

M.Sc. I.T. Sem - IV (60:40) date - 14/01/2025

(Time: 2 Hours)

[Total Marks: 60]

N. B.: (1) All questions are compulsory.

(2) Make suitable assumptions wherever necessary and state the assumptions made.

(3) Answers to the same question must be written together.

(4) Numbers to the right indicate marks.

(5) Draw neat labeled diagrams wherever necessary.

(6) Use of Non-programmable calculators is allowed.

**Q1. Attempt the Two of the following.**

**12 Marks**

- Briefly explain Arithmetic operations on scalar with example.
- What is Symmetric Matrix and Orthogonal Matrix, Compare with example
- What is Eigenvectors and Eigenvalues, explain with example
- Give an example of Inverse matrix and provide the importance of that.

**Q2. Attempt Two of the following**

**12 Marks**

- What is the importance of Gradient Optimization give its example?
- Define Local minimum, explain in detail.
- What is Saddle point and How to determine if a point is a saddle point?
- Write note on Poor Conditioning.

**Q3. Attempt Two of the following.**

**12 Marks**

- What Simple Deep Neural Network? Explain with Example.
- Discuss Gradient-Based Learning with example?
- What is Dropout. Explain in details?
- Explain Challenges in Neural Network Optimization.

**Q4. Attempt Two of the following.**

**12 Marks**

- What is convolution neural network? How it is different from neural network.
- What is Pooling? Explain the role of pooling.
- Give comparison between recurrent neural network and convolutional neural network.
- Give difference between CNN and RNN.

**Q5. Attempt Two of the following.**

**12 Marks**

- Explain the mechanism of sequence modelling.
- Explain the classification process using sequence modelling.
- Explain the architecture of RNN.
- Write a short note on Applications using Word Embeddings

\*\*\*\*\*