**III B. TECH II SEMESTER REGULAR EXAMINATIONS APRIL - 2023**

**DEEP LEARNING**

**(CSE – ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)**

Time: 3 hours Max. Marks: 70

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Note:** Answer **ONE** question from each unit **(5 × 14 = 70 Marks)**

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

|  |  |  |  |
| --- | --- | --- | --- |
| UNIT-I | | | |
| 1. | a) | Give an example of learning XOR function to describe a fully functioning feed forward network. | [7M] |
| b) | What is an activation function and why to use them. | [7M] |
| (OR) | | | |
| 2. | a) | Compare fed forward and fed backward networks. | [7M] |
| b) | Why convergence is not guaranteed for back propagation algorithm. | [7M] |
| UNIT-II | | | |
| 3. | a) | Describe the ill- conditioning problem in neural network optimization. | [7M] |
| b) | Discuss the advantages of L1 regularization over L2 regularization. | [7M] |
| (OR) | | | |
| 4. | a) | Illustrate the RMSProp algorithm. | [7M] |
| b) | Why do we need better optimization algorithm? Illustrate AdaGrad optimization strategy. | [7M] |
| UNIT-III | | | |
| 5. | a) | Illustrate the operation of pooling layer in CNN with simple example. | [7M] |
| b) | Differentiate artificial neural networks and convolutional neural networks. | [7M] |
| (OR) | | | |
| 6. | a) | Draw the architectures of AlexNet, VGGnet and single ResNet block. | [7M] |
| b) | What does bias do in deep learning? How the weights and bias are updated in neural network? | [7M] |
| UNIT-IV | | | |
| 7. | a) | How early stopping acts as a regularizer. | [7M] |
| b) | What is dropout and why is it used? Discuss the benefits of dropout in deep neural networks. | [7M] |
| (OR) | | | |
| 8. | a) | What are the different normalization layers in deep learning? Illustrate group normalization in detail. | [7M] |
| b) | Why data augmentation is important in image classification? List the different types of data augmentation techniques. Explain any two techniques in detail. | [7M] |
| UNIT-V | | | |
| 9. | a) | Draw the architecture of LSTM and explain its application. | [7M] |
| b) | Differentiate deep learning and natural language processing. | [7M] |
| (OR) | | | |
| 10. | a) | What is RNN? Draw its architecture and explain the difficulties in training them. | [7M] |
| b) | With a suitable example explain the process of CBOW word2vec model. | [7M] |

**\* \* \* \* \***