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Exam.Code:1018
Sub. Code: 7786

1108
M.E. Electrical Engineering (Power Systems)
Second Semester
EE-8203: Advanced Neural Networks and Fuzzy Logic

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt any five questions. Assume and specify any missing data.

x-x-x

I (a) Compare artificial neuron with biological neuron. Describe the various characteristics of ANN not present in modern computers. (5)

(b) Discuss different types of neural networks and describe their suitability for different applications. (5)

II (a) Find the new weights, using backpropagation algorithm for the network shown in Fig1. (10)
The network is presented with input pattern [-1, 1] and the target output is +1. Use a learning rate of 0.25 and bipolar sigmoidal activation function.

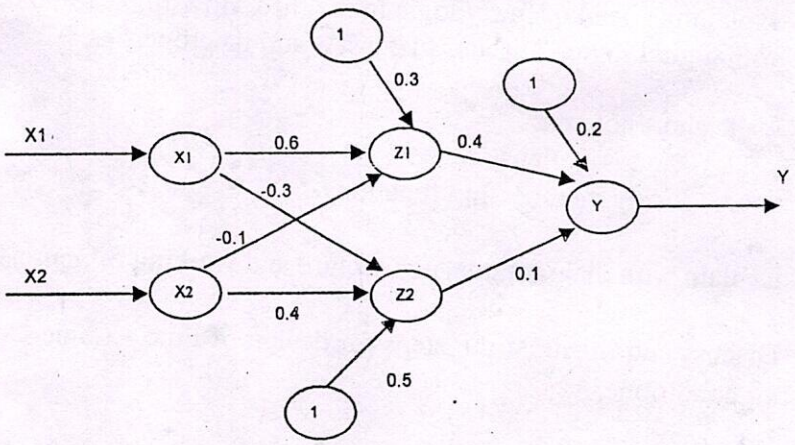

Fig.1

III (a) Explain the application of neural networks for load forecasting in power systems specifying the different steps required, with illustrations. (5)

(b) How Hopfield network works? Illustrate an application of Hopfield network with suitable diagram. (5)

IV (a) Explain the architecture and training algorithm of RBF network. (5)

P.T.O.

(b) Given the following data: (5)

Original Vector	Associated Vector
A1(1,0,0)	B1(0,0,1)
A2(0,1,0)	B2(0,1,0)
A3(0,0,1)	B3(1,0,0)

Prove that applying an input vector to A through W produces its associated output vector at B and this in turn when applied to W^T again produces A.

V (a) What is self organizing mapping? Explain the essential processes involved in the formation of SOM. (5)

(b) What is unsupervised learning? How is competition performed for clustering of the vectors? (5)

VI (a) Describe the architecture of ART network. Consider an ART network with four input units and three cluster units. Determine the updation in weights when vector [1 0 10] is applied. Assume ρ= 0.3. Assume necessary parameters needed. (5)

(b) What do you mean by defuzzification? Explain three most popularly used defuzzification methods. (5)

VII (a) Explain the need of fuzzy logic in real life. How fuzzy logic is different from digital logic. Discuss fuzzy sets and its properties. (5)

(b) Write short note on: (5)
1. Modus Tollens
2. Fuzzy membership functions

VIII(a) Explain with diagram, the architecture and working of neuro-fuzzy system. (5)

(b) Discuss and illustrate the steps for design of Fuzzy Logic Controller for an air conditioner. (5)

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