Code No: NR420206 **Set No.1**

IV B.Tech. II Semester Supplementary Examinations, July -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) How do you justify that brain is a parallel distributed processing system?
   (b) Explain the structure of a brain.
2. Explain in detail the concepts of transient state, steady state, equilibrium state and stable state.
3. State and prove perceptron convergence theorem.
4. Explain, why it is preferable to have different values of h for weights leading to the units in different layers in a feed forward neural network.
5. Design a Hopfield network to solve a five city traveling salesperson problem
6. State an application problem of Kohonen network and explain it in detail.
7. Draw the architecture of a multilayered feed forward network for handwritten character recognition. How many hidden layers are required? Describe the feature of each hidden layer?
8. What are the various active building blocks of neural networks? Explain the current mirror and inverter based neuron in detail.

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Code No: NR420206 **Set No.2**

IV B.Tech. II Semester Supplementary Examinations, July -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. Discuss the classification of neural nets based on training, architecture and activation functions used.
2. (a) Distinguish between local minima and global minima in neural networks and what are the effects of these on neural networks.
   (b) Explain the distinction between stability and convergence.
3. Discuss in detail about non-parametric training concept.
4. Design and train a feed forward networks for the problems.
   (a) Consider a 4 input and 1 output problem where the Output required to be 'one', if the input configuration is symmetrical and 'zero' otherwise.
   (b) Why back propagation is also called as generalized delta rule.
5. What is energy function? How it is used to find the convergence of the given function.
6. Write short notes on Grossberg layer and its training. Explain with an example.
7. Describe the process of modelling a linear programming problem using a gradient type of neural network.
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).

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Code No: NR420206 **Set No.3**

IV B.Tech. II Semester Supplementary Examinations, July -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) Distinguish learning equation and learning law.
   (b) Briefly explain the purpose of logistic function.
2. (a) Explain in detail "Recall in Neural Networks"
   (b) Explain autonomous and non-autonomous dynamical systems.
3. (a) Explain with Block diagram of recognition and classification system.
   (b) What is perceptron learning for perceptron classification.
4. Distinguish between multilayer perceptron and a general multilayer feedforward neural network.
5. (a) Construct a Hopfield network to associate 3x3 input images with dots and dashes.
   (b) How many spurious attractors does this network have i.e how many patterns other than dots and dashes are stable attractors?
   (c) How many input errors can this network withstand i.e how much can the image of a dot (or dash) be corrupted while still allowing the network to retrieve a dot (or dash)?
6. Write the Algorithm for ARTI Network.
7. Explain how multilayer feed forward neural network can be used for character recognition. Use a sample of 7x10 pixel matrix for the recognition of letter A.
8. Explain template matching networks in neural processing. Draw a template bit map and the corresponding circuit diagram.

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Code No: NR420206 **Set No.4**

IV B.Tech. II Semester Supplementary Examinations, July -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) In the sigmoidal function $s(x) = 1/(1 + e^{-cx})$ explain the role of the constant C, and draw (the role of constant C) for various values of C. Also draw the sigmoidal function.
   (b) Determine the final weights for logic function of AND and OR using perceptron learning rule.
2. Explain in detail the differences between competitive learning and differential competitive learning.
3. Discuss in detail about minimum distance classification system for a linear discriminant function.
4. Explain how a multilayer feedforward neural network with linear units in all the layers is equivalent to a linear associate network.
5. In character recognition problems, we can work with small images or large images that have the same features. How large a Hopfield network would be needed to store images corresponding to the characters $\{H, O, P, F, I, E, L, D\}$. What is the expected performance of the network, with respect to the presence of spurious attractors and the amount of noise (corruption) in the input images that can be tolerated?
6. What is Adaptive Resonance Theory? Explain how this theory is used to explain cluster Discover Network?
7. Derive the generalized feed forward algorithm for a multilayered network having 2 layers of hidden units. Explain the process of feed forward, back propagation of error, and updation of weights and biases.
8. Explain how neurocomputing circuits can be modeled using digital and analog circuits.

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