B.E. DEGREE END SEMESTER EXAMINATIONS, NOV/DEC 2011
COLLEGE OF ENGINEERING, GUINDY.
ELECTRICAL AND ELECTRONICS ENGINEERING BRANCH
VIII SEMESTER

EE 519- NEURAL NETWORK AND FUZZY LOGIC CONTROL

Time : 3 hr Max . Mark: 100

Answer All Questions

Part – A (10 x 2 = 20 Marks)

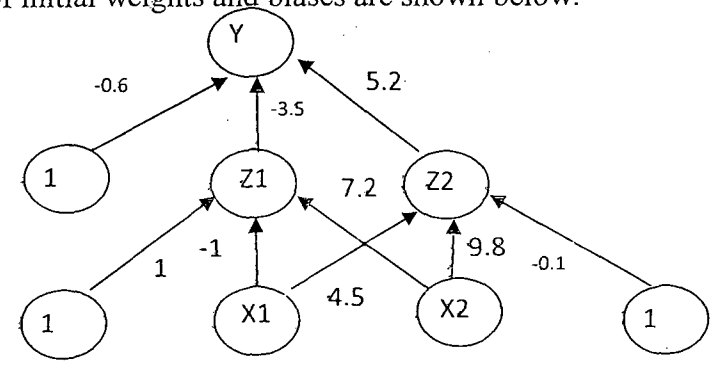
1. Define activation functions.
2. Compare weights and bias.
3. List the applications of neural network.
4. Discuss in detail the energy functions used in the discrete hopfield net.
5. State the properties of classical sets.
6. Consider the following fuzzy sets $A = \left\{\frac{0.8}{10} + \frac{0.3}{15} + \frac{0.6}{20} + \frac{0.2}{25}\right\}$

$$B = \left\{\frac{0.4}{10} + \frac{0.2}{15} + \frac{0.9}{20} + \frac{0.1}{25}\right\} \quad Find\ A \cup B\ and\ A \cap B$$

7. Define fuzzy cartesian product
8. Write four advantages of GA.
9. Name the different types of Defuzzification techniques.
10. State core, support and boundary in membership function.

Part B (5*16=80 Marks)

11. Generate a neural net using BPN algorithm for XOR logic functions. The architecture and the values of initial weights and biases are shown below. (16)



12. a) To find the stopping condition, the following calculation can be used, for energy determination $E = -0.5X_i W^T X_i^T$ the following inputs are to be stored $X_1 = [1\ 1\ 1\ 1\ 1]$, $X_2 = [1\ -1\ -1\ 1\ -1]$, $X_3 = [-1\ 1\ -1\ -1\ -1]$ calculate the weight matrix, the energy of the stored patterns and the energy if the test paeeterns are given as $X_1^1 = [1\ 1\ 1\ -1\ 1], X_2^1 = [1\ -1\ -1\ -1\ -1], X_3^1 = [1\ 1\ -1\ -1\ -1]$ compare the test patterns energy with stored pattern energy. Comment on the network performance. (16)

(OR)

b) Explain Discrete Hop field network Architecture and Application algorithm.

13. . (a) Draw a flow chart for a simple Genetic Algorithm and explain. (8)

Explain any 3 selection process with an example. (8)

(OR)

(b) (i) State the algorithm of Hebb net with its architecture. (8)

(ii) Draw the architecture of Adaline net and explain the algorithm (8)

14. With a neat block diagram explain the various blocks in FLC. (16)

(OR)

Discuss in detail about various Defuzzification methods. (16)

15. a. I = { 0.7, 0.2, 1, 0.5, 0.2}

V = { 0.5, 0.7, 1, 0.1, 0.9}

C = {0.7, 1, 0.3}

Find P , using Fuzzy Cartesian Product P = V * I and T = I*C. Using Max-Min and Max-product composition find E = P*T. (16)

(OR)

b. Use Cosine amplitude method and Max-min method to find the tolerance relation.

$$\begin{bmatrix} 0.2 & 0.1 & 0.1 & 0.2 & 0.4 \\ 0.4 & 0.5 & 0.6 & 0.6 & 0.6 \\ 0.4 & 0.4 & 0.3 & 0.2 & 0 \end{bmatrix}$$ (16)

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