Total No. of Questions : 10]

SEAT No. :

P3006

[Total No. of Pages : 3

[5669]-598
T.E. (Information Technology)
DESIGN & ANALYSIS OF ALGORITHMS
(2015 Pattern) (Semester - II)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) *Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7, or Q.8, Q.9, or Q.10.*
2) *Neat diagrams must be drawn whenever necessary.*
3) *Figures to the right indicate full marks.*
4) *Assume suitable data if necessary.*

Q1) a) List the properties of various asymptotic notations. **[5]**

b) Describe the strategy to analyse the non-recursive algorithm with suitable example. **[5]**

OR

Q2) a) Compare apriori & posteriory analysis of algorithms. **[4]**

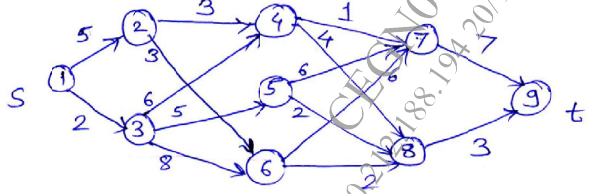
b) Write an algorithm for binary search and write its recurrence relation. Give its time complexity. **[6]**

Q3) a) State the principle of optimality. Explain its significance in brief. **[5]**

b) Compare Dijkstra's Algorithm & Bellman ford algorithm to find single source shortest path. **[5]**

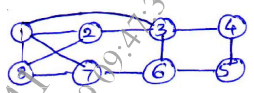
OR

Q4) Solve the following instance of Multistage graph by dynamic programming backward approach. **[10]**



P.T.O.

Q5) a) Find Hamiltonian cycle for given graph using backtracking method. Draw a state - space tree for the same. **[8]**



b) Write an algorithm for graph colouring problem using backtracking method. **[8]**

OR

Q6) a) Write an iterative and a recursive backtracking algorithm for N-Queens problem. **[8]**

b) Let W = {5,10,12,13,15,18} & M = 30 Find all possible subsets of W that sum to M. **[8]**

Q7) a) Explain 8-Queens problem & explain the following with respect to 8-Queens problem. **[10]**

i) State space tree ii) Solution State

iii) State space iv) Answer state

v) Static tree vi) Dynamic tree

vii) Live node viii) Bounding function

b) Differentiate between Backtracking & branch and bound. Illustrate with example of knapsack problem. **[8]**

OR

Q8) a) Solve the following instance of the knapsack problem by branch & bound algorithm. **[8]**

n = 4, W (1:4) = {10,7,8,4}, P (1:4) = {100,63,56,12}, knapsack capacity M = 16

b) Explain branch & bound technique and different strategies used in it like LCBB, FIFOBB, compare LCBB & FIFOBB. **[10]**

Q9) a) Write an algorithm for pointer doubling problem. What is its time complexity? **[8]**

b) Show that 3-SAT problem is NP-Complete. **[8]**

OR

Q10)a) Explain NP-Hard, NP-Complete, Decision problem & Polynomial time algorithm. **[8]**

b) Explain in detail models for parallel computing. **[8]**

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