

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.

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P.T.O.

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 $L = \langle 5, 9, 20, 8, 4, 100, 11, 3, 30 \rangle$.

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 $P = \langle 0010 \rangle$ is in the text

$T = \langle 110100001010001010010010 \rangle$.

- 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.

