Seat No._____ Enrollment No._____

KADI SARVA VISHWAVIDYALAYA

B.E. CE SEMESTER V EXAMINATION (April 2024)

SUBJECT CODE: CE504-N
SUBJECT NAME: Design and Analysis of Algorithms

DATE: 13th April 2024 TIME: 12:00 PM to 3:00 PM TOTAL MARKS: 70

Instructions:

1. Answer each section in separate Answer sheet.
2. All questions are compulsory.
3. Indicate clearly, the options you attempted along with its respective question number
4. Use the last page of main supplementary for rough work

SECTION 1

Q:1 (All Compulsory)

(A) Explain all asymptotic notations used in algorithm analysis. 05

(B) Arrange following rate of growth in increasing order. 2^n, n log n, n^2, 1, n, log n, n!, n^3 05

(C) Explain Bubble sort algorithm. Derive the algorithmic complexity in Best case, worst case and Average case analysis. 05

OR

(C) Explain Quick Sort Method with example. 05

Q:2 (A) Differentiate BFS and DFS. 05

(B) What is Principle of Optimality? Explain its use in Dynamic Programming Method. 05

OR

(A) Solve Making Change problem using Dynamic Programming. (denominations: d1=1,d2=4,d3=6). Give your answer for making change of Rs. 8. 05

(B) Write an algorithm of Selection Sort Method. Give its complexity. 05

Q:3 (A) Explain the Kruskal's Algorithm to find out Minimum Spanning Tree with illustration. 05

(B) Explain why the Heap sort method is called an efficient sorting algorithm. Sort the following data using Heap sort method. 05

65, 77, 5, 25, 32, 45, 99, 83, 69, 81

OR

(A) Solve the following recurrence equation with master method 05

1. $T(n)= 9T(n/3) + n$

2. $T(n)= 3T(n/4) + n\lg n$

(B) What is Divide and Conquer Technique? Give the use of it for Binary Searching Method. 05

SECTION 2

Q:4 (All Compulsory)

(A) Explain Branch and Bound Technique in brief. 05

(B) Explain Strasson's algorithm for matrix multiplication. 05

(C) Explain in brief characteristics of greedy algorithms. Compare Greedy Method with Dynamic Programming Method 05

OR

(C) Give the algorithm to solve Tower of Hanoi Problem. 05

Q:5 (A) Explain the use of Backtracking method for solving Eight Queens Problem giving its algorithm. 05

(B) Compare NP-Hard with NP-Complete problems. 05

OR

(A) Explain Chained Matrix Multiplication with example. 05

(B) Explain Prim's algorithm with example for construction of MST. 05

Q:6 (A) Find Longest Common Subsequence using Dynamic Programming Technique with illustration X={A,B,C,B,D,A,B} Y={B,D,C,A,B,A} 05

(B) Solve following knapsack problem using dynamic programming algorithm with given capacity W=5, Weight and Value are as follows: 05
(2, 12), (1, 10), (3, 20), (2, 15).

OR

(A) Explain Rabin-Karp Algorithm for string matching and give it complexity 05

(B) Explain in Brief: Travelling Salesman Problem. 05