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Code No: CT1515

GEC-R14

II B. Tech II Semester Regular Examinations, April 2017

DESIGN AND ANALYSIS OF ALGORITHMS

(Information Technology)

Time: 3 Hours

Max. Marks: 60

Note: All Questions from **PART-A** are to be answered at one place.

Answer any **FOUR** questions from **PART-B**. All Questions carry equal Marks.

PART-A

6 × 2 = 12M

1. Define an Algorithm. List out properties of an Algorithm.
2. Write union and find algorithms.
3. Define minimum-cost spanning tree.
4. Write general-method for dynamic programming.
5. Define graph coloring problem.
6. Define LC search and give one example.

PART-B

4 × 12 = 48M

1. Explain all asymptotic notations with examples. (12M)
2. a) Explain and Write an algorithm for merge sort. (6M)
b) Analyze time complexity of merge sort. (6M)
3. a) Write an Algorithm for Job sequencing with deadlines. (6M)
b) Find a subset to job sequencing with deadlines, when
 $n=4$, $(P1,P2,P3,P4) = (100,10,15,27)$ and $(d1,d2,d3,d4) = (2,1,2,1)$. (6M)
4. a) Write an algorithm for Dynamic knapsack problem. (6M)
b) Generate the sets S_i $0 \leq i \leq 4$, when $(W1, W2, W3, W4) = (10,15,6,9)$
and $(P1,P2,P3,P4) = (2,5,8,1)$. (6M)
5. a) Explain and write general recursive backtrack algorithm. (6M)
b) Write an algorithm for finding all Hamiltonian cycles. (6M)
6. a) Write control abstraction for LC Search. (6M)
b) Draw the portion of state space tree generated by LCBB for the following knapsack instance. $n=5$, $m=12$ $(p1,p2,\dots,p5) = (10,15,6,8,4)$ and
 $(w1,w2,\dots,w5) = (4,6,3,4,2)$. (6M)
