

Roll No.

Total No. of Questions : 09]

[Total No. of Pages : 02

Paper ID [CS307]

(Please fill this Paper ID in OMR Sheet)

B.Tech. (Sem. - 5th)

DESIGN OF ALGORITHM ANALYSIS & DESIGN (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

(10 × 2 = 20)

Q1)

- a) What are the various steps in the design of an algorithm?
- b) Is $2n + 1 = 0$ ($2n$)?
- c) What is the worst case running time of Quick sort?
- d) What is time complexity?
- e) Define Non-deterministic algorithm.
- f) What are the conditions under which backtracking can be used?
- g) What is the order of Bubble Sort?
- h) What is a NP-Hard problem?
- i) What are Explicit & Implicit constraints?
- j) Give brief concept of Divide & Conquer.

Section - B

(4 × 5 = 20)

Q2) Define Kruskal's algorithm.

Q3) What is algorithm? Write the various performance analysis techniques of algorithm. Discuss advantages and disadvantages of each.

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P.T.O.

- Q4)** Explain how to validate and analyze the algorithms.
- Q5)** What is Greedy Method? State and write algorithm for Knapsack problem using Greedy Method.
- Q6)** Write a string processing algorithm to identify whether a particular sequence of characters is there in the string or not.

Section - C

(2 × 10 = 20)

- Q7)** What are approximation algorithms? Define absolute approximation and E-approximation with example.
- Q8)** Explain the backtracking problem with 4 queens on a 4 × 4 chessboard.
- Q9)** What do you mean by complexity of an algorithm? Define time and space complexity with examples.

