GIET UNIVERSITY, GUNUPUR – 765022
B. Tech (Fifth Semester – Regular) Examinations, November – 2022
BPECS5054 / BPECT5054 – Artificial Neural Network
(CSE/CST)

Time: 3 hrs　　　　　　　　　　　　　　　　　　　　　　　Maximum: 70 Marks

Answer ALL Questions
The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions)　　　　　　　**(1 x 10 = 10 Marks)**

Q.1. Answer *ALL* questions　　　　　　　　　　　　　　[CO#]　[PO#]

a. Total number of neuron in human brain is　　　　　　　CO-1　PO-2
　　i. 10^4　　　　　　　　ii. 10^8
　　iii. 10^{11}　　　　　　iv. none

b. The non-linear activation function is　　　　　　　　CO-1　PO-1
　　i. Sigmoidal function　　　ii. Identity function
　　iii. Binary step function　　iv. Both ii and iii

c. The connection area between two biological neuron is called　CO-1　PO-2
　　i. Synapse　　　　　　　ii. Axon
　　iii. Dendrite　　　　　　iv. Soma

d. Which logical operation problem is not linearly separable　CO-2　PO-1
　　i. AND　　　　　　　　ii. OR
　　iii. Ex-OR　　　　　　　iv. NAND

e. The unsupervised learning algorithm is used for　　　　CO-2　PO-2
　　i. Classification problem　ii. Prediction
　　iii. Toy problem　　　　iv. Clustering

f. For the bias value the input is always　　　　　　　CO-2　PO-3
　　i. Zero　　　　　　　　ii. Two
　　iii. Unity　　　　　　　iv. None of the aove

g. The use of RBF function in neural network　　　　　CO-3　PO-3
　　i. Increase the lower dimension of input feature to higher dimension　　ii. decrease the higher dimension of input feature to lower dimension of out put
　　iii. Keeps same dimension　　iv. none

h. Kohonon- SOM is a　　　　　　　　　　　　　　CO-3　PO-2
　　i. Supervised learning　　ii. Unsupervised learnig
　　iii. Reinforcement learning　iv. Semi-supervised learning

i. Which parameter is introduced in ART which distinguishes KSOM　CO-4　PO-2
　　i. Learning parameter　　ii. Vigilance parameter
　　iii. Sigmoidal function　　iv. Bias

j. In Back propagation neural network which learning rule is used for weight update　CO-4　PO-1
　　i. Delta Rule　　　　　　ii. Perceptron learning rule
　　iii. Competitive learning rule　iv. Hebb's learning rule

PART – B: (Short Answer Questions)　　　　　　　**(2 x 10 = 20 Marks)**

Q.2. Answer *ALL* questions　　　　　　　　　　　　　[CO#]　[PO#]

a. Draw a biological neuron cell.　　　　　　　　　　CO-1　PO-2

b. Find out net input of a artificial neural network having three inputs 0.5, 0.6, 0.7 and three weight values 1, -1, 1 and a bias value 0.5.　　CO-1　PO-3

			CO#	PO#
c.	Write Hebb's learning rule.		CO-2	PO-2
d.	Give two applications of supervised learning method.		CO-2	PO-3
e.	Compute Δw by Perceptron learning rule if X1= 1, α = 0.3, target is 0.85 and actual output is 0.8 .		CO-3	PO-2
f.	Draw a 2-2-2 multi- layer neural network.		CO-3	PO-1
g.	What do you mean by linearly non-separable problem?		CO-3	PO-2
h.	What is a Elmann neural network ?		CO-4	PO-4
i.	Draw a recurrent neural nework.		CO-4	PO-1
j.	What are the advantages of ART?		CO-4	PO-2

PART – C: (Long Answer Questions)   (10 x 4 = 40 Marks)

<u>Answer **ALL** questions</u>

		Marks	[CO#]	[PO#]
3. a.	Simulate ANN with BNN. Write mathematical function for ANN	5	CO-1	PO-2
b.	What is activation function? Discuss different types of it.	5	CO-1	PO-1
	(OR)			
c.	Discuss different types of neural network architecture.	5	CO-1	PO-1
d.	What is machine learning ? Compare different machine learning methods.	5	CO-1	PO-2
4. a.	Implement AND function by using Hebb neural network	5	CO-2	PO-3
b.	How Perceptron learning rule is used for training the neural network.	5	CO-2	PO-3
	(OR)			
c.	Using back propagation training find out w5 and w6 after first epoch as per the following neural network.x1=0.01, x2 = 0.02, w1=0.03, w2=0.04, w3=0.05, w4=0.06, b1=0.07, w5=0.08, w6=0.09, w7 = 0.10, w8=0.15, b2=0.20, T1=0.01, T2=0.99, α =0.5.	10	CO-2	PO-2
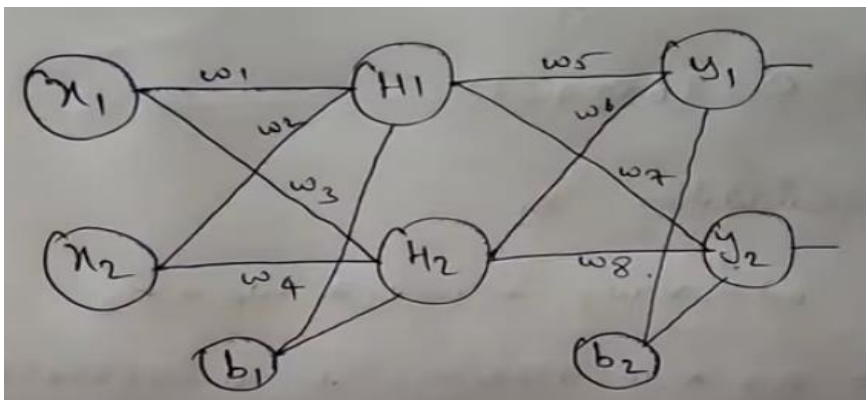
		Marks	[CO#]	[PO#]
5. a.	Implement Ex-OR function using RBF Neural network.	8	CO-2	PO-2
b.	Write properties of RBF.	2	CO-3	PO-1
	(OR)			
c.	How KSOM Neural network is used as unsupervised learning?	5	CO-3	PO-1
d.	Why ART is introduced in neural network?	5	CO-2	PO-2
6. a.	Write the basic working principle of recurrent neural network.	5	CO-2	PO-2
b.	Draw and explain ART-1 neural network		CO-4	PO-1
	(OR)		CO-4	PO-2
c.	Write short notes on: Competitive learning rule	5	CO-4	PO-2
d.	Gradient descent method.	5	CO-2	PO-2

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