

## 19EC503 – ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

### POSSIBLE QUESTIONS

#### UNIT - 5 (2 MARKS)

1. What is a Convolutional Neural Network (CNN), and what type of data is it primarily used for?
2. Explain the role of convolutional layers in CNNs. How do they differ from fully connected layers?
3. Define a Recurrent Neural Network (RNN) and explain its main advantage over traditional feedforward neural networks.
4. What are the challenges associated with training RNNs, and how do they impact learning from sequential data?
5. What is a Bidirectional RNN, and how does it enhance the performance of standard RNNs?
6. In what scenarios would you prefer using a Bidirectional RNN over a standard RNN? Provide a brief explanation.
7. What distinguishes Deep Recurrent Networks from traditional RNNs? Discuss their potential benefits.
8. Describe a common application of Deep Recurrent Networks and how they improve upon basic RNN architectures.
9. What is a Recursive Neural Network, and how does it differ from a standard RNN?
10. In what contexts are Recursive Neural Networks particularly useful? Provide an example.
11. How are neural networks applied in speech recognition systems? Briefly explain their role in converting speech to text.
12. What are some challenges faced by speech recognition systems that utilize neural networks?

#### DETAILED QUESTIONS:

1. Describe the main components of Convolutional Neural Networks (CNNs). Explain how each component (convolutional layers, pooling layers, and fully connected layers) contributes to image classification. Provide examples of tasks where CNNs are used.
2. Explain what Recurrent Neural Networks (RNNs) are and how they process sequential data. Discuss the main advantages of using RNNs for tasks like time series prediction and language modeling. What are some common challenges faced when training RNNs?

3. What are Bidirectional Recurrent Neural Networks (BRNNs)? Discuss how they improve the performance of traditional RNNs by using information from both past and future data. Provide examples of applications where BRNNs are beneficial.
4. Define Deep Recurrent Networks (DRNNs). Explain how they differ from standard RNNs and why having multiple layers can be advantageous for modeling complex patterns. Give examples of applications where DRNNs are used effectively.
5. What are Recursive Neural Networks (RecNNs), and how do they differ from RNNs? Discuss their ability to handle structured data, such as trees. Provide examples of how RecNNs can be applied in natural language processing tasks.
6. Discuss how neural networks are used in speech recognition systems. Explain the roles of CNNs and RNNs in converting speech to text. What challenges do these systems face, and what are some successful applications of speech recognition technology?