University of Mumbai
Examination Summer 2022

Time: 2 hour 30 minutes 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.	Select the incorrect statement among the following
Option A:	Regression has output variable as categorical.
Option B:	Regression has output variable as a real value, e.g “height” or “weight”.
Option C:	Supervised learning requires output labels
Option D:	Classifier has output variable as a category, e.g. “spam” or “nonspam”
2.	Synapse are responsible for
Option A:	the site of transmission of electric nerve impulses between two nerve cells
Option B:	sending signals outside biological neuron
Option C:	processing signals
Option D:	storing signals
3.	What are the issues on which biological networks proves to be superior than AI networks?
Option A:	robustness
Option B:	Non-flexibility
Option C:	Non- fault tolerance
Option D:	Non-collective computation
4.	Adaline ……
Option A:	has a linear decision boundary
Option B:	cannot learn iteratively
Option C:	don’t use a threshold function
Option D:	has nonlinear decision boundary
5.	The first computational model of a neuron is ……..
Option A:	MuCulloch Pitts
Option B:	perceptron
Option C:	Adaline
Option D:	Madaline
6.	The distance is long. Here the word long in Fuzzy theory is known as
Option A:	linguistic variable
Option B:	nonlinguistic variable
Option C:	mixed variable
Option D:	complex variable
7.	The region of universe that is characterized by complete membership in the set is called
Option A:	Core
Option B:	Support

Option C:	Boundary
Option D:	Fuzzy
8.	Binary logic is……..and Fuzzy logic is…..
Option A:	Two-valued logic, Many-valued logic
Option B:	Many-valued logic ,Crisp set logic
Option C:	Crisp set logic, Many-valued logic
Option D:	Many-valued logic ,Binary set logic
9.	MLP neural network can have ……
Option A:	one or more hidden layers
Option B:	No input layer
Option C:	No hidden layers
Option D:	No output layer
10.	A 4-input neuron has weights 2, 1, 1 and 1. The inputs are 1, 2, 3 and 4 respectively. The activation function is identity function The output will be:
Option A:	10
Option B:	11
Option C:	20
Option D:	12

Q2 (20 Marks Each)	
A	**Solve any Two** **5 marks each**
i.	Explain the training algorithm used for RBFN.
ii.	Explain perceptron learning rule in detail.
iii.	With examples explain the working of heteroassociative memory.
B	**Solve any One** **10 marks each**
i.	Explain in detail steps of backpropogation algorithm
ii.	Explain any two defuzzification methods.
Q3 (20 Marks Each)	
A	**Solve any Two** **5 marks each**
i.	With neat sketch differentiate supervised and unsupervised learning processes of Neural network
ii.	What do you mean by crisp set and fuzzy set? Explain difference between them .Give examples.
iii.	Write a short note on McCulloch Pitts neuron model
B	**Solve any One** **10 marks each**
i.	Explain perceptron convergence Theorem
ii.	Why bias, activation function is used in Artificial neuron? Explain different activation functions.
Q4 (20 Marks Each)	
A	**Solve any Two** **5 marks each**

i.	What does vigilance parameter in ART determine? How can ART network solve the stability plasticity dilemma?
ii.	Differentiate the working principles of supervised and unsupervised learning.
iii.	How multilayer feed forward networks can be used to solve linearly inseparable functions? Explain
B	**Solve any One** **10 marks each**
i.	What is KSOM in neural networks? Why Kohonen networks are called as self organized feature maps? What are the five stages in self organizing map?
ii.	What is Fuzzification? How Fuzzification converts crisp set into fuzzy set? What are different methods of doing it?