

IV B.Tech. I Semester Regular Examinations, November -2005
ARTIFICIAL NEURAL NETWORKS
(Common to Electronics & Communication Engineering, Electronics & Instrumentation Engineering, Bio-Medical Engineering and Electronics & Telematics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Explain the following learning rules in detail:
 - (a) Error correction learning
 - (b) Bollzmann learning
 - (c) **Hebbian** learning [6+5+5]
2. Explain about different Neuron models, their architectures and learning types.[16]
3. Explain Network Pruning Techniques in detail. [16]
4. (a) Explain how Back Propagation Network is used as differentiator.
(b) Explain about cross validation technique. [8+8]
5. (a) Explain different methods of estimating Regularization parameter.
(b) Compare RBF and multilayer perceptron networks. [8+8]
6. (a) Explain with architecture the son algorithm.
(b) Write about contextual maps. [8+8]
7. Write about different types of Associative memories. [16]
8. Write short notes on:
 - (a) LVQ
 - (b) Hessian matrix
 - (c) Application of Neural Network for optimisation. [5+5+6]

IV B.Tech. I Semester Regular Examinations, November -2005
ARTIFICIAL NEURAL NETWORKS
(Common to Electronics & Communication Engineering, Electronics &
Instrumentation Engineering, Bio-Medical Engineering and Electronics &
Telematics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Give the different architectures of Neural Networks.
(b) Write about the following Learning rules:
 - i. Simple Competitive Learning
 - ii. Bollzmann learning[8+4+4]
2. State and prove Perceptron Convergence Theorem. [16]
3. (a) Explain with block diagram the Adaptive Filtering problem.
(b) Derive the equation for weight change using LMS algorithm. [8+8]
4. (a) Give the relation between perceptron and Bayes classifier for Gaussian distribution and derive it.
(b) Explain how XOR problem is solved using Back propagation algorithm. [8+8]
5. Explain different Network Pruning Techniques. [16]
6. (a) Compare RBF Network with multilayer perceptron.
(b) Explain how to choose a good choice for the regularization parameter ' λ ' in the regularization theory. [8+8]
7. (a) Explain with block diagram Learning vector Quantization technique.
(b) Give the energy analysis of discrete Hopfield Network. [8+8]
8. Write short notes on:
 - (a) Contextual maps
 - (b) Application of ANN in solving TSP problem [8+8]

IV B.Tech. I Semester Regular Examinations, November -2005
ARTIFICIAL NEURAL NETWORKS
(Common to Electronics & Communication Engineering, Electronics &
Instrumentation Engineering, Bio-Medical Engineering and Electronics &
Telematics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Compare AI and Neural Nets.
(b) Explain statistical Learning theory in detail. [8+8]
2. (a) Derive the equation for weight change in LMS algorithm.
(b) Explain different annealing techniques and their importance. [8+8]
3. State and prove perceptron convergence theorem. [16]
4. Give the architecture and algorithm of Back propagation network and derive the weight change formula in each layer. [16]
5. Write about Regularization Theory of Networks and how it is applied to RBF Networks. [16]
6. Explain the properties of feature Map. [16]
7. (a) Give the energy analysis of Hopfield Network.
(b) Give the architecture and algorithm of Bidirectional Associative memory. [8+8]
8. Explain how ANN is applied for
(a) Pattern classification
(b) Image processing [8+8]

IV B.Tech. I Semester Regular Examinations, November -2005
ARTIFICIAL NEURAL NETWORKS
(Common to Electronics & Communication Engineering, Electronics &
Instrumentation Engineering, Bio-Medical Engineering and Electronics &
Telematics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain memory based Learning and Hebbian Learning in detail.
(b) With neat block diagram explain supervised and unsupervised Learning techniques. [8+8]
2. (a) Derive the equation for weight change for Winer Filter using Least-squares Filter.
(b) Explain Bayes classifier for Gaussian distribution. [8+8]
3. (a) Derive the equation for weight change in the input layer and hidden layer for Back Propagation Network.
(b) Explain how EX-OR problem is solved using Back Propagation Network. [8+8]
4. Explain what is Gauss-validation and variants of it. [16]
5. (a) Explain Cover's theorem on separability of patterns.
(b) Give the approximation properities of RBF Networks. [8+8]
6. (a) Explain what is Kernel Regression and its relation to RBF Networks.
(b) Explain the properities of Feature Map. [8+8]
7. (a) Explain Contextual Maps.
(b) Explain energy Analysis of Hopfield Networks. [8+8]
8. Write short notes on Applications in speech and Image Processing. [16]
