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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) Give two metrics for evaluating an algorithm.

b) What is the time complexity of selection sort.

c) Differentiate between Deterministic and Non-deterministic algorithms?

d) Define asymptotic notation.

e) State Knapsack problem using branch and bound condition.

f) Is 2n + 2 = O (2n+1)?

g) Define the term backtracking.

h) State the concept of divide and conquer.

i) Differentiate between top down and bottom up approaches.

j) Define recurrence relation?

Section - B

(4 × 5 = 20)

Q2) Compare N-P hard and N-P complete problems by taking examples of both.

Q3) Define minimum spanning tree. Write in short about any one of the algorithms used for finding the minimum spanning tree.

Q4) Amongst the various sorting techniques as Merge Sort, Insertion Sort and Bubble Sort, which is best in worst case? Support your arguments with analysis.

Q5) Write short note on Polynomial time algorithm.

Q6) Describe the dynamic programming algorithm for computing the minimum cost.

Section - C

(2 × 10 = 20)

Q7) What are String matching Algorithms? Given a text string S and a pattern string P, determine all the occurrences of P in S.

Q8) What do you mean by complexity of an algorithm? Define time and Space complexity with examples, Compare the results of both.

Q9) Discuss four queens problem on a. 4x4 chess board.