

Unit IV

No. of Printed Pages : 04

Roll No.

7. What do you mean by NP-Completeness ?
State and prove the Cook's theorem. List its applications. **15**
8. What do you mean by Randomized algorithm ?
Compare the Randomized algorithm with deterministic algorithms. When is randomness useful ? **15**

18D3

B. Tech. EXAMINATION, 2024

(Fourth Semester)

(C Scheme) (Main & Re-appear)

(CSE)

DESIGN AND ANALYSIS OF
ALGORITHMS

CSE206C

Time : 3 Hours]

[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. Write the essential characteristics of an algorithm. Write an algorithm to construct the optimal binary search tree given the roots $r(i, j)$, $0 \leq i \leq j \leq n$. Show that this can be done in time $O(n)$. **15**
2. Obtain the asymptotic bound using recursion tree method for the below mentioned recurrence relations : **15**
 - (i) $T(n) = 4T(n/2) + n$
 - (ii) $T(n) = 2T(n/2) + n^2$

Unit II

3. What are the different approaches of dynamic programming technique ? Explain the solution of a travelling sales person problem using dynamic programming **15**
4. Explain General method of Greedy method. Find the greedy solution for the following

job sequencing with deadlines problem $n = 7$,
($p_1, p_2, p_3, p_4, p_5, p_6, p_7$) = (3, 5, 20, 18, 1, 6, 30), ($d_1, d_2, d_3, d_4, \dots, d_7$) = (1, 3, 4, 3, 2, 1, 2). **15**

Unit III

5. Explain how solution will be provided for all pairs shortest path problem using dynamic programming. **15**
6. Write and explain the Kruskal's algorithm for finding the minimum spanning tree. Construct a MST for the following graph : **15**

