR)**  
 b) What are priority queues?
12. a) What is a Binary Search?  
**(OR)**  
 b) Describe the Prim's algorithm for minimum cost spanning tree.
13. a) What is flow shop scheduling?  
**(OR)**  
 b) Elucidate Multi stage graphs.
14. a) Describe Graph coloring.  
**(OR)**  
 b) Discuss the sum of subsets problem.
15. a) Illustrate Least cost search using branch and bound method.  
**(OR)**  
 b) Describe the FIFO branch and bound method.

**SECTION – C (5 X 5 = 25 MARKS)**

**ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.**  
**(Qn. No. 16 to 20 Questions for Long Answers with internal choices) (K4 (Or) K5)**

16. a) Discuss Breadth First Search Traversal in detail.  
**(OR)**  
 b) What are the stack operations? Explain.
17. a) Explain the Merge sorting in detail.  
**(OR)**  
 b) How will you solve a single source shortest path problem using divide and conquer method?
18. a) Explain all pairs shortest paths algorithm in detail.  
**(OR)**  
 b) How will you solve a Traveling salesman problem using dynamic programming?
19. a) Discuss the 8-Queens problem in detail.  
**(OR)**  
 b) What is a Hamiltonian cycle? Explain.
20. a) Discuss the control abstractions for LC search in detail.  
**(OR)**  
 b) How will you solve a 15 puzzle problem using branch and bound method?