Total No. of Questions : 8]

SEAT No. :

PB-2509

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B.E. Artificial Intelligence and Data Science

DEEP LEARNING

(2019 Pattern) (Semester - VIII) (417532D) (Elective - V)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer four questions Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Assume suitable data if necessary.***

Q1) a) What is pooling in CNNs? Why is it used? Explain the difference between max pooling and average pooling. **[9]**

b) How do you determine the number of filters in each convolutional layer? **[5]**

c) Define convolutional neural network (CNN), and how does it differ from other types of neural networks? **[4]**

OR

Q2) a) Explain the concept of padding in CNNs. Why is it used? What are strides in CNNs? **[9]**

b) Describe the typical architecture of a CNN. **[5]**

c) What is the main purpose of using CNNs in deep learning? **[4]**

Q3) a) What are some common performance metrics used to evaluate RNNs? How do these metrics differ for different applications of RNNs? **[9]**

b) Describe the long short-term memory (LSTM) unit and its components. **[8]**

OR

Q4) a) What is the difference between recurrent neural networks (RNNs) and feedforward neural networks? **[8]**

b) What are hyperparameters in the context of neural networks? How do researchers select appropriate hyperparameters for training RNNs? **[9]**

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Q5) a) What is a generative adversarial network (GAN), and how does it work to generate realistic synthetic data? **[9]**

b) Describe different types of GANs, How do these types of GANs differ in their architecture and training? **[9]**

OR

Q6) a) How are deep generative models used in machine learning and artificial intelligence? **[8]**

b) What are some common challenges of using GANs, and how can they be addressed in practice? **[7]**

c) What are some applications of GANs in computer vision? **[3]**

Q7) a) How can reinforcement learning be applied to play Tic-Tac-Toe? What are the key components of a reinforcement learning algorithm for playing Tic - Tac. **[8]**

b) What is deep reinforcement learning, and how does it combine deep learning with reinforcement learning? **[9]**

OR

Q8) a) Explain the concept of a Markov Decision Process. What are the main components of an MDP? **[6]**

b) Describe the architecture of a deep Q recurrent network. **[6]**

c) What are some of the main challenges faced in reinforcement learning? **[5]**

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