CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐ 21CS743

Seventh Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025

Deep Learning

Time: 3 hrs. Max. Marks: 100

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

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Explain the concept of tasks(T), Performance (P) and Experience (E). Describe the following with respect to tasks performance and experience.
   i) Checker learning problem
   ii) Handwriting recognition learning problem **(12 Marks)**

b. Explain the concept of supervised and unsupervised learning with example. **(08 Marks)**

OR

2 a. Explain the historical trends in deep learning. **(10 Marks)**

b. Define supervised and unsupervised learning algorithm. Describe KNN and K means algorithm. **(10 Marks)**

Module-2

3 a. Explain about gradient based learning. **(10 Marks)**

b. Explain the concept of Back propagation and how it helps in a Neural network. **(10 Marks)**

OR

4 a. Define Regularization. Describe L^1 and L^2 regularization. **(10 Marks)**

b. Given $W = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$, $C = \begin{bmatrix} 0 \\ -1 \end{bmatrix}$, $W = \begin{bmatrix} 1 \\ -2 \end{bmatrix}$ and $b = 0$ draw feed forward network and evaluate XOR function. **(10 Marks)**

Module-3

5 a. What are the challenges in neural network optimization? **(10 Marks)**

b. Explain the following algorithms
   i) RMSProp
   ii) RMSProp with momentum. **(10 Marks)**

OR

6 a. Explain stochastic gradient descent and momentum algorithms **(10 Marks)**

b. Give the list of adaptive learning rates algorithms. Write the Ada Grad algorithm. **(10 Marks)**

Module-4

7 a. Explain the following with suitable diagram.
i) Sparse interactions ii) Parameter sharing. **(10 Marks)**

b. Explain briefly variant of the CNN models. **(10 Marks)**

OR

8 a. Differentiate locally connected layers, tiled convolution and standard convolution with suitable example and diagram. **(10 Marks)**

b. Explain the different layers in CNN models and its function with a neat diagram. **(10 Marks)**

Module-5

9 a. Discuss about Bidirectional Recurrent neural networks. **(10 Marks)**

b. What is speech recognition? Explain the different types of speech recognition systems. **(10 Marks)**

OR

10 a. Explain Long Short-Team Memory (LSTM) working principles along with all the equations. **(10 Marks)**

b. What is Natural language processing? Explain different steps involved in NLP. **(10 Marks)**

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