



DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
THIRD SESSIONAL

SUBJECT: (IT 509) Design And Analysis of Algorithm

Examination : B.TECH Semester - V

Seat No. :

Date : 06/10/2015

Day : Tuesday

Time : 12:00 to 1:15

Max. Marks : 36

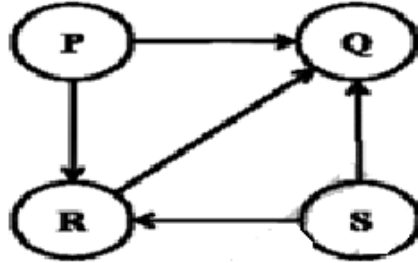
INSTRUCTIONS:

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) How one can find lower bound through reduction? Explain with example. [2]

(b) [2]



In Given graph which of the following is true? (a) The graph does not have any topological ordering.(b) Both PQRS and SRQP are topological ordering.(c) Both PSRQ and SPRQ are topological ordering.(d) PSRQ is the only topological ordering.

(c) Consider the tree arcs of a BFS traversal from a source node W in an un-weighted, connected, Un-directed graph. The tree T formed by the tree arcs is a data structure for computing [2]

- (a) The shortest path between every pair of vertices.
- (b) The shortest path from W to every vertex in the graph.
- (c) The shortest paths from W to only those nodes that are leaves of T.
- (d) The longest path in the graph.

(d) [2]

(e) [2]

(f) [2]

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

(a)

(b)

(c)

Q.3 (a) 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	110	120	180	400
B	140	150	130	220
C	110	170	190	230
D	170	140	200	280

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

(b) Travelling salesman problem states that from given N cities, salesman start from any one city and he has to visit all N cities exactly once without repetition of any city and come back to city from where he started. Find the travelling salesman path for below given adjacency matrix using Branch & Bound. [6]

	A	B	C	D	E
A	-	10	8	9	7
B	10	-	10	5	6
C	8	10	-	8	9
D	9	5	8	-	6
E	7	6	9	6	-

OR

Q.3 (a) Discuss lower bound of problem in detail. Prove that lower bound of sorting problems is $\Omega(n \log n)$ time using decision tree model. [6]

(b) Find all articulation points of following graph. Show all steps of algorithm clearly. [6]

