3C3002

Roll No. _____

Total No. of Pages: 2

3C3002

MCA III - Sem. (Main / Back) Exam., - 2024

MCA – 302 Analysis and Design of Algorithm

Time: 3 Hours

Maximum Marks: 70
Min. Passing Marks: 28

Instructions to Candidates:

Attempt all ten questions from Part A. All five questions from Part B and three questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL _____ 2. NIL _____

[10×2=20]

PART – A

(Answer should be given up to 25 words only)

All questions are compulsory

Q.1 What is an algorithm?

Q.2 What are the applications of divide and conquer algorithm?

Q.3 What do you mean by greedy problems?

Q.4 Define Kruskal's algorithm.

Q.5 What do you mean by dynamic programming?

Q.6 What are multistage graphs?

Q.7 What do you mean by minimum spanning tree?

Q.8 State any two backtracking methods.

Q.9 What is Space and Time complexity?

Q.10 What is First-order linear recurrence?

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt all five questions

Q.1 Explain different asymptotic notations.

Q.2 Explain steps involved in Dijkastra Algorithm.

Q.3 Explain 0/1 knapsack dynamic programming problem.

Q.4 Explain 8-Queens problem and a method to solve it.

Q.5 Explain P, NP and NP – complete problems.

[3×10=30]

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

Q.1 Explain quick sort algorithm. Sort the list: 100, 800, 320, 910, 430, 500, 750 using quick sort.

Q.2 Explain Prim's Algorithm with an appropriate example.

Q.3 Explain branch and bound methods used for backtracking.

Q.4 Write notes on the following -

(a) *Hamiltonian Cycle*

(b) *Traveling Salesman Problem*

Q.5 *Explain Divide and conquer technique. Write the steps of greedy algorithm.*
