

Total No. of Questions : 5

Total No. of Printed Pages : 4

EK-211

B.E. (Vth Sem.) (CGPA) CSE Examination-2016

ANALYSIS & DESIGN OF ALGORITHMS

Paper - CS-503

Time Allowed : Three Hours

Maximum Marks : 60

Note : Attempt all questions.

All questions carry equal marks.

Q.1 (a) What is an algorithm ? What are the factors for analyzing an algorithm ?

(b) Following nodes are inserted in empty tree to form minimum heap with neat sketches, show how insertion will be done 8, 7, 11, 6, 2, 1, 5, 12.

or

(a) Solve the Recurrence—

$$T(n) = \begin{cases} 1 & \text{if } n=1 \\ 2T(n/2) + n & \text{if } n > 1 \end{cases}$$

EK-211

P.T.O.

(2)

(b) Describe iterations and recursions with suitable examples.

Q.II (a) Explain how to apply the divide and conquer strategy for sorting the elements using quick sort ?

(b) What is principle of optimality ? Explain with example.

or

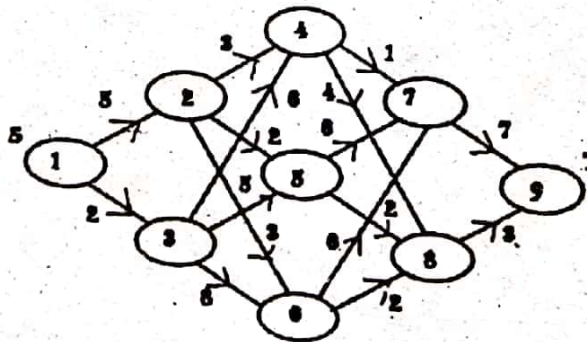
(a) Explain the Strassen's multiplication technique ?

(b) What is quick sort ? Sort the following array using quick sort method—

24 56 47 35 10 90 82 31

Q.III (a) Give an algorithm for computing minimum spanning tree.

(b) Find a minimum cost path from 'S' to 't' in multistage graph using dynamic programming.



EK-211

Contd.

(3)

or

- (a) Write a single source shortest path algorithm and its time complexity ?
- (b) Explain reliability design problem in detail.

Q.IV (a) Explain about 0/1 Knapsack Problem using branch and bound with example.

- (b) Explain Flyod Warshall Algorithm with suitable example.

or

- (a) Find optimal solution for 0/1 knapsack problem
 $(w_1, w_2, w_3, w_4) = (10, 15, 6, 9);$
 $(P_1, P_2, P_3, P_4) = (2, 5, 8, 1)$ and $M = 30$.
- (b) Discuss the solution for travelling salesman problem using branch and bound technique.

Q.V (a) Create a B tree for the following list of elements
 $L = (86, 50, 40, 3, 94, 10, 70, 90, 110, 113, 116)$
 given minimization factor $t = 3$, minimum degree = 2 and maximum degree = 5.

- (b) Insert the elements in the order shown to build them into an AVL tree. Also determine the complexity of this procedure —
 1, 26, 2, 25, 3, 24, 4, 23, 5, 22, 6.

(4)

or

(a) What are Hamiltonian cycles ? Write the algorithm, which finds all Hamiltonian cycles in a graph.

(b) What do you mean by hashing ? Explain any four popular hash functions.
