Code No: RR410212 **Set No.1**

IV B.Tech. I Semester Regular Examinations, November -2005
NEURAL NETWORKS AND APPLICATIONS
(Electrical & Electronic Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) With the help of a neat diagram explain the analogy of a logical neuron.
   (b) Explain what is an artificial neural network and show how a basic ANN is constructed using a biological neuron. [8+8]
2. Explain in detail the differences between competitive learning and differential competitive learning. [16]
3. (a) Explain the significance of perceptron convergence theorem.
   (b) Write short notes on Discriminate function. [10+6]
4. Draw the architecture of Feed Forward type and Recurrent type neural network and explain their difference. [16]
5. What are the properties of the continuous time dynamical system model? Explain them using a single layer neural network. [16]
6. Mention some of the feature mapping capabilities of neural networks and explain any two of them in detail. [16]
7. Derive the back propagation learning rule for the first hidden layer in a three layer (2 hidden layer) feed forward network. Assume that the first hidden layer has k units with weights w_{ki} and differential activations f_{h1}(net k) , the second layer has j units with weights w_{jk} and differential activations f_{h2}(net1) and the output layer has L units with weights w_{lj} and differential activation f_0(net l). [16]
8. Explain how neurocomputing circuits can be modeled using digital and analog circuits. [16]

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Code No: RR410212 **Set No.2**

IV B.Tech. I Semester Regular Examinations, November -2005
NEURAL NETWORKS AND APPLICATIONS
(Electrical & Electronic Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the significance of Acting potential and resting potential in the neural cells.
   (b) Explain briefly how information in processed in neural networks. [8+8]
2. Write notes on:
   (a) Error correction learning.
   (b) Reinforcement learning. [8+8]
3. With an example explain how a pattern can be trained and classified using discrete perceptron algorithm. [16]
4. Derive the learning rule for Back Propagation network. What are the major drawbacks? Suggest solutions, to over come these drawbacks. [16]
5. Discuss about the stability property of the dynamical system taking an example. [16]
6. What is minimum spanning tree? Write the algorithm of Self organizing feature map? [16]
7. Design a multilayered neural network to find the weight- matrix to store the following binary input and output pattern pairs x(1)=(1 0 1), y(1)=(1 0); x(2)=(0 1 0), y(2)=(0 1). Use the binary step function with threshold 0, as activation function for both layers, test the response of the network in both directions on each of the binary training pattern. [16]
8. Explain template matching networks in neural processing. Draw a template bit map and the corresponding circuit diagram. [16]

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Code No: RR410212 **Set No.3**

IV B.Tech. I Semester Regular Examinations, November -2005
NEURAL NETWORKS AND APPLICATIONS
(Electrical & Electronic Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) If the activation function of all hidden units is linear, show that a multi layer perceptron can be replaced by a single layer perceptron.
   (b) In which neurons sigmoidal functions are used. Justify your statement. [8+8]
2. Explain in detail the concepts of transient state, steady state, equilibrium state and stable state. [16]
3. Explain the step by step procedure involved in classification and training of patterns using
   (a) Continuous perceptron algorithm.
   (b) Multicategory single layer perceptron. [16]
4. Discuss about combined back propagation and cauchy training and differentiate associative and auto associative memory. [16]
5. Explain about the recursive asynchronous update of corrupted digit 4. [16]
6. Draw the flowchart of ART1 encoding algorithm for unipolar binary inputs. [16]
7. Explain how multilayer feed forward neural network can be used for character recognition. Use a sample of 7×10 pixel matrix for the recognition of letter A. [16]
8. What are the various active building blocks of neural networks? Explain the current mirror and inverter based neuron in detail. [16]

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Code No: RR410212 **Set No.4**

IV B.Tech. I Semester Regular Examinations, November -2005
NEURAL NETWORKS AND APPLICATIONS
(Electrical & Electronic Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Differentiate hetero-associative memory and auto-associative memory.
   (b) Clearly explain, for what types of applications neural networks will be best suited than expert system. [8+8]
2. (a) Explain in detail "Recall in Neural Networks".
   (b) Explain autonomous and non-autonomous dynamical systems. [8+8]
3. What are the basic nondynamic learning control architectures? Explain each of them. [16]
4. Explain how generalized Delta learning rule can be applied to Feed Forward Neural networks. [16]
5. Illustrate how energy gradient descent in v^2 space takes place? [16]
6. Consider a ART1 network with four category neurons indicating the potential for four clusters and a 25 - dimensional input vector with entries 0,1. Illustrate the different stages of discrete time learning. [16]
7. Describe the process of modelling a linear programming problem using a gradient type of neural network. [16]
8. What do you understand by finite resolution and conversion error? Explain the circuit producing a single digitally programmable weight employing a multiplying D/A converters (MDAC). [16]

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