D.K.M.COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE-1.

DESIGN AND ANALYSIS OF ALGORITHM

UNIT- I SECTION-A 2 MARKS

1. Define an algorithm?
2. Specify the criteria of algorithm?
3. What is Computational Procedure?
4. How to validate an algorithm?
5. How to devise an algorithm?
6. Define Space Complexity?
7. Define Time Complexity?
8. What is Big –oh Notation?
9. What is Big –Omega Notation?
10. What is Big –Theta Notation?
11. What is Recursion?
12. Define Input Size?
13. Differentiate Space and Time Complexity?
14. What is Asymptotic Notation?

SECTION-B 5 MARKS

15. How to validate and analyze Algorithm?
16. Explain Space Complexity of an Algorithm with an Example?
17. Explain Time Complexity of an Algorithm with an Example?
18. Explain the Characteristics and performance of an Algorithm?
19. Explain an algorithm with the concept of Recursion?
20. Explain Asymptotic Notation in detail?

SECTION-C 10 MARKS

21. Discuss about Pseudo code Conventions in algorithm specification with an example?
22. Discuss in detail about Time and Space Complexity with examples?
23. Explain about Asymptotic Notations along with its types with suitable

examples.

24. Write an algorithm for finding Maximum element of an array. Perform Best and Average Case Complexity with appropriate order notations

25. Derive the recurrence relation for Fibonacci Series. Perform Complexity Analysis for the same.

26. Explain in detail about Linear Search with an Example. Discuss the Time and Space Complexity of this search.

UNIT II SECTION-A TWO MARKS

1. What is Divide and Conquer Strategy?
2. Define Maximum and Minimum of algorithm
3. What is Merge Sort?
4. What is Quick Sort?
5. Define Greedy Algorithm?
6. What is Feasible Solution?
7. Define Optimality of an Algorithm?
8. What is knapsack Problem?
9. Define Control Abstraction.
10. List any two drawbacks of Binary Search Algorithm?
11. What are the advantages of DAndC algorithm?
12. List out the advantage and disadvantages of MergeSort?
13. What is the Computing time of DAndC Algorithm

SECTION-B 5 MARKS

14. Write the algorithm for Recursive finding the maximum and minimum.
15. Write the algorithm for Merge Sort
16. Solve the Quick Sort Algorithm with an example
17. Define the Knapsack Problem with appropriate example

SECTION-C 10 MARKS

18. Discuss about Quick Sort Algorithm with appropriate example
19. Solve the Merge Sort Problem with an example. Discuss the algorithm
20. Define Greedy Method of Divide and Conquer. Discuss with an example
21. Discuss about the maximum and minimum algorithm with an example

UNIT III SECTION-A 2 MARKS

1. What is Multi-Stage Graph?
2. Write the Formula for Forward and Backward Approach.
3. Define Directed Graph and draw the Graph
4. What is Index?
5. Define String?
6. Define Dynamic Programming.
7. What is TSP?
8. Write the Recurrence Equation?
9. What is the Principle of Optimality?
10. Write the formula for String Editing.
11. List out the different ways String Editing.
12. Define Optimal Binary Search Tree.

SECTION-B 5 MARKS

13. Discuss about the Forward approach in Multi stage graph.
14. Discuss about the Backward approach in Multi stage graph
15. How you will construct an Optimal Search tree? Explain with an example.
16. Solve the All pair Shortest Path Problem with an example.
17. Discuss about TSP in brief
18. Discuss about the concept of Dynamic Programming.

SECTION-C 10 MARKS

19. Explain in detail about Multi-Stage Graph.
20. Explain in detail about Knapsack Problem with an example.
21. Discuss how to solve Traveling Salesman problem using Dynamic Programming Approach with an example.

UNIT IV SECTION-A 2 MARKS

1. What is M-Color Optimization?
2. Define Sum of Subsets?
3. What is Chromatic Number?
4. Define Backtracking.
5. What are the applications of Backtracking?
6. Define n-queens Problem.
7. Define Hamilton circuit problem in an undirected graph.
8. What is State-Space Tree?
9. What is Explicit and Implicit Constraint Specification?
10. Define Graph Coloring.
11. Define E-node, Live node .
12. Define Graph & Planar.

SECTION-B 5 MARKS

13. Discuss about Sum of Subsets
14. Discuss about Graph Coloring using Backtracking
15. What is recursive backtracking algorithm for sum of subsets? Explain.
16. Write an algorithm for M-Coloring.

SECTION-C 10 MARKS

17. Explain in detail about 8 –Queens Problem.
18. Explain Sum of Subsets Algorithm with an example
19. Discuss about Graph Coloring and its algorithm with an example.
20. Discuss about the general method for Backtracking with an example.

UNIT V SECTION-A 2 MARKS

1. What is Least Cost Search Method?
2. What is Branch and Bound Technique?

3. Define FIFO and LIFO method.
4. Define Bounding Problem.
5. What is Minimum Spanning Tree?
6. Define BFS and DFS
7. Define Deterministic Algorithm.
8. Define Non-Deterministic Algorithm.

SECTION-B 5 MARKS

9. Compare and Contrast Backtracking with Branch and Bound Technique
10. Discuss about Least Cost Search Method briefly
11. Explain FIFO Branch and Bound Technique

SECTION-C 10 MARKS

12. Discuss about the general method for Branch and Bound Technique
13. Solve the FIFO Branch and Bound Problem with an example
14. Explain in detail about LC-Search problem.

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SEMESTER EXAMINATION – QUESTION PAPER MODEL

DESIGN AND ANALYSIS OF ALGORITHM

Time : 3 Hours **Max. Marks :75**

SECTION –A (10 X 2 =20)

Answer ALL the questions.

1. What is an Algorithm?
2. Write Control Abstraction for Subset Paradigm.
3. Give Control abstraction for Divide and Conquer Method.
4. Define Subset Paradigm
5. Define general method for Dynamic Programming.
6. Define Static- trees.
7. Define E-node.
8. Explain Branch and Bound Techniques.
9. List out the Operations available in String Editing
10. Define Backtracking.

SECTION –B (5 X 5 =25)

Answer any FIVE of the following questions:-

1. Define the Characteristics of an Algorithm.
2. Explain Traveling Salesman Problem in Dynamic Programming?
3. Explain Greedy Strategies for the Knapsack Problem.
4. Explain Multistage Graph problem with an example.
5. How to tackle the 8 Queen's Problem in Back Tracking?
6. Discuss about FIFO Branch and Bound Solution.
7. Explain String Editing with an Example.
8. Write a note on Asymptotic Notations

SECTION –C (10 X 3 =30)

Answer ALL the questions:-

1. (a) Discuss about Job Sequencing with Deadline.

(OR)

(b) Explain in detail about Space and Time Complexity.

2. (a) Discuss about Least Cost Search Method.

(OR)

(b) Explain in detail about Sum of Subsets.

3. (a) Explain Graph Coloring Method with an Example

(OR)

(b) Explain Quick Sort with an Example

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