

Time: 2 ½ Hours

Total Marks: 75

- 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 labelled diagrams wherever necessary.
 - (6) Use of Non-programmable calculators is allowed.

Q1. Attempt any three of the following:

15 Marks

- a. What is Matrix and explain matrices addition.
- b. What is a need of Gradient Optimization and Explain in detail?
- c. Explain Eigenvectors and Eigen values.
- d. Explain Minimum, Maximum and Saddle point.
- e. Write Properties of dot products.

Q2. Attempt any three of the following:

15 Marks

- a. Define and Explain Data Augmentation.
- b. Explain the term local minima with the help of diagram.
- c. What is Simple Deep Neural Network? Explain with Example.
- d. What is sequence modelling? State its applications.
- e. What is Dropout? Explain in detail.

Q3. Attempt any three of the following:

15 Marks

- a. What is convolution neural network? How it is different from neural network.
- b. Explain different types of data used in Convolution Neural Network.
- c. Differentiate between CNN & RNN.
- d. Explain the max, min & average pooling in brief.
- e. Explain deep learning applications with reference to Natural Language Processing.

Q4. Attempt any three of the following:

15 Marks

- a. What is Sparse coding?
- b. What are auto encoders & decoders? State its applications.
- c. What is the significance of Denoising Autoencoders?
- d. What is Manifold Interpretation of PCA?
- e. Write a short note on the importance of Representation learning in deep learning.

Q5. Attempt any three of the following:

15 Marks

- a. Explain Conditional GANs.
- b. Explain how approximate Inference works in machine learning?
- c. Explain Deep Belief Networks with its working.
- d. Compare Supervised and Unsupervised Learning. Give one example.
- e. Write Maximum a Posteriori (MAP) algorithm
