

**IIIrd SEMESTER EXAMINATION, 2023 – 24**  
**IInd yr M.Tech. – Computer Science and Engineering**  
**NEURAL NETWORKS**

Duration: 3:00 hrs

Max Marks: 100

*Note: - Attempt all questions. All Questions carry equal marks. In case of any ambiguity or missing data, the same may be assumed and state the assumption made in the answer.*

Q 1.	Answer any four parts of the following. a) Differentiate Biological Neurons and Artificial Neural Networks. b) Explain single Layer Continuous Perceptron Network. c) Write a short note on Delta Learning Rule. d) What is the basic principle of SVMs? e) Explain Hopfield Network in details. f) Write a short note on Recall Mode for self-organizing Network.	5x4=20
Q 2.	Answer any four parts of the following. a) What is Multi-Layer Feed Forward Networks? b) Explain Error Back propagation training algorithm. c) Explain the concept of application of LMS to noise cancelling in brief. d) How learning process occurs in Hopfield Networks? e) What do you mean by Regularization theory? f) What are the applications of SOM.	5x4=20
Q 3.	Answer any two parts of the following. a) In which manner multilayer Perceptron Models differ from Single Layer Perceptron Model? Explain the reasons for emergence of Multilayer Perceptron Model. b) What is the Least Mean Square Algorithm (LMS Algorithm)? c) Explain the architecture of RBF neural networks. How do RBF neural networks work?	10x2= 20
Q 4.	Answer any two parts of the following. a) What is Associative Memory? Explain its various type in detail with suitable example. b) What is Self-Organizing Network? Explain UN supervised learning of clusters in detail. c) Derive the formula of Gradient descent and the Delta rule.	10x2= 20
Q 5.	Answer any two parts of the following. a) What is Gradient Descent or Steepest Descent? Is it gradient descent with exact line search? b) Design a Bidirectional memory Associative Memory to encode the following pattern.: A <sub>1</sub> =100001                      B <sub>1</sub> =11000 A <sub>2</sub> =011000                      B <sub>2</sub> =10100 A <sub>3</sub> =001011                      B <sub>3</sub> =01110                      Check it for A <sub>3</sub> c) Why SVM is an example of a large margin classifier? Discuss the different kernels functions used in SVM	10x2= 20