SAMPLE PAPER

Examinations Commencing from 07th January 2021 to 20th January 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELXDLO7031 and Course Name: Neural Networks and Fuzzy Logic

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	The value of bipolar sigmoid transfer function used in neural network varies in the range
Option A:	(-1,1)
Option B:	(0,1)
Option C:	(-2,2)
Option D:	(-10,10)
2.	About ____ number of synaptic interconnections are there in a human brain
Option A:	10^{11}
Option B:	10^{13}
Option C:	10^{15}
Option D:	10^{17}
3.	For perceptron learning rule,the learning signal is
Option A:	The desired response
Option B:	The actual response
Option C:	The difference between the desired response and actual neuron's response
Option D:	The product of the desired response and actual neuron's response
4.	Widrow-Hoff learning rule is a
Option A:	Supervised learning rule
Option B:	Unsupervised learning rule
Option C:	Competitive learning rule
Option D:	Hebbian learning rule

5.	Radial Basis Function network uses which of the following activation function
Option A:	Ramp function
Option B:	Binary Step function
Option C:	Bipolar Step function
Option D:	Gaussian kernel function
6.	What is the form of Fuzzy logic?
Option A:	Two-valued logic
Option B:	Crisp set logic
Option C:	Many-valued logic
Option D:	Binary set logic
7.	In this competitive net the weights remain fixed, even during training process.
Option A:	Perceptron
Option B:	Adaline
Option C:	Mexican hat
Option D:	BPN
8.	Hopfield network is
Option A:	An autoassociative neural network
Option B:	A hetroassociative network
Option C:	A self organizing network
Option D:	A perceptron network
9.	In competitive learning, the winning neuron has
Option A:	The maximum Euclidean distance between the input vector and weight vector
Option B:	The minimum Euclidean distance between the input vector and weight vector
Option C:	Euclidean distance equal to 1
Option D:	The minimum dot product of the input vector and weight vector

10.	What are the steps for using a gradient descent algorithm? 1. Calculate error between the actual value and the predicted value 2. Repeat until you find the best weights of network 3. Pass an input through the network and get values from output layer 4. Initialize random values for weight and bias 5. Go to each neurons which contributes to the error and change its respective values to reduce the error
Option A:	4,3,1,5,2
Option B:	1,2,3,4,5
Option C:	3,4,5,2,1
Option D:	2,3,4,5,1
11.	The Lambda –cut set for λ=0.9 for the given fuzzy set A ={(a, 1),(b,0.3),(c,0.6),(d,0.9),(e,0.2) }
Option A:	{(a,1),(b,0.3),(c,1),(d,1),(e,1)}
Option B:	{(a,1),(b,0),(c,0),(d,1),(e,0)}
Option C:	{(a,0),(b,1),(c,0),(d,0),(e,1)}
Option D:	{(a,0.9),(b,0.9),(c,0.9),(d,1),(e,0.9)}
12.	The memory capacity of BAM is given as (where n is the no. of units in X layer and m is the no. of units in Y layer)
Option A:	Min(m,n)
Option B:	Max(m,n)
Option C:	m
Option D:	n
13.	The network used to retrieve a stored pattern when a corrupted version of stored pattern is presented.
Option A:	Maxnet
Option B:	Boltzmann network
Option C:	Hopfield network
Option D:	Hebb network
14.	An English to Spanish translation system performs
Option A:	Auto association
Option B:	Hetro association
Option C:	Pattern recognition

Option D:	Pattern matching
15.	Reflexivity ,Symmetry and transitivity properties are satisfied by
Option A:	Fuzzy tolerance relation
Option B:	Fuzzy Equivalence relation
Option C:	Fuzzy composition relation
Option D:	Fuzzy inference relation
16.	In an Adaline, the input-output relationship is _____
Option A:	Non-linear
Option B:	Linear
Option C:	Exponential
Option D:	Logarithmic
17.	Which of the following can be used for classification of data?
Option A:	Single layer perceptron
Option B:	LVQ
Option C:	Self organizing maps
Option D:	MAXNET
18.	The core of a membership function for a fuzzy set A is defined as
Option A:	Region of universe containing elements that have a non zero but not complete membership
Option B:	Region of universe characterized by complete membership in the fuzzy set.
Option C:	Region of universe characterized by non zero membership
Option D:	Region of universe characterized by membership vale of the complement of the fuzzy set.
19.	What does vigilance parameter in ART determines?
Option A:	number of possible outputs
Option B:	number of desired outputs
Option C:	number of acceptable inputs

Option D:	the tolerance of matching process
20.	Sequence of steps in designing a fuzzy logic machine is:
Option A:	Fuzzification,Rule evaluation,Defuzzification
Option B:	Rule evaluation,Fuzzification,Defuzzification
Option C:	Fuzzy Sets,Defuzzification,Rule evaluation
Option D:	Defuzzification,Rule evaluation,Fuzzification

Q2. **(20 Marks Each)**	**Solve any Two Questions out of Three 10 marks each**
A	Use single layer discrete perceptron training rule for implementing AND function for bipolar inputs and target. Repeat for two epochs.
B	Explain Learning Vector Quantization algorithm.
C	Construct an autoassociative network to store the vectors X1=[1 1 1 1 1], X2=[1 -1 -1 1 -1], X3=[-1 1 -1 -1 -1]. Find the weight matrix with no self connection and calculate the energy of the stored patterns. Using discrete Hopfield network test the patterm S=[1 1 1 -1 1].

Q3. **(20 Marks Each)**	**Solve any Two Questions out of Three 10 marks each**
A	Explain Adaline network Training algorithm.
B	Two fuzzy sets are defined as: A= $\{\frac{1}{2}+\frac{0.3}{4}+\frac{0.5}{6}+\frac{0.2}{8}\}$ B= $\{\frac{0.5}{2}+\frac{0.4}{4}+\frac{0.1}{6}+\frac{1}{8}\}$ Perform union, intersection , bounded difference, bounded sum, complement.
C	Explain the training algorithm Kohonen self organizing feature maps with neat architecture.