Please check that this question paper contains nine questions and two printed pages within first ten minutes.

[Total No. of Questions: 09] EVENING [Total No. of Pages: 02]

Univ. Roll No. ..... 03 DEC 2019

Program/Course: **B.Tech. (Sem. 5th)**
Name of Subject: **Design & Analysis of Algorithms**
Subject Code: **BTCS-503**
Paper ID: **A2099**

Time Allowed: 3 Hours **Max. Marks: 60**

NOTE:

1) **Section–A** is **compulsory.**
2) Attempt any **four** questions from **Section–B** and any **two** questions from **Section–C.**
3) Any missing data may be assumed appropriately.

Section – A

Q. 1. **[Marks: 02 each]**

(a) Define asymptotic time complexity.

(b) What is Minimum Cost Spanning Tree?

(c) Define the term "satisfiability" in terms of algorithms and problems.

(d) What do you know about inorder traversal of a graph?

(e) What is the time complexity of merge sort?

(f) Differentiate between deterministic and non-deterministic algorithm.

(g) What are hard problems?

(h) Define randomized algorithm.

(i) What is the difference between a decision problem and an optimization problem?

(j) What are convex hulls?

Section – B

[Marks: 05 each]

Q.2. Demonstrate the use of divide & conquer technique in quicksort.

Q.3. Explain Knuth-Morris-Pratt pattern matching algorithm.

Q.4. Differentiate between Breadth First Search (BFS) and Depth First Search (DFS).

Q.5. Write a note on approximation algorithms.

Q.6. Discuss Fast Fourier Transform (FFT) and its applications.

Section – C **[Marks: 10 each (05 for each subpart, if any)]**

Q.7. Design a greedy method to solve knapsack problem.

Q.8. Write a detailed note on Bellman and Ford Algorithm to compute shortest path.

Q.9. Discuss the theory of NP-completeness.

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