Total No. of Questions : 8]

SEAT No. :

P7558

[Total No. of Pages : 2

[6180]-70
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) ***Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume Suitable data if necessary.***

Q1) a) What do you understand by associative memory? Also mention characteristics and applications for the same. **[5]**

b) Write short Notes on the following. **[5]**

i) State transition diagram

ii) False minima problem

c) Illustrate the architecture of Boltzmann machine and its learning also its applications. **[8]**

OR

Q2) a) Explain Boltzmann machine. How does it differ from Hopfield net? **[8]**

b) How does simulated annealing algorithm work? **[5]**

c) Write short notes on the following. **[5]**

i) Applications of Hopfield Network for Travelling sales man problem

ii) Associative Memory

Q3) a) What is competitive learning in neural networks? **[5]**

b) Consider an ART-I network with input vector [1,1,0,0], [0,0,1,0], [1,1,1,0] and [1,1,1,1], want to produce clustering with following data, number of inputs n =4, clusters to be formed m = 3 and vigilance parameter $\rho = 0.5$, Compute the result of the first iteration and comment on clustering. **[8]**

c) Draw the network architecture of ART network. Explain the algorithm for designing the weights of ART network. **[5]**

OR

P.T.O.

Q4) a) Explain ART under the following headings : **[5]**

i) Architecture
ii) Working
iii) Training
iv) Implementation

b) Draw the architecture of Kohonen Network and explain the algorithm for training the weights of the Network. **[5]**

c) Define following : **[8]**

i) Learning vector quantization
ii) Adaptive pattern classification

Q5) a) Illustrate with example convolution and max pooling? **[6]**

b) What frameworks are used in deep learning? Define any seven. **[5]**

c) Explain the softmax regression with respect to hypothesis and cost function and write down its properties. **[6]**

OR

Q6) a) Exemplify convolution over volume with convolution on RGB images. Also illustrate multiple filters used in it. **[6]**

b) Consider a LeNet-5 a convolutional neural network, we want to perform the classification of digits, Write down the complete procedure followed in its architecture. **[5]**

c) What is transfer learning models for image classification? What are the 5 types of transfer learning? **[6]**

Q7) a) Which device recognize a pattern of handwritten or printed characters? And also illustrate it's working. **[7]**

b) Explain texture classification using convolution neural network. **[5]**

c) Write short notes on the following: **[5]**

i) NET Talk
ii) Texture classification
iii) Pattern classification

OR

Q8) a) You have been asked to develop a model of recognizing hand written digits. What are the chosen steps for activity? Explain each with detail. **[7]**

b) What is automatic translation? How does it work? What are its benefits? **[5]**

c) What is neocognitron neural network and how it is trained? **[5]**