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

Examination	**: B.TECH Semester - V**	**Seat No.**	**:**
Date	**: 15/10/2015**	**Day**	**: Thursday**
Time	**: 3:00 to 4:15**	**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) Find the asymptotic relation between function $f(n)= 2^n$ and $g(n) = n!$ **[2]**

(b) In Quick sort, If array of size N is divide into two partitions with size 1 and (N-1) respectively Then What is the time Complexity? Explain your answer **[2]**

(c) Discuss difference between DFS and BFS techniques. **[2]**

(d) Discuss difference between NP complete and NP Hard problem. **[2]**

(e) How many minimum numbers of comparisons required to find the minimum and the maximum from the array of 200 different numbers? **[2]**

(f) Give difference between Dijkstra's and Floyd's algorithm. **[2]**

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

(a) Discuss backtracking solution for N-queen Problem using appropriate example.

(b) Discuss dynamic programming solution for Largest common subsequence between two string Problem using appropriate example.

(c) Discuss Kruskal's algorithm to find minimum spanning tree using suitable example to find the time complexity.

Q.3 (a) Solve following recurrence relation. **[6]**

$T_n = n$ if n=0,1,2

$T_n = 5T_{n-1} - 8T_{n-2} + 4T_{n-3}$, otherwise

(b) Find 10^{th} smallest element of given numbers using K^{th}-smallest element selection algorithm. **[6]**
[150, 70, 120, 450, 990, 510, 630, 440, 750, 280, 790, 340, 180, 390, 810]. (Clearly show the algorithm steps).

OR

Q.3 (a) Discuss Greedy Programming solution for Job scheduling problem with profit and deadline using appropriate example. **[6]**

(b) 4 job agents and 4 jobs are exists. Cost matrix for assignment of jobs is given below. **[6]**

Agents/jobs	1	2	3	4
A	11	12	18	40
B	14	15	13	22
C	11	17	19	23
D	17	14	20	28

Using Branch and Bound, assign one job to one agent such that total cost of assignment is Minimum.