

Duration: 3hrs

[Max Marks: 80]

- N.B.:** 1) Question No 1 is Compulsory.  
(2) Attempt any three questions out of the remaining five.  
(3) All questions carry equal marks.  
(4) Assume suitable data, if required and state it clearly.

**1** Attempt any **FOUR** [20]

- a Differentiate between Linearly separable and linearly non-separable classes.
- b Write short notes on: Biological Neuron
- c Design AND gate using Mc-culloch Pitt Model
- d What are the various steps involved in Back propagation Algorithm?
- e Explain the need of drop out regularization in deep learning?

**2** a Compare Batch Gradient Descent and Stochastic Gradient Descent algorithm [10]

b Compare L1 and L2 regularization. [10]

**3** a Explain the different layers and function of each layer in CNN. [10]

**Let us consider a Convolutional Neural Network having three different convolutional layers in its architecture as –** [10]

b Layer-1: Filter Size – 3 X 3, Number of Filters – 10, Stride – 1, Padding – 0

Layer-2: Filter Size – 5 X 5, Number of Filters – 20, Stride – 2, Padding – 0

Layer-3: Filter Size – 5 X5, Number of Filters – 40, Stride – 2, Padding – 0

If we give the input a 3-D image to the network of dimension 39 X 39, then determine the dimension of the vector after passing through a fully connected layer in the architecture.

**4** a Explain the architecture of RNN in detail? What are the problems associated with RNN? [10]

b Explain the architecture of LSTM in detail. [10]

- 5 a Explain the architecture of Autoencoder and various applications of auto encoder. [10]
- b Explain regularization in case of autoencoders? Explain architecture of SPARSE auto encoder? [10]
- 6 Write Short Note (Any Two) [20]
- A) GAN Architecture
- B) Brain tumor detection using GAN
- C) LeNet Architecture
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