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BICS-014

B.Tech. – VIEP – COMPUTER SCIENCE AND ENGINEERING (BTCSVI)

Term-End Examination

June, 2015

00748

BICS-014 : DESIGN AND ANALYSIS OF ALGORITHM

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry equal marks.*

1. (a) Prove that f(n) = O(n(n)) where f(n) = O(g(n)) and g(n) = O(n(n)). *3*

(b) Define Omega notation. Explain the terms involved in it. Give examples. *2*

(c) State and prove Master theorem. *5*

2. (a) With an example, explain merge sort. *5*

(b) What is heap sort ? Explain with an example. *5*

3. (a) Write deletion algorithm for binary search. *5*

(b) State and explain Knuth-Morris-Pratt matching algorithm. *5*

4. In how many ways may the following chain of matrices be multiplied ?

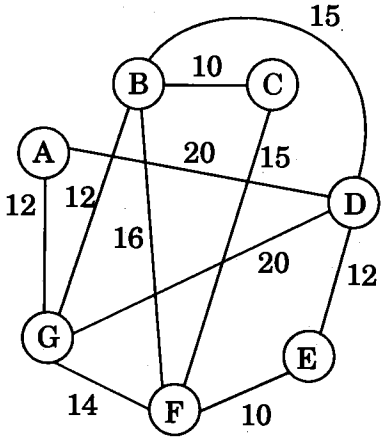
$$\underset{[2 \times 5]}{A} \times \underset{[5 \times 3]}{B} \times \underset{[3 \times 6]}{C} \times \underset{[6 \times 4]}{D}$$

Find the number of multiplications required in each case. *10*

5. (a) Write an algorithm of greedy knapsack and also analyze its time complexity. *5*

(b) Construct a Huffman code algorithm using greedy method. *5*

6. Using Kruskal's algorithm, find the minimal spanning tree of *10*



7. (a) Explain the classes of NP-Hard and NP-Complete. *5*

(b) Explain the Hamiltonian cycles with a neat diagram. *5*

8. (a) Write a short note on Dynamic Programming. *5*

(b) Write down the steps for approximate coloring, with an example. *5*

9. (a) Write down the steps for verifying matrix multiplication. *5*

(b) What is Miller-Rabin test ? Explain it. *5*

10. (a) What are the applications of cryptography ? *5*

(b) What is knapsack problem ? Explain. *5*