25092

M.Sc. DEGREE EXAMINATION, APRIL 2018.

Computer Science

SECOND SEMESTER

Paper II — COMPUTER ALGORITHMS

Time : Three hours Maximum : 75 marks

(No additional sheet will be supplied)

PART A — (5 × 3 = 15 marks)

Answer any FIVE questions.
Each question carries 3 marks.
Each answer should not exceed 1 page.

1. Compare the performance of insertion sort versus merge sort.

2. Write a brief note on convex hull.

3. Describe the general method of dynamic programming.

4. Give an introduction to 0/1 knapsack problem.

5. Differentiate between the FIFO and LC branch, and bound.

6. Describe the FIFO and LC solution for the 0/1 knapsack problem.

7. Differentiate between NP hard and NP complete problems.

8. Write a note on the absolute and c-approximations of lower bound theory.

PART B — (4 × 15 = 60 marks)

Answer ONE question from each Unit.
Each question carries 15 marks.
Each answer should not exceed 6 pages.

9. Write Strassen's algorithm for matrix multiplication.

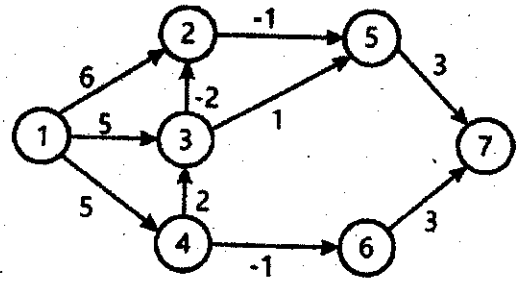
Or

10. Write the algorithm for quick sort. Derive the worst-case time efficiency of the algorithm.

11. Write Dijkstra's algorithm for single source shortest path problem on weighted directed graph.

Or

12. Using dynamic programming, compute the shortest path from vertex 1 to all other vertices.



13. Solve sum of subsets problem for following N = 6 W = {3, 5, 7, 8, 9, 15} & M = 20. Also write the Algorithm for it.

Or

14. Define spanning tree? Write Kruskal's algorithm for finding minimum cost spanning tree. Describe how Kruskal's algorithm is different from Prim's algorithm for finding minimum cost spanning tree.

15. Explain with illustration the P, NP hard and NP complete problems.

Or

16. Explain about the various polynomial time approximations schemes.