DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
SECOND SESSIONAL
SUBJECT: (IT 509) Design And Analysis of Algorithm

Examination	**: B.TECH Semester - V**	**Seat No.**	**:**
Date	**: 01/09/2015**	**Day**	**: Tuesday**
Time	**: 12:00 to 1:15**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed.

(a) Show two problems with example where greedy algorithms is not able to give optimal solution of problem. **[2]**

(b) Compare kruskal and prim's algorithm to find minimum spanning tree for sparse and dense Graphs. **[2]**

(c) An undirected graph G has n nodes. Its adjacency matrix is given by N*N square matrix. Whose (i) diagonal elements are '0' and (ii) non diagonal elements are '1'. Which one of the following is true? **[2]**
   (a) Graph G has no minimum spanning tree
   (b) Graph G has unique minimum spanning tree of cost (n-1)
   (c) Graph G has multiple minimum spanning tree each of cost (n-1)
   (d) Graph G has multiple minimum spanning tree each with different cost

(d) What is principle of optimality? Why it is mandatory condition for dynamic programming based solution? **[2]**

(e) Solve given recurrence relation. $T_n = 2* T_{n-1} + n$ **[2]**

(f) What is optimization problem? Explain with example. **[2]**

Q.2 Attempt ***Any TWO*** of the following questions. **[12]**

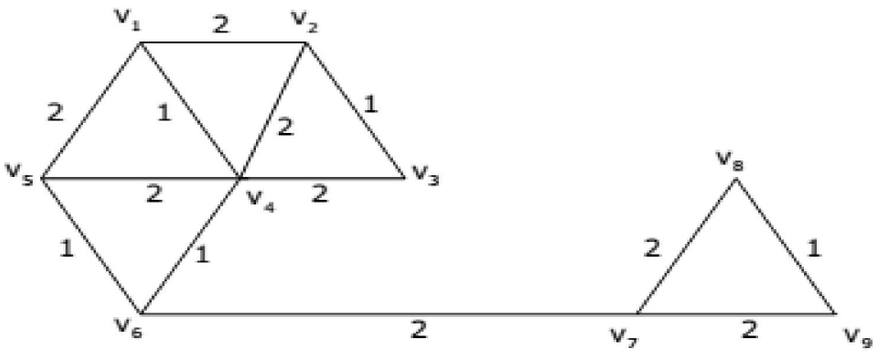
(a) Nine jobs are given below with their respective profits (Pi) and deadlines (D_i). Consider each job takes one time unit to complete.

Jobs	1	2	3	4	5	6	7	8	9
Profits(P_i)	15	20	30	18	18	10	23	16	15
Deadlines(D_i)	7	2	5	3	4	5	2	7	3

Using Greedy approach, find out Schedule in which we get maximum profit and each jobs in that schedule must be completed within their respective deadlines. (Use Fast approach and Clearly show the algorithm steps).

(b) Explain solution of Fractional knapsack problem using greedy algorithm with example. Can we get optimal solution for 0/1 Knapsack problem using greedy algorithm? Justify your answer.

(c) Find out total number of distinct minimum spanning trees for the weighted graph below is



Q.3 (a) Compare dynamic programming and divide & conquer based solution of Fibonacci problem. **[6]**

(b) Find the optimum string edit distance between "bbabaa" and "ababba". Also find the edit sequence. **[6]**

OR

Q.3 (a) Discuss dynamic programming based solution to making change problem with suitable example **[6]**

(b) Find all pair shortest path for adjacency matrix given below using Floyd's algorithm. **[6]**

	A	B	C	D
A	0	5	Infinite	Infinite
B	50	0	15	5
C	30	Infinite	0	15
D	15	Infinite	5	0