Code No. 6361 / M

FACULTY OF INFORMATICS

B.E. 3/4 (IT) II – Semester (Main) Examination, June 2014

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	Explain about Asymptotic notations.	3
2.	What are elementary data structures?	2
3	What is knapsack problem? Explain.	2
4	Mention any two applications of DFS.	3
5	What is spanning tree of a graph?	2
6	State Bellman's principle of optimality of dynamic programming.	3
7	What is Lower-Bound theory?	3
8	State graph coloring problem.	2
9	What is Decision problem?	2
10	What is NP-hard generation problem?	3

PART – B (50 Marks)

11	a)	Write an algorithm for insertion of an element into heap.	5
	b)	Give the algorithm for binary search and determine its time complexity by step count method.	5
12	a)	What is divide and conquer? Give the control abstraction.	4
	b)	Explain job sequencing with deadlines problem with an example. Give greedy solution.	6
13		Briefly argue how principle of a optimality holds for O/I knapsack problem, generate the sets. S^i, $0 \le i \le 4$. Where $(w_1, w_2, w_3, w_4) = (10, 15, 6, 9)$ and $(P_1, P_2, P_3, P_4) = (2, 5, 8, 9)$ – state the purging rules used. If knapsack capacity is m = 25, what is optimal solution.	10
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)	Write an algorithm to find the shortest path from a single source in a graph.	6
	b)	Explain traveling sales person problem.	4
16	a)	Discuss in detail about the problem of job sequencing with deadlines.	5
	b)	Write algorithm for finding minimum spanning tree of a digraph and explain it with an example.	5
17		Write short notes on :	
	a)	Node covering problem b) Cook's theorem	5 + 5

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