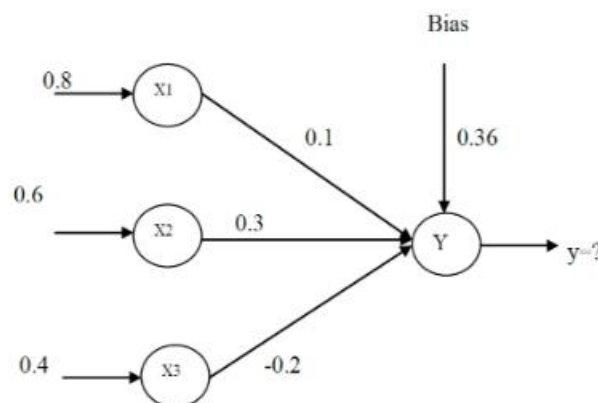


GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER- VI EXAMINATION – SUMMER 2026****Subject Code:3160315****Date:01-06-2026****Subject Name:Introduction to Artificial neural network****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
Q.1	(a) Draw and explain biological neuron structure.	03
	(b) Obtain the output of the neuron Y for the network shown in the figure using the activation function as a binary sigmoidal	04



	(c) Discuss briefly Mc Culloch Pitt's artificial neuron model. Give its limitations.	07
Q.2	(a) List out the potential application of ANN.	03
	(b) Graphically, sketch the different activation functions used in NN.	04
	(c) Briefly explain supervised and unsupervised learning with the help of a diagram.	07
OR		
	(c) State the perceptron learning rule convergence Theorem. Draw and explain the architecture of the perceptron net used for pattern classification.	07
Q.3	(a) List out the limitations of the Perceptron Model.	03
	(b) Briefly explain Kolmogorov Theorem.	04
	(c) Generate AND function with binary inputs and bipolar targets using Adaline net. (weights & Bias & learning rate = 0.25) up to 1 epoch.	07
OR		
Q.3	(a) State the delta learning rule. Why is it called the Least Squares rule?	03
	(b) Briefly explain Hamming distance in detail.	04
	(c) Draw and explain the architecture of the Adaline net.	07
Q.4	(a) State the outer products rule.	03
	(b) Differentiate between continuous BAM and discrete BAM.	04
	(c) Show the step-by-step training algorithm for basic pattern association problem using Hebb rule.	07

OR

- Q.4** (a) Define Bi-directional Associative Memory (BAM). **03**
(b) Explain storage and recall of BAM. **04**
(c) What is an auto-associative net? With an architecture, explain the training algorithm used in auto-associative net. **07**
- Q.5** (a) What is Hopfield Memory? **03**
(b) Mention the merits and demerits of Back propagation Network. **04**
(c) Draw and explain the architecture and algorithm of continuous Hopfield net. **07**

OR

- Q.5** (a) What is the significance of weights used ANN? **03**
(b) How is the energy function defined for a BAM net? **04**
(c) Draw and explain the discrete Hopfield net with its architecture. **07**
