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	**: 13/10/2017**	**Day**	**: Friday**
Time	**: 11:30 to 12:45**	**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) Define P and NP problem. Also give the relation between P and NP **[2]**

(b) Prove that 2-SAT is in P **[2]**

(c) Compare DFS, BACKTRACING and BRANCH & BOUND algorithm for searching solution space tree **[4]**

(d) Explain non-deterministic search algorithm with necessary operations and compare the time complexity with equivalent deterministic algorithm **[2]**

(e) Explain the notion of reducibility with example. **[2]**

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

(a) Find the Longest Common Subsequence for the strings ***"aabbab"*** and ***"ababba"***. Also write the recursive equation for finding LCS.

(b) Give the Decision Tree Model of computing? Also find the lower bound on sorting problem using the same.

(c) Compute *dfn* and *L* values for all the nodes in the Graph (shown in Fig.1) and find the articulation point if any (consider node 0 at root node)

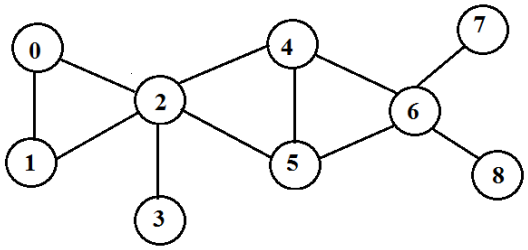

Figure 1 Graph for Q.2c

Q.3 (a) Discuss backtracking solution to n-queen problem **[6]**

(b) Solve Job Assignment problem using Branch and Bound **[6]**

	1	2	3	4
A	15	12	13	40
B	14	17	18	28
C	5	15	19	23
D	10	14	20	22

OR

Q.3 (a) What is CLIQUE problem? Prove that CLIQUE is NPC using reduction **[6]**

(b) Discuss the 15-puzzel problem using branch and bound (show the solution tree up to level 3 only) **[6]**