Roll No. ....

67196

MCA 4th Semester CBCS Scheme

w.e.f. 2017-18

Examination – May, 2019

ANALYSIS AND DESIGN OF ALGORITHMS

Paper : 17MCA34DB1

Time : Three Hours]   *[Maximum Marks : 80*

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

Note : Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

1. (a) Explain general method of Divide & Conquer.

    $4 \times 4 = 16$

    (b) What is Asymptotic Analysis of an Algorithm ?

    (c) What is time complexity of an algorithm ?

    (d) Explain Live node, E-node and Dead Node in Branch & Bound method.

    (e) What is space complexity of an algorithm ?

    (f) Differentiate between Prim's and Kruskal's algorithm.

67196-658-(P-3)(Q-9)(19)   **P. T. O.**

(g) What is Linear Searching ?

(h) Differentiate between 0/1 knapsack & fractional knapsack ?

UNIT – I

2. (a) Write and explain quick sort algorithm using divide and conquer method.   10

    (b) Explain Recursive Binary search with an example.   6

3. Explain the following with example : $2 \times 8 = 16$

    (a) Sets and disjoint set and how to find connected components using disjoint data structures.

    (b) Explain Strassen's matrix multiplication with an example. https://www.haryanapapers.com

UNIT – II

4. (a) What is spanning tree ? Write the Kruskal's algorithm for minimum spanning tree. Explain with suitable example.   10

    (b) What is 0/1 knapsack problem using dynamic programming ? Explain with example.   6

5. (a) What do you know about single source paths ? Explain Dijkastra algorithm with example.   10

    (b) What is traveling salesperson problem ? Explain with example.   6

67196-   -(P-3)(Q-9)(19)   **(2)**

UNIT – III

6. (a) What is 8 queen's problem ? Explain with example.   8

   (b) What is graph coloring technique ? Explain with example.   8

7. (a) What do you understand branch and bound approach ? Explain traveling salesperson problem.   10

   (b) What is Hamiltonian cycle ? Explain.   6

UNIT – IV

8. (a) What is Fibonacci heaps ? Write and explain algorithm for Fibonacci heaps.   10

   (b) What is Red-Black tree ? Explain with example.   6

9. (a) Explain different NP scheduling problem.   6

   (b) What is B-tree ? Explain insertion & deletion on B-trees with example only.   10