DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
BLOCK SESSIONAL
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 divided 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 the following questions. **[12]**

(a) Discuss backtracking solution for N-queen Problem using appropriate example. **[6]**

(b) Discuss dynamic programming solution for Largest common subsequence between two string Problem using appropriate example. **[6]**

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).