Code No.: **6359**

FACULTY OF INFORMATICS

B.E (III/IV Year) (IT) II Semester (Main) Examination, June 2010

DESIGN AND ANALYSIS OF ALGORITHMS

Time : 3 Hours]   [Max. Marks : 75

Answer all questions from Part A.
Answer any five questions from Part B.

Part A – (25 Marks)

1. Define Randomized algorithm.   3
2. What is knapsack problem?   2
3. Define feasible solution.   2
4. Define principle of optimality.   3
5. What is Depth First Search?   2
6. What is spanning tree of a graph?   3
7. Explain properties of LC – search.   3
8. What is graph coloring?   2
9. Define Hamiltonian cycles.   2
10. State Cook's theorem.   3

Part B – (Marks : 5 ×10 = 50)

11. a) Briefly explain how to analyse algorithm?   3

    b) What is heap? How to delete an element from heap?   7

12. a) What is greedy method? Give the control abstraction.   4

    b) Explain job sequencing with deadlines problem with an example. Give greedy
        solution?   6

13. What is multi–stage graph? Write dynamic programming expressions for forward
    approach and backward approach and explain with an example.   10

[P.T.O.

14. a) Explain Branch and Bound. Give LCBB solution for the following knapsack instance $n = 4$, $(P_1, P_2, P_3, P_4) = (10, 10, 12, 18)$, $(W_1, W_2, W_3, W_4) = (2, 4, 6, 9)$ and $m = 15$.   7

   b) Explain about biconnected component.   3

15. a) Explain NP hard graph problem and scheduling problem.   5

   b) Write short notes on non-deterministic algorithm.   5

16. a) Write an algorithm to find the shortest path from a single source in a graph. 5

   b) Explain Travelling sales person problem.   5

17. Write short notes on :

   a) UNON and FIND operations   2

   b) Optimal merge pattern.   4

   c) Lower bound theory.   4