Total No. of Questions : 8] **SEAT No. :**

PA-1503 **[Total No. of Pages : 3**

[5926]-123
T.E. (Information Technology)
DESIGN & ANALYSIS OF ALGORITHMS
(2019 Pattern) (Semester-I) (Elective - I) (314445A)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Write bellman ford algorithm to find the shortest path and analyze it. **[9]**

b) Compare dijkstras algorithm and bellman ford algorithm to find Shortest Path problem? **[9]**

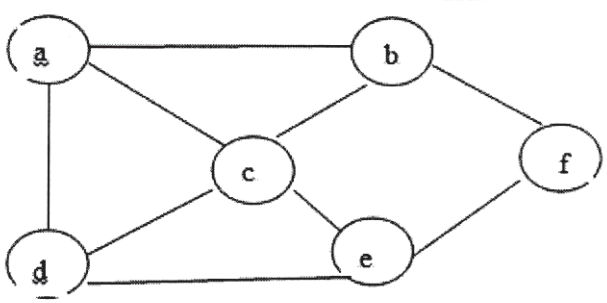
OR

Q2) a) Explain multistage graph problem (using forward computation) in detail? **[9]**

b) Solve the following instances of knapsack problem using dynamic programming for number of object n=4. Knapsack capacity m = 8. **[9]**

Item	1	2	3	4
Weight	2	1	3	2
Value	$12	$10	$20	$15

Q3) a) Find the Hamiltonian cycle by using backtracking method in the given graph. **[9]**



P.T.O.

b) Consider Knapsack problem: n=8, **[8]**
(w1,w2,w3,w4,w5,w6,w7,w8)=(1,11,21,33,43,45,55),
p=(l 1,21,31,33,43,53,55,65) m=110 .Solve the problem using backtracking

OR

Q4) a) Write an algorithm for graph coloring problem using backtracking method. **[9]**

b) Differentiate between backtracking and branch and bound. Draw state space tree. **[8]**

Q5) a) Explain the Branch & Bound algorithmic strategy for solving the problem, take an example of traveling salesman problem using branch & bound.**[9]**

b) Explain the 8 – Queens problem & explain the following with respect to 8 – Queens problem. **[9]**

- State space tree
- Solution state
- State space
- Answer state
- Static tree
- Dynamic tree
- Live node
- Bounding function

OR

Q6) a) Describe the following with respect to B & B. **[9]**

- The method
- LC search
- Control abstraction for LC search
- Bounding function

b) Solve the following instance of the knapsack problem by branch and bound algorithm for W=16. **[9]**

Item	Weight	Value in Rs.
1	10	100
2	7	63
3	8	56
4	4	12

Q7) a) Explain the Clique Problem. **[9]**

b) Give the relationship between P,NP,NP complete, and NP hard problem. **[8]**

OR

Q8) a) What do you mean by P, NP, NP complete and NP hard problem with example. **[9]**

b) What is non-deterministic algorithm. Write any one non-deterministic algorithm. **[8]**