Roll No. .....

Total No. of Questions : 09] [Total No. of Pages : 02

B. Tech. (Sem. - 5th)

DESIGN AND ANALYSIS OF ALGORITHMS

SUBJECT CODE : CS - 307

Paper ID : [A0467]

[Note : Please fill subject code and paper ID on OMR]

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 × 2 = 20)*

a) Define Big oh Notation (O) and Little oh Notation (o).

b) What is re-entrant program?

c) What is NP complete?

d) What are row major and column major ordering?

e) What is the purpose of AVL Tree?

f) Differentiate between space complexity and Time space trade off.

g) What is a solution space in the backtracking?

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) State the knapsack problem using branch and bound technique.

Section - B

(4 × 5 = 20)

Q2) Does greedy algorithm always give an optimal solution? Give arguments to support your answer.

Q3) Among Merge sort, Insertion sort and Bubble sort which sorting technique is the best in worst case. Support your arguments with an example and analysis.

Q4) Write a recursive algorithm for Binary search Tree and complexity.

Q5) What are the features of branch and bound algorithms? Discuss in detail.

Q6) Sort the following using Geapsort technique L=<5,9,20,8,4,100,11,3,30 >.

Section - C

(2 × 10 = 20)

Q7) (a) What are approximation algorithms? Explain approximation vertex cover.

(b) Using Knuth-Marries-pratt algorithm find whether the pattern P = <0010> is in the text

T = < 11010000101000101001001O>.

Q8) What do you mean by dynamic programming? Explain assignment problem with example.

Q9) Define a minimum spanning tree. Write Kruskal's algorithm to find minimum spanning tree.