

Total No. of Questions : 8]

SEAT No. :

P2326

[Total No. of Pages : 2

[5870]-1144

T.E. (Information Technology)

DESIGN & ANALYSIS OF ALGORITHMS

(2019 Pattern) (Semester - I) (314445A) (Elective - I)

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 side indicate full marks.*
- 4) *Assume suitable data, if necessary.*

Q1) a) Consider 0/1 knapsack problem $N = 3$; $W = (4, 6, 8)$ and $P = (10, 12, 15)$. by using dynamic programming determine the optimal profit for knapsack capacity 10? [9]

b) Explain coin change Making problem in detail? [9]

OR

Q2) a) Explain how dynamic programming is used to obtain optimal solution for travelling salesperson problem. also explain why this technique is not used to solve TSP for large number of cities? [9]

b) What is dynamic programming? Is this the optimization technique? Give reasons what are its drawbacks? [9]

Q3) a) Find all possible solutions for 5 queens problem using backtracking. [9]

b) Current configuration is (7, 5, 3, 1) for 8 queens problem. Find the answer tuple using backtracking method. [8]

OR

Q4) a) State the principle of backtracking. Explain the constraints used in backtracking with an example. [9]

b) What is m colorability optimization problem. Explain with an example. [8]

Q5) a) Differentiate between backtracking & branch and bound. Illustrate with example of Knapsack problem. [9]

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- b) Solve following Job sequencing with deadline problem using Branch and Bound. [9]

Job	P	d	t
1	5	1	1
2	10	3	2
3	6	2	1
4	3	1	1

OR

- Q6)** a) 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

- b) Describe the following with respect to B & B [9]
- The method
 - LC search
 - Control abstraction for LC search
 - Bounding function

- Q7)** a) When do you claim that algorithm is polynomial time algorithm? Explain with an example. [9]

- b) Explain i) Complexity Classes ii) Deterministic Algorithms. [8]

OR

- Q8)** a) Explain Vertex cover problem in detail. [9]

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

