

MCA-12

June – Examination 2024

MCA IInd Year Examination

Design and Analysis of Algorithm

Paper : MCA-12

Time : 3 Hours]

[Maximum Marks : 80

Note :- The question paper is divided into three Sections A, B and C. Write answers as per the given instructions.

Section-A

8×2=16

(Very Short Answer Type Questions)

Note :- Answer all questions. As per the nature of the question delimit your answer in one word, one sentence or maximum up to **30** words. Each question carries 2 marks.

1. (i) What is Complexity ?
- (ii) Define Heap Sort.

- (iii) What is Backtracking method ?
- (iv) What is Reducibility ?
- (v) What is 8-Queen problem ?
- (vi) What is Optimal Binary Search Tree ?
- (vii) Define Kruskal Algorithm.
- (viii) Define Dijkstra's algorithm.

Section-B **4×8=32**

(Short Answer Type Questions)

Note :- Answer any *four* questions. Each answer should not exceed **200** words. Each question carries 8 marks.

2. Explain the need of Analysis of Algorithm.
3. What is dividing and conquer strategy. Also explain merge sort.
4. What do you mean by Space-Time complexity ?
5. What is Greedy Strategy ? Also explain Knapsack problem.
6. What is circuit satisfiability problem ?
7. State and proof Cook's theorem.

8. What is non-deterministic algorithm ? How does it work ?
9. Explain the characteristics of dynamic programming.

Section-C **2×16=32**

(Long Answer Type Questions)

Note :- Answer any *two* questions. You have to delimit your each answer maximum up to **500** words. Each question carries 16 marks.

10. How does backtracking method find Hamiltonian cycle in a graph ?
11. Explain the travelling salesman problem with suitable example.
12. What is graph coloring problem ? What is the bounding condition for graph coloring problem ?
13. Discuss the branch and bound technique. In which situations we use this technique ?