M.Tech. (CSE Engg.) (2018 Batch)　(Sem.–1)
MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
Subject Code : MTCS-101-18
M.Code : 75153

Time : 2 Hrs.   **Max. Marks : 30**
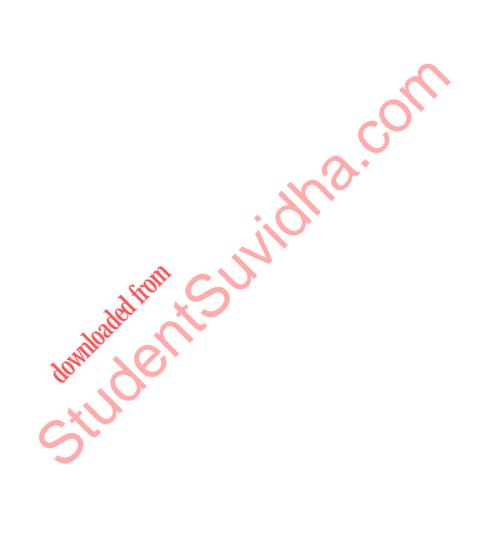
INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE question(s), each question carries 6 marks.**

1. What does a measure of central tendency indicate? Describe the important measures of central tendency pointing out the situation when one measure is considered relatively appropriate in comparison to other Measures.

2. What do you understand by isomorphism in graph theory, explain.

3. The lengths of time, in minutes, that 10 patients waited in a doctor's office before receiving the treatment are recorded as follows : 5, 11, 9, 5, 10, 15, 6, 10, 5 and 10. Treating the data as random sample, find :

   a. The range

   b. The standard deviation

4. What is a regression problem? How it is solved?

5. Explain the following concepts in relation to graph theory (**any two**) :

   a. Differentiate between isolated and connected graphs.

   b. What is bipartite graph?

   c. Differentiate between directed and undirected graphs.

6. Why does a small sample size cause problems? When is the Central Limit Theorem needed? How big does the sample have to be for the Central Limit Theorem?

7. What are the recent trends in various distributions functions in mathematical field of computer science in bioinformatics?

8. Write short notes on :

   a. Mathematical applications in machine learning.

   b. Applications in computer security.