Code No: **R164205B** **R16** **Set No. 1**

IV B.Tech II Semester Advanced Supplementary Examinations, Aug/Sep - 2022

ARTIFICIAL NEURAL NETWORKS

(Common to Computer Science and Engineering and Information Technology)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) Artificial neural networks are inspired from biological human brain-Justify. [3]
   b) Write about different types of learning mechanisms. [3]
   c) What is log-likelihood ratio? Give example. [2]
   d) State the universal approximation theorem. [2]
   e) Write the roles of three layers of radial basis function networks. [2]
   f) Write about the applications of support vector learning algorithms. [2]

PART–B *(4x14 = 56 Marks)*

2. a) Give the representation of architectural graph of a neuron. Explain the importance of feedback to design the dynamic system of neural networks. [7]
   b) Explain the role of activation function in neural networks. And describe the three basic types of activation functions. [7]

3. a) Describe the theory of concept of optimization. How it optimizes the learning? Explain in detail. [7]
   b) "The synaptic weight adjustment is proportional to the error signal"-Explain the learning rule adopts this principle. [7]

4. a) Illustrate the weight adjustment operations of perceptron convergence theorem. Present and explain the algorithm steps. [7]
   b) What is Gaussian environment? Explain the relation between perceptron and Bayes classifier for Gaussian environment. [7]

5. a) Step by step explain the back propagation algorithm used to train the multi layer perceptron. [7]
   b) Describe the architectural graph of multilayer perceptron. Explain the three distinct characteristics and various notations used in them. [7]

6. a) How radial basis function networks will be used for function approximation? Explain with pattern classification. [7]
   b) Explain the importance of pattern separability and interpolation in radial basis function networks. How Cover's theorem helps in it? Discuss. [7]

7. a) What is SVM? How to design a SVM? Explain briefly? [7]
   b) How to determine optimal hyper plane for nonseparable patterns? Briefly Explain? [7]