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