Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

B. Tech (Fifth Semester - Regular) Examinations, November – 2024

22BCMPE35011 – ARTIFICIAL NEURAL NETWORK

(CSE - AIML)

Time: 3 hrs Maximum: 70 Marks

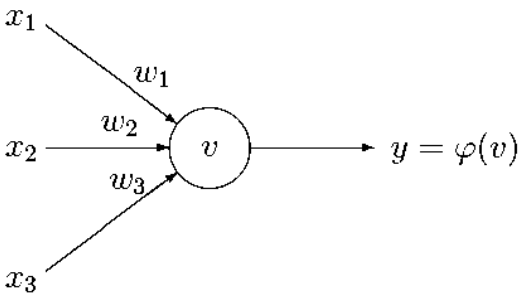
Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

	Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a.	Distinguish between Supervised and Unsupervised Learning.	CO1	K1
b.	Explain the terms: axon, cell body, synapse and dendrite?	CO2	K2
c.	Define Bias and weight.	CO1	K2
d.	What is the difference between Forward propagation and Backward Propagation in Neural Networks?	C03	K3
e.	Discuss the type of Self-organizing Maps	CO4	K2

PART – B **(15 x 4 = 60 Marks)**

	Answer ***All*** the questions	Marks	CO #	Blooms Level
2. a.	Explain the biological prototype of neuron. Also explain the characteristics of neuron.	8	CO1	K1
b.	How the information is processed in the nervous system.	7	CO1	K1
	(OR)			
c.	List and explain the various activation functions used in ANN.	8	CO1	K2
d.	Draw and explain neural network based OR function?	7	CO2	K1
3.a.		8	CO3	K2

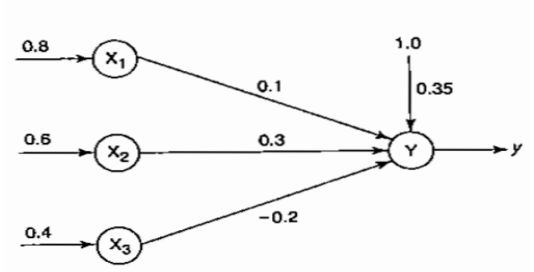
Pattern	P_1	P_2	P_3	P_4
x_1	1	0	1	1
x_2	0	1	0	1
x_3	0	1	1	1

Consider the above Neural network with the weights corresponding to the inputs $w_1 = 2$, $w_2 = -4$, $w_3 = 1$ and activation of the unit is given by the step-function

$$\varphi(v) = \begin{cases} 1 & if\ v \geq 0 \\ 0 & otherwise \end{cases}$$

Calculate what will be the output value y of the unit for each of the input patterns, given above.

b.	Explain the Cerebrum and Cerebellum in detail?	7	CO2	K1
	(OR)			
c.	Calculate the output of the neuron Y for the network shown in the figure using the activation function as (a) binary sigmoid (b) Tanh (c) Identity activation d) ReLU	10	CO3	K3



d.	Write history of artificial neural system development.	5	CO3	K1
4.a.	What is radial basis function in neural network, explain in details?	8	CO3	K2
b.	Explain training algorithm of ART Network.	7	CO3	K1
	(OR)			
c.	Construct a Kohonen self-organizing map to cluster the four given vectors [0 0 1 1], [1 0 0 0], [0 1 1 0] and [0 0 0 1]. The number of clusters to be formed is two. Assume an initial learning rate of 0.5	10	CO4	K2
d.	What is radial basis function in neural network, explain in details?	5	CO3	K2
5.a.	Describe neural gas and growing neural gas	6	CO4	K2
b.	Explain Kohonen's self-organized feature map algorithm and mention its applications.	9	CO4	K2
	(OR)			
c.	Construct an ART1 network for clustering four input vectors with low vigilance parameters of 0.4 into three clusters. The four input vectors are [0001], [0101], [0011] and [1000]. Assume the necessary parameters needed?	15	CO4	K2

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