

END TERM EXAMINATION

SIXTH SEMESTER [BCA] MAY-JUNE, 2025

Paper Code: BCAT-314

Subject: Deep Learning with Python

Time: 3 Hours

Maximum Marks: 75

Note: Attempt all questions as directed. Internal choice is indicated.

- Q1 Attempt **any five** of the following questions: (5x5=25)
- (a) What is a Perceptron model in Machine Learning?
 - (b) Explain the use of an activation function in detail.
 - (c) Distinguish between deep and shallow networks.
 - (d) Discuss different techniques for hyper parameter optimization.
 - (e) How does an auto encoder work, explain. Define latent space.
 - (f) Explain the concept of feature extraction.
 - (g) What is a transfer learning?
 - (h) Explain two problems that can be solved by using LSTM model.
- Q2 (a) Define batch normalisation. Why should we use Batch Normalization? (5)
- (b) Write notes on **any three** of the following: (7.5)
- (i) Tensor (ii) Loss function (iii) Hidden layer of an ANN
 - (iv) Vanishing gradient problem (iv) Parameter sharing
- OR**
- Q3 (a) Define backpropagation in deep learning? Cite some advantages and limitations of back propagation. (6)
- (b) Discuss some major activation functions of neural network. (6.5)
- Q4 Explain the functions of all the basic layers of a Convolution Neural Network. (12.5)
- OR**
- Q5 (a) What is a regularization technique? Which regularisation techniques are used in CNN to prevent over fitting, explain. (5.5)
- (b) Explain the CNN architectures: LeNet and GoogLeNet (7)
- Q6 (a) What are deep belief networks? Define the following terms: (6.5)
Restricted Boltzmann Machines (RBMs), Layer-wise Training, and Stochastic Units.
- (b) Define autoencoders. Explain major types of autoencoders. (6)
- OR**
- Q7 Describe reinforcement learning in details. List the advantages and disadvantages of reinforcement learning. (12.5)
- Q8 What are Recurrent Neural Networks? Explain its major types. (12.5)
- OR**
- Q9 (a) Write notes on **any two** of the following: (4x2=8)
- (i) Sequence prediction problem,
 - (ii) Differences between RNN and LSTM.
 - (iii) Object detection techniques of deep learning (iv) Deepfake AI
- (b) Describe a brief note on architecture of LSTM. (4.5)

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