

Total No. of Questions: 6

Seat No.:

BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-V Computer Science & Business Systems : WINTER: 2025
SUBJECT: DESIGN & ANALYSIS OF ALGORITHMS

Day : Monday
Date : 08/12/2025

W-30741-2025

Time : 02:30 PM-05:30 PM
Max. Marks : 60

NB :

1. Draw neat labelled diagrams WHEREVER necessary.
2. Figures to the right indicate FULL marks.
3. All questions are COMPULSORY.

Q. 1 Explain following methods to solve recurrences with suitable example (10)

1. Substitution Method
2. Master's Method

OR

Q. 1 Write a short note on Performance measurement of Algorithm (10)

Q. 2 Describe in detail the coin changing problem with an example. (10)

OR

Q. 2 Describe the heuristics approach in algorithms. Discuss its advantages and limitations with a suitable real-world problem example. (10)

Q. 3 Explain the concept of Dynamic Programming and how it differs from divide and conquer. Illustrate with the example of the Longest Common Subsequence problem. (10)

OR

Q. 3 Solve the Traveling Salesman Problem (TSP) for a small set of cities using the Branch and Bound approach. (10)

Q. 4 Explain Depth-First Search (DFS) and compare it with BFS in terms of usage and application scenarios. (10)

OR

Q. 4 Explain the concept of Minimum Spanning Tree. Describe Kruskal's and Prim's algorithms with suitable diagrams. (10)

Q. 5 Describe the complexity classes P and NP. What distinguishes problems in P from problems (10)

in NP?

OR

Q. 5 State Cook's theorem and discuss its significance in computational theory. (10)

Q. 6 Discuss how randomized approximation algorithms can be combined to efficiently approximate NP-hard problems. (10)

OR

Q. 6 Define approximation algorithms and explain their importance in solving NP-hard optimization problems. (10)

081225-e-coe-mumbai