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Total No. of Questions : 09]

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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) Explain the term the order of complexity.

b) Give the general characteristics of greedy algorithm.

c) Describe the general principle of Divide and conquer.

d) Explain the asymptotic notation.

e) What is re-entrant program?

f) What is stable sorting?

g) Differentiate between NP-Hard and NP-Complete.

h) What do you mean by worst case analysis?

i) Define Non-deterministic algorithm.

j) Give an example of an algorithm which is infinite in nature.

Section - B

(4 × 5 = 20)

Q2) Differentiate between deterministic and non-deterministic algorithms?

Q3) Explain how the knapsack problem can be solved using branch and bound algorithms.

Q4) Explain the backtracking problem with the help of suitable example?

Q5) Explain how to validate and analyze the algorithms.

Q6) Explain the algorithm of a non-deterministic finite automation.

Section - C

(2 × 10 = 20)

Q7) Explain in detail basic concepts of P, NP, NP-hard and NP-complete problems.

Q8) Explain in detail the structure of string storage. Design an algorithm which finds number of words, lines and characters in a given text.

Q9) What do you mean by complexity of an algorithm? Define time and space complexity with examples.