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SEAT No. :

P113

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Oct.-16/BE/Insem.- 171

B.E. (Computer Engineering)

DESIGN AND ANALYSIS OF ALGORITHMS

(2012 Pattern) (Semester - I)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) ***Figures to the right indicate full marks.***
2) ***Assume suitable data, if necessary.***

Q1) a) Find the optimum solution to the knapsack instance using greedy approach n=7, m=15, (pl,p2.....p7)=(10,5,15,7,6,18,3) and (w1,w2,...... w7)=(2,3,5,7,1,4,1) **[6]**

b) What is the application proof technique? Explain proof by contradiction with example. **[4]**

OR

Q2) a) To sort following set of the data, if we are having quick sort and merge sort available, which algorithm do you select for the following instance of the data to sort it in ascending order. **[6]**

Set-1 : 0,1,2,3,4,5,6,7,8,9,10

Set-2 : 10,9,8,7,6,5,4,3,2,1,0

Set-3 : 0,2,4,3,5,7,8,6,9,10,1

Justify your answer with asymptotic notation.

b) What are P and NP classes of an algorithm? What is their relationship? **[4]**

Q3) What is principle of optimality? Solve the following instance of the OBST to construct and compute OBST using dynamic programming. **[10]**

N=6, Keys are {k1,k2,k3,k4,k5,k6}= {do, if, while, for, then, else}

Probability of successful search P(1:6) = {3,3,3,1,1,1}and probability of unsuccessful search Q(1:6) = {2,3,3,3,1,1,1}

P.T.O.

OR

Q4) What is principle of optimality? Solve the traveling salsesman problem for the following cost matrix using Dynamic programming. **[10]**

Cost Matrix =

Cities	1	2	3	4
1	--	2	10	5
2	2	--	9	--
3	4	3	--	4
4	6	8	7	--

Q5) Find an optimal solution for the following 0/1 knapsack instance using back tracking method: **[10]**

Number of objects n = 5, capacity of knapsack m = 100,

Profits = (10,20,30,40,50), weights = (20,30,66,40,60)

OR

Q6) Find an optimal solution for the following 0/1 knapsack instance using branch and bound method: **[10]**

Number of objects n = 5, capacity of knapsack m = 100,

Profits = (10,20,30,40,50), weights = (20,30,66,40,60)