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Total No. of Questions: 09

# M.Sc.(Computer Science) (2015 & Onwards) (Sem.-4) DESIGN & ANALYSIS OF ALGORITHMS

Subject Code: MSC-401 M.Code: 72419

Time: 3 Hrs. Max. Marks: 60

#### **INSTRUCTIONS TO CANDIDATES:**

- 1. SECTIONS-A, B, C & D contains TWO questions each, carrying TEN marks each and students have to attempt any ONE question from each SECTION.
- 2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.
- 3. Use of non-programmable scientific calculator is allowed.

#### **SECTION-A**

- 1) Discuss Asymptotic Notations with time space trade off.
- 2) Write an algorithm for Quick Sort with suitable example.

#### **SECTION-B**

- 3) Explain the need of spanning tress and also explain its different types.
- 4) Discuss All Pairs shortest paths algorithm in detail.

## **SECTION-C**

- 5) Discuss search techniques used for Graphs.
- 6) Explain how backtracking is helpful in 8-queens problem

## **SECTION-D**

- 7) Elaborate the need of fast Fourier Transformation.
- 8) Write a short note on NP-Hard Graph Problems.

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## **SECTION-E**

## 9) Write briefly:

- a) Explain Binary Search.
- b) Discuss Graph Coloring.
- c) Explain Tree representation using Array.
- d) What do you mean by Modular Arithmetic?
- e) Explain linear search.
- f) What do you mean by divide and conquer?
- g) Explain Hamiltonian cycles using example.
- h) Discuss Big-O Notation.
- i) Explain NP hard Problems.
- j) Explain different types of Graphs.

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

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