

**GS-652**

26

VI Semester B.C.A. Examination, May/June 2019

COMPUTER SCIENCE**601 : DESIGN AND ANALYSIS OF ALGORITHMS**

(2K8 Scheme)

Time : 3 Hours

Max. Marks : 100

Instructions : Answer **all** sections**SECTION - A**

- I. Answer **any ten** questions. Each carries **two** marks. **10x2=20**
1. Define Algorithm. Mention the characteristics of algorithm.
 2. List the different types of control structures.
 3. Write the control abstraction of greedy method.
 4. Mention the best case and worst case time complexities of Linear Search Algorithm.
 5. What is Knapsack problem ?
 6. What is Minimum Spanning Tree ?
 7. Mention the different types of sorting techniques.
 8. What is flow shop scheduling ?
 9. Define Directed Graph and Cycle.
 10. Mention tree traversal methods.
 11. Define Binary Tree and Complete Binary Tree.
 12. What is graph coloring ?

P.T.O.



SECTION - B

II. Answer **any five** questions. Each carries **five** marks.

5x5=25

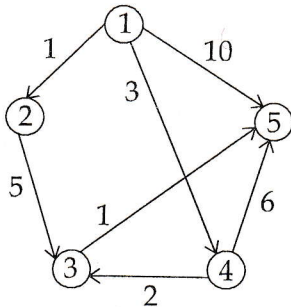
13. Illustrate asymptotic notations.
14. Explain time and space complexity of an algorithm with an example.
15. Write the advantages and disadvantages of divide and conquer technique.
16. Compare DFS and BFS.
17. Write Kruskal's algorithm to obtain minimum cost spanning tree with example.
18. What is dynamic programming ? Mention the difference between divide and conquer and dynamic programming.
19. What are the different strategies to solve Knapsack problem ? Mention its constraints.
20. Explain 4-queen's problem.

SECTION - C

III. Answer **any three** questions. Each carries **fifteen** marks.

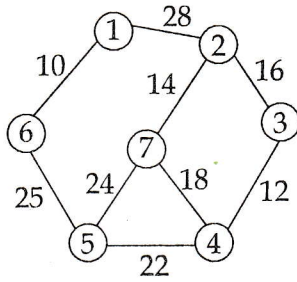
3x15=45

21. (a) Write an algorithm for finding Maximum and Minimum and find the time complexity. **8**
 (b) Trace for the MaxMin element for the following data **7**
 90, 67, 34, 88, 94, 40.
22. Write the algorithm for Merge Sort and Trace for the data **15**
 38, 27, 43, 3, 9, 82, 10.
23. Find the shortest path from node 1 to all other nodes using Dijkstra's algorithm. **15**

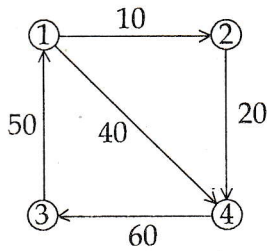




24. Find the minimum spanning tree using Kruskal's algorithm.



25. Determine all pairs shortest paths for the weighted graph.



SECTION - D

IV. Answer **any one** question. Each carries **ten** marks.

1x10=10

26. Write the algorithm for the following :

- (i) Pre-order Tree Traversal
- (ii) Inorder Tree Traversal
- (iii) Post-order Tree Traversal

27. Write short notes on :

- (i) BFS and DFS
- (ii) N-queen's Problem
- (iii) Graph Coloring