



Code No. : 5292/M

FACULTY OF INFORMATICS
B.E. 3/4 (IT) II Semester (Main) Examination, May/June 2012
DESIGN AND ANALYSIS OF ALGORITHMS

Time: 3 Hours]

[Max. Marks : 75

Note : Answer *all* questions from Part A. Answer *any five* questions from Part B.

PART – A

25

1. Define Heap. 2
2. Explain Union and find operations. 3
3. Define optimal solution. 2
4. Difference between Divide-and-Conquer and Dynamic Programming. 3
5. What is multistage graph ? 2
6. State travelling salesperson's problem. 3
7. Write the control abstraction of Lc-Search. 3
8. What is decision problem ? 3
9. What is branch and bound ? 2
10. Define NP hard-NP complete. 2

PART – B

(5×10=50 Marks)

11. a) What is an algorithm ? Explain time and space complexity of an algorithm. 5
b) Write about Asymptotic Notation. 5



12. a) What is Knapsack problem ? Explain. 3
- b) Find an optimal solution to the Knapsack instance $n = 3$, $M = 20$, $(P_1, P_2, P_3) = (25, 24, 15)$ and $(W_1, W_2, W_3) = (18, 15, 10)$. 7
13. a) Explain Reliability Design Problem. 4
- b) Write a recursive backtracking algorithm to find all the Hamiltonian cycles of a given graph. 6
14. a) Explain FIFO Branch and Bound. 5
- b) Explain graph coloring problem. 5
15. State and prove Cook's theorem. 10
16. a) Discuss in detail about the problem of job sequencing with deadlines. 4
- b) Write Prim's algorithm and explain with an example to find minimum spanning tree. 6
17. Write short notes on :
- a) Node covering problem. 4
- b) Single source shortest paths. 3
- c) Optimal binary search trees. 3