6E6022

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6E6022

B. Tech. VI-Sem. (Main/Back) Exam., April/May-2016
Computer Science & Engineering
6CS2A Design and Analysis of Algorithms
CS, IT

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks (Main & Back): 26

Instructions to Candidates:-

*Attempt any **five questions,** selecting **one question** from **each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Solve the recurrence relation for time complexity : [4]

$T(n) = 2$ if $n = 2$

$T(n) = 2T(n/2)+3n$ if $n > 2$

(b) Explain various types of asymptotic notations in detail. [4]

(c) Illustrate the operation of merge sort on following array 10, 20, 5, 23, 45, 34, 12. Also write the algorithm & its complexity. [8]

OR

Q.1 (a) Explain Stassen's matrix multiplication & derive its complexity also? Justify how is it better than ordinary matrix multiplication. [8]

(b) Explain Prim's algorithm for finding minimum spanning tree. [8]

UNIT-II

Q.2 (a) What is Dynamic programming? How it gives the optimal solution? Consider n =3, consider M =6 , (w1, w2, w3) = (2, 3, 3)

(p1, p2, p3) = (1, 2, 4)

Find optimal solution for given knapsack problem. [8]

(b) Explain Matrix chain multiplication. Also find the parenthesization for the following matrix A1 =15×10, A2 = 10×20, A3 = 20×25 [8]

OR

Q.2 (a) Suggest an approximation algorithm for traveling sales person problems using minimum spanning tree algorithm. Assume that the cost function satisfies the triangle inequality. [8]

(b) What is backtracking? Explain 8-queens problem, also write algorithm for the same. [8]

UNIT-III

Q.3 (a) Explain Naïve string matching algorithm using suitable example. [8]

(b) Solve the given assignment problem by branch and bound method. [8]

	Job 1	Job 2	Job 3	Job 4
Person 1	9	2	7	8
Person 1	6	4	3	7
Person 1	5	8	1	8
Person 1	7	6	2	4

OR

Q.3 (a) Explain Boyer Moore Algorithms with suitable example. [8]

(b) Explain the Quadratic Assignment Problem with suitable example. [8]

UNIT-IV

Q.4 (a) What do you mean by randomized algorithms. Explain Las Vegas algorithms and Monte Carlo algorithms with suitable examples. [10]

(b) Explain Flow shop scheduling with suitable example. [6]

OR

Q.4 (a) Describe problem definition of Multicommodity flow in the network. State and prove the Ford Fulkerson's theorem. [8]

(b) Explain Randomized min cut theorem with suitable example. [8]

UNIT-V

Q.5 (a) Explain NP Hard and NP Complete with example. [8]

(b) Explain the Cook's theorem with suitable example. [8]

OR

Q.5 (a) Prove that Hamilton cycle problem is NP complete. [8]

(b) Explain Approximation Algorithms for Vertex and Set Cover problem. [8]
