Code No: 118DJ JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD B. Tech IV Year II Semester Examinations, May - 2017 NEURAL NETWORKS AND FUZZY LOGIC (Electrical and Electronics Engineering)

## Time: 3 hours

Max. Marks: 75

(25 Marks)

**R13** 

**Note:** This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

## PART - A

	=	o mains)
1.a)	Compare Supervised learning with Unsupervised learning.	[2]
b)	Give some of the applications of ANN.	[3]
c)	Draw a perceptron model.	[2]
d)	Classify different types of neurons.	[3]
e)	What is Associative Memory?	[2]
f)	Define the term "learning". What is Hebbian Learning?	[3]
g)	Explain the stability analysis interms of Hopfield network.	[2]
h)	Elaborate "BAM Energy Function".	[3]
i)	Name some of the properties of fuzzy sets.	[2]
j)	What is the role of membership function? Draw some membership functions.	[3]
	PART - B	
	(5	0 Marks)
2.a)	With the help of a neat diagram, explain the analogy of a biological neuron.	
b)	Explain (i) Integrate and Fire Neuron Model (ii) Spiking Neuron Model. OR	[5+5]
3.a)	What are the basic learning laws?	
b)	Explain the weight updation rules in each learning law.	[5+5]
4.a)	Explain the back propagation training algorithm.	
b)	Discuss in detail the steps followed and the terminology used.	[5+5]
5 a)	Design and train a feed forward network for the problem.	
0.u)	Consider a 4 input and 1 output problem where the output required to be 'or	ne', if the
1 \	input configuration is symmetrical and 'zero' otherwise.	F = . = 1
b)	Why back propagation is also called as generalized delta rule?	[5+5]
6.	Explain in detail pattern mathematics with examples.	[10]
_	OR	
7.	<ul><li>Write short notes on:</li><li>a) Matrix Memories</li><li>b) Context addressable memory.</li></ul>	[5+5]

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- 8.a) What is Bidirectional Associative Memory? Give its structure and also its algorithm.
- b) Explain the Hopfield model and apply it to traveling salesman problem. [5+5] OR
- 9.a) With a neat sketch, explain the function of ART-1 network and explain its operation with relevant equations.
  - b) State and prove LVQ Convergence Theorem with a neat flowchart. [5+5]
- 10. Compare fuzzification with defuzzification. Explain different types of Defuzzification methods. [10]

OR

11. Draw a block diagram of a possible fuzzy logic control system. Explain briefly about each block. [10]

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