

FACULTY OF ENGINEERING

B.E. 3/4 (IT) II Semester (Suppl.) Examination, December 2012

Subject: 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 Marks)

1. What is asymptotic notation? (3)
2. What are UNION, FIND operations? (3)
3. Define feasible solution. (2)
4. Define binary search. (2)
5. What is dynamic programming? (2)
6. What is biconnected component? (3)
7. What is 0/1 knapsack problem? (2)
8. Write the control abstraction for LC search. (3)
9. What is Node covering problem? (3)
10. State Cook's theorem. (2)

PART – B (50 Marks)

- 11.(a) Define heap – Explain heapsort with an example. (5)
(b) Explain Randomized algorithm. (5)
- 12.(a) Explain general method for finding maximum and minimum. (4)
(b) Explain minimum cost spanning tree with an example and can we generate more than one minimum cost spanning tree. Justify. (6)
- 13.(a) Explain reliability design problem with an example. (6)
(b) Explain optimal binary search tree. (4)
14. Briefly argue how principle of optimality holds for 0/1 knapsack problem. Generate the sets S^i , $0 \leq i \leq 4$ where $(w_1, w_2, w_3, w_4) = (10, 15, 6, 9)$ & $(p_1, p_2, p_3, p_4) = (2, 5, 8, 9)$ state the purging rules if knapsack capacity is $m = 25$. What is optimal solution. (10)
- 15.(a) Explain branch and bound. Give LCBB solution for the following knapsack instance. $n=4$, $m=15$
 $(p_1, p_2, p_3, p_4) = (10, 10, 12, 18)$
 $(w_1, w_2, w_3, w_4) = (2, 4, 6, 9)$ (7)
(b) what is lower bound theory. (3)
- 16.(a) What is non deterministic algorithm. (5)
(b) Explain decision problem. (5)
17. Write about
(a) Hamilton cycles (5)
(b) Single source shortest path. (5)