**Reg. No. \_\_\_\_\_\_\_\_**

**Karunya University**

**(Karunya Institute of Technology and Sciences)**

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination - June 2011**

**Subject Title: NEURAL NETWORKS AND FUZZY SYSTEMS Time: 3 hours**

**Subject Code: 09EC213 Maximum Marks: 100**

#### **Answer ALL questions**

**PART – A (10 x 1 = 10 MARKS)**

1. What is momentum?

2. Mention the most commonly used two types of non linear activation functions.

3. Define Lyapunov energy function.

4. Define Hebb rule

5. What is winner Take All?

6. Define stability plasticity dilemma.

7. Define support of membership function.

8. What is fuzzy equivalence relation?

9. Mention any two structure of fuzzy rule system.

10. What are the two issues in cluster analysis?

**PART – B (5 x 3 = 15 MARKS)**

11. Differentiate between supervised learning and unsupervised learning.

12. Describe the architecture and training algorithm of ADALINE networks.

13. Explain the algorithm steps used in Mexican Hat network.

14. A and B are fuzzy sets.

A =  B = 

Find the a. union b. difference c. 

15. Explain the design steps used in modeling a controller for control systems.

**PART – C (5 x 15 = 75 MARKS)**

16. Explain in detail about the organization, functions, characteristics and operations of biological neural networks.

(OR)

17. Draw the architecture of a back propagation neural network and explain in detail about its training algorithm.

18. a. Give the structure of a bidirectional associative memory and explain the training algorithm used for discrete BAM. (10)

b. Give the perception model to solve two input Exclusive OR problem and explain its application. (5)

(OR)

19. Describe the architecture and application of MADALINE Networks.

20. a. Explain the Kohonen self organizing maps architecture with learning algorithm. (10)

b. Explain the Hamming net with example. (5)

(OR)

21. Explain the architecture, training algorithm of ART with neat diagram.

[P.T.O]

22. What is meant by defuzzication? What are the various methods for defuzzifing fuzzy output functions? Explain the defuzzication methods in detail.

(OR)

23. a. Explain about the generation of membership function using neural networks. (9)

b. State and prove excluded middle laws for fuzzy sets. (6)

24. a. Explain the Fuzzy C means algorithm in detail. (11)

b. Fuzzy equivalence relation R = 

Find the 6 cuts at values 0.9, 0.8, 0.5 (4)

(OR)

25. Write briefly about multifeature pattern recognition with examples.

