Total No. of Questions : 8]

SEAT No. :

P440

[Total No. of Pages : 2

[6003]-544

T.E. (Artificial Intelligence and Data Science)

ARTIFICIAL NEURAL NETWORK

(2019 Pattern) (Semester - II) (317531)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.*
2) *Neat diagram must be drawn wherever necessary.*
3) *Figures to the right indicate full marks.*
4) *Assume suitable data if necessary.*

Q1) a) What is the Hopfield neural network? What is a state transition diagram for Hopfield Neural Network? Explain how to derive it in Hopfield model. **[8]**

b) Explain the concept of associative learning in artificial neural networks. How is it related to pattern recognition? **[6]**

c) Explain the architecture of Boltzmann machine. **[4]**

OR

Q2) a) Describe the Boltzmann machine and Boltzmann learning law. What are the limitations of the Boltzmann learning? **[8]**

b) Write a short note on **[10]**

i) Stochastic Network

ii) Simulated Annealing

Q3) a) Draw and explain Competitive learning Network. **[7]**

b) Describe the self-organization map (SOM) algorithm and explain how it can be used for feature mapping. **[6]**

c) Explain how ART can be used for character recognition task. **[4]**

OR

Q4) a) Explain briefly ART network. What are the features of ART network? **[7]**

b) Describe the components of a competitive learning neural network and explain how they contribute to the network function. **[6]**

c) What is vector quantization? How it is used for pattern clustering? **[4]**

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Q5) a) Explain the role of pooling layer in Convolution neural network. **[8]**

b) Explain the concept of transfer learning and its importance in deep learning. **[6]**

c) Explain Padding in neural network. **[4]**

OR

Q6) a) Explain Residual network in Convolution neural network. **[8]**

b) Explain the concept of SoftMax regression and its significance in CNN models. **[10]**

Q7) a) Explain how ANN can be used for the recognition of printed characters. **[7]**

b) Describe the Neocognitron model and its significance in the recognition of handwritten characters. **[6]**

c) Explain example of pattern recognition in everyday life. **[4]**

OR

Q8) a) Discuss the application of ANN in pattern classification and recognition of Olympic game symbols. **[7]**

b) Explain texture classification and segmentation in ANN. **[6]**

c) Discuss the application of ANN in the recognition of consonant vowel (CV) segments. **[4]**

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