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Total No. of Questions : 9] [Total No. of Pages : 02

Paper ID [A0467]

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B.Tech. (Sem. - 5th)

DESIGN AND ANALYSIS OF ALGORITHMS (CS - 307)

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

1) Section - A is **Compulsory**.
2) Attempt any **Four** questions from Section - B.
3) Attempt any **Two** questions from Section - C.

Section - A

Q1) *(10 x 2 = 20)*

a) Define Big Omega Notation (Ω) and Little Omega Notation (ω).

b) What is re-entrant program?

c) What is Akermann's function give example?

d) What is the basic principal of Divide and Conquer?

e) What is stable sorting?

f) Differentiate between Top-down and Bottom-up approach.

g) Define recurrence relation.

h) Given an example of an algorithm which is infinite in nature.

i) Name three conditions under which sequential search of a list is preferable to binary search.

j) What is an algorithm?

Section - B

(4 x 5 = 20)

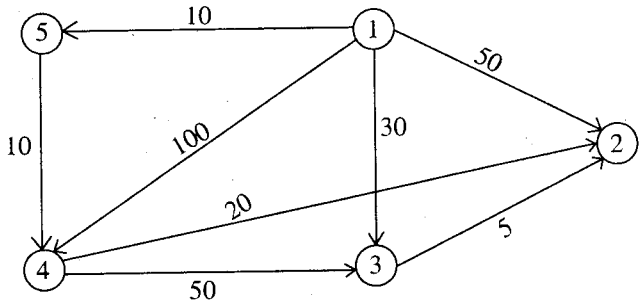
Q2) Differentiate between N-P hard and N-P complete problems with example.

Q3) Find lower bound for multiplying m x n matrix with n x 1 vector.

Q4) Write a algorithm for Quick sort and complexity.

Q5) Explain how the knapsack problem can be solved using branch and bound algorithms.

Q6) Find the shortest path from node 1 to all vertices of the graph given below. Show all the intermediate steps. The numbers on the edges are the weights.



Section - C

(2 x 10 = 20)

Q7) Compare general and recursive back tracking methods and also write a algorithm to find all Hamiltoman cycle for graph using back tracking method.

Q8) Define a minimum spanning tree. Write Prim's algorithm to find minimum spanning tree.

Q9) Write short note on following:

(a) Techniques for algebraic problems.

(b) Polynomial time algorithm.