



Roll no.....

End Semester Examination, December 2024
B Tech CSE 7th Semester
Neural Network (ETCS 423A)

Time: 2.5 hrs.

Max Marks: **50**

Note: **All Questions are compulsory.** Marks are indicated against each question.
Usage of scientific calculator is allowed.

PART-A

Q.1 *Attempt any 5 out of 7 questions as stated:*

(a)	Draw a labeled diagram of a basic artificial neuron model and explain each component briefly.	[CO-1] [L-1]
(b)	How does the McCulloch-Pitts model of a neuron differ from the perceptron model?	[CO-2] [L-2]
(c)	List and describe two possible risks in the design and implementation of a neural network for a real-world project.	[CO-4] [L-4]
(d)	What is the role of the activation function in an artificial neural network?	[CO-1] [L-1]
(e)	Explain the difference between supervised and unsupervised learning in neural networks.	[CO-3] [L-3]
(f)	Describe the purpose of competitive learning in neural networks.	[CO-4] [L-2]
(g)	How is the stability of a neural network measured?	[CO-5] [L-3]

2x5

PART-B

Q.2	Explain the architecture and working of a feedforward neural network. Discuss its applications and limitations. OR A student is training a backpropagation neural network. Describe the backpropagation algorithm and explain how tuning parameters like learning rate and the number of hidden nodes affect the network's performance.	CO-2] [L-5] 10
Q.3	Consider a neural network used for pattern recognition tasks. Explain the different types of neural networks commonly used in pattern recognition and discuss their pros and cons. OR How does a feedforward network differ from a feedback network? Provide examples to illustrate these differences and discuss their practical applications.	[CO-3] [L-4] 10

Q.4	a) Describe the different activation functions used in neural networks and explain the significance of choosing a suitable activation function. b) Explain the concept of synaptic dynamics and its impact on the learning capability of a neural network. OR Discuss the stability and convergence of a neural network. How do activation and synaptic dynamics influence these properties?	[CO-4] [L-5] 10
Q.5	Explain the structure and functioning of an ART (Adaptive Resonance Theory) network. How can it be used for pattern clustering? OR Define competitive learning in neural networks and explain how it is applied in feature mapping networks. Include an example of a character recognition task using a competitive learning network.	[CO-3] [L-4] 10