CBCS SCHEME

USN | | | | | | | | | | |

18AI81

Eighth Semester B.E./B.Tech. Degree Examination, June/July 2025
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. What is Tensor Flow, with an example explain how parallel computations are done on multiple CPUS/GPUS. **(10 Marks)**

b. What is Back propagation and how does it work? Contrast the working features of back propagation and reverse – mode autodiff. **(10 Marks)**

OR

2 a. Why is logistic activation function a key ingredient in training the multi-layer perceptions? **(04 Marks)**

b. Explain the following activation function and with respect to multi-layer preceptors.
i) Rectified linear unit function
ii) Hyperbolic tangent (tanh) function. **(08 Marks)**

c. With a neat diagram and equations explain linear threshold unit and perception learning rule. **(08 Marks)**

Module-2

3 a. Discuss how Batch Normalization algorithm helps to vanishing gradient problem. **(10 Marks)**

b. Differentiate the techniques involved in freezing the lower layers and catching the frozen layers. **(10 Marks)**

OR

4 a. With a neat diagram and code snippet discuss DNN-reusing pertained layers in a tensor flow model. **(10 Marks)**

b. With equations, list and explain different faster optimizers used in deep neural network model. **(10 Marks)**

Module-3

5 a. With a diagram illustrate the steps required for parallel execution of multiple devices across multiple servers. **(10 Marks)**

b. With code snippet and diagram, explain the methods required for asynchronous communication using tensor flow queues. **(10 Marks)**

OR

6 a. With a neat diagram, explain the architecture of the visual cortex and discuss its features related to CNN. **(10 Marks)**

b. Define CNN, with a neat diagram end code snippet explain tensor flow implementation for CNN layers. **(10 Marks)**

Module-4

7 a. With the code snippet contrast briefly the advantages of building on RNN using dynamic_rmn( ) rather than static _rnn( ). **(10 Marks)**

b. With respect to RNNs write a note on :
i) Handling variable length input sequences
ii) Handling variable length output sequences
iii) Basic RNNs in Tensor flow. **(10 Marks)**

OR

8 a. With the code snippet and diagram explain the features of creative RNN and Deep RNN. **(10 Marks)**

b. What is gated recurrent unit cell, with a diagram and its computations explain GRU cell. **(10 Marks)**

Module-5

9 Explain the following with suitable diagram :
a. Unsupervised pertaining using stacked autoencoders
b. Training one auto-encoder at a time
c. Sparse auto encoders
d. Denoising auto-encoders. **(20 Marks)**

OR

10 a. With respect to policy gradients describe REINFORCE algorithm with steps and code snippet. **(10 Marks)**

b. With code snippet and equation explain temporal different Learning and Q-Learning algorithm. **(10 Marks)**

* * * * *