



CBCS SCHEME

--	--	--	--	--	--	--	--	--	--

18AI81

Eighth Semester B.E. Degree Examination, June/July 2024 Neural Networks and Deep Learning

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With respect to reverse mode autodiff in tensor flow, explain the main benefits and drawbacks of creating a computation graph rather than directly executing the applications. (06 Marks)
- b. Explain the steps required to feed the data to the training algorithm in tensor flow. (04 Marks)
- c. With code snippet, explain the following :
 - i) Modularity and sharing variables in Tensor flow
 - ii) Save and restore the models in tensor flow. (10 Marks)

OR

- 2 a. With code snippet explain two different phases while training a DNN using tensor flow. (10 Marks)
- b. With a neat diagram explain the architecture of a multilayer perceptron. (10 Marks)

Module-2

- 3 a. With the code snippet and equations discuss Xavier and the initialization pertaining to vanishing/exploding gradients problem. (10 Marks)
- b. With the code snippet, explain Leaky Relu, a non saturating activation function related to vanishing gradient problem. (10 Marks)

OR

- 4 a. Write a note on Batch Normalization and Gradient clipping which supports exploding gradients problem. (10 Marks)
- b. With an example, discuss how tweaking, dropping or replacing the upper layers helps in improving the performance of DNN model. (10 Marks)

Module-3

- 5 a. Illustrate asynchronous communication using Tensor flow Queues with code snippet and diagram. (10 Marks)
- b. Briefly explain with a diagram, parallelizing neural networks on a Tensor flow cluster on condition of one neural network per device. (10 Marks)

OR

- 6 a. Discuss convolutional layer features with a diagram and explain the methods for stacking multiple features maps. (10 Marks)
- b. What are pooling layers, explain Tensor flow implementations of pooling layers with a diagram and code. (10 Marks)

Module-4

- 7 a. Explain Recurrent Neural Networks and describe output of a recurrent layer for a single instance as well as all instances in a mini batch. (10 Marks)

- b. With respect to Basic RNNs in tensor flow, write a note on:
i) Static unrolling through time.
ii) Dynamic unrolling through time. (10 Marks)

OR

- 8 a. With diagram and code snippet explain the steps required for training to predict time series in RNN. (10 Marks)
b. With LSTM cell diagram, explain LSTM computations features. (10 Marks)

Module-5

- 9 a. Discuss performing Principle Component Analysis (PCA) with an under complete linear autoencoder code. (10 Marks)
b. Briefly explain Sparse Autoencoders and denoising autoencoders with a neat diagram. (10 Marks)

OR

- 10 a. With a neat diagram and code snippet, describe the features of Neural Network policies. (10 Marks)
b. Summarize the application features of Markov Decision Processes with respect to Bellman optimality equation and values iteration algorithm. (10 Marks)

* * * * *