Total No. of Questions :10]

SEAT No. :

P1770

[Total No. of Pages :3

[5058]-410

T.E. (Information Technology)

DESIGN & ANALYSIS OF ALGORITHMS

(2012 Pattern) (Semester - II) (End-Sem.)

Time : 2½ Hours] *[Max. Marks :70*

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10.***
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) Prove by method of contradiction that "There is no greatest even integer". **[5]**

b) Write an algorithm for binary search and find the worst case efficiency. **[5]**

OR

Q2) a) Set up a recurrence relation to compute n! and solve it. **[5]**

b) Construct Huffman tree for the following data and obtain it's Huffman's code. **[5]**

Character	A	B	C	D	E	-
Probability	0.5	0.35	0.5	0.1	0.4	0.2

Q3) a) Write Warshall's algorithm to find transitive closure. **[5]**

b) Show the steps in multiplying the following two integers using efficiency integer multiplication method: 2101*1130. **[5]**

OR

P.T.O.

Q4) a) Explain the concept of divide and conquer technique. Write Master theorem. **[5]**

b) Write Flyod's algorithm to find all pairs shortest paths problem. **[5]**

Q5) a) Write recursive backtracking schema for m-coloring of the graph. **[8]**

b) Write a short note on: **[8]**

i) State space tree

ii) 0/1 Knapsack Problem

OR

Q6) a) Write recursive backtracking algorithm for sum subset problem. **[8]**

b) Write a short note on: **[8]**

i) The 8 queen Problem

ii) Hamiltonian Cycle

Q7) What is travelling salesman problem? Find the solution of following travelling salesman problem using branch and bound method. **[18]**

∞	20	30	10	11
15	∞	16	4	2
3	5	∞	2	4
19	6	18	∞	3
16	4	7	16	∞

Cost Matrix

OR

Q8) Consider the knapsack instance n = 4, (p1, p2, p3, p4) = (10, 10, 12, 18), (w1, w2, w3, w4) = (2, 4, 6, 9) and m = 15.

Find maximum profit using FIFOBB and LCBB. Use fixed size formulation for state space tree. **[18]**

Q9) a) Specify one example of Np - hard problem. Justify why it is Np-hard. **[8]**

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

OR

Q10) a) Prove that vertex cover problem is Np complete. **[8]**

b) Explain pointer doubling algorithm. **[8]**

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