Course Code: 18EE0231 **R18**

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
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QUESTION BANK (DESCRIPTIVE)

Subject with Code: Neural Networks and Fuzzy Logic (18EE0231) **Course & Branch**: B.Tech - EEE

Regulation: R18 **Year & Sem:** IV-B.Tech & I-Sem

UNIT –I
FUNDAMENTALS OF ARTIFICIAL NEURAL NETWORKS

1	a	Mention the basic parts of Biological neuron	[L1][CO1]	[2M]
	b	List out the different activation functions used in artificial neuron model	[L1][CO1]	[2M]
	c	List out the learning mechanisms used in Artificial Neural Networks	[L1][CO1]	[2M]
	d	Define linearly separable problem in ANN	[L1][CO1]	[2M]
	e	Give one example of linearly inseparable problem	[L1][CO1]	[2M]
2	a	Explain organization of human brain.	[L1] [CO1]	[5M]
	b	Discuss the functioning of biological neuron.	[L2] [CO1]	[5M]
3	a	How artificial neuron is inspired from the biological neuron? Explain.	[L2] [CO1]	[5M]
	b	Explain the basic architecture of McCulloch – Pitts neuron model and also realize 3-input NAND gate using McCulloch – Pitts model.	[L3] [CO1]	[5M]
4	a	List out the different activation functions used in neural networks.	[L1] [CO1]	[5M]
	b	Why thresholding function is not used as activation function in Multi-Layer Feed Forward Networks.	[L3] [CO1]	[5M]
5		Discuss the applications of ANN.	[L2] [CO1]	[10M]
6	a	Explain characteristics of Artificial neural network.	[L1] [CO1]	[5M]
	b	What is generalization? Explain.	[L2] [CO1]	[5M]
7		Explain types of activation function & Explain Neural dynamics.	[L2] [CO1]	[10M]
8		Explain the functioning of Rosenblatt perceptron.	[L2] [CO1]	[10M]
9	a	Implement a perceptron to solve simple AND problem with two inputs.	[L3] [CO1]	[5M]
	b	Try to implement XOR problem with two inputs and discuss on it.	[L4] [CO1]	[5M]
10		Discuss different learning mechanisms used in artificial neural networks	[L2] [CO1]	[10M]

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UNIT –II

SUPERVISED, UNSUPERVISED NETWORKS

1	a	Generally which activation function is used in input layer of the ANN	[L1][CO2]	[2M]
	b	Define learning rate	[L1][CO2]	[2M]
	c	Define momentum coefficient in back propagation learning	[L1][CO2]	[2M]
	d	How can you decide number of hidden layer neurons in ANN	[L1][CO2]	[2M]
	e	Why perceptron could not solve XOR problem	[L1][CO2]	[2M]
2		Explain supervised learning in detail with block diagram .	[L2] [CO2]	[10M]
3		Give the perceptron weight updating rule and the learning algorithm	[L3] [CO2]	[10M]
4	a	Explain why single layer perceptron network couldn't solve even EX-OR problem.	[L3] [CO2]	[5M]
	b	Derive the equation for weight change for discrete perceptron network.	[L3] [CO2]	[5M]
5		Explain input layer, hidden layer &output layer computations in multi layer feed forward networks.	[L2] [CO2]	[10M]
6		Discuss credit assignment problem in Multi Layer Feed forward networks.	[L5] [CO2]	[10M]
7	a	Explain how supervised learning happens in neural networks.	[L2] [CO2]	[5M]
	b	Explain back propagation learning.	[L3] [CO2]	[5M]
8	a	What are the different learning parameters in back propagation?	[L1] [CO2]	[5M]
	b	Explain how they influence the learning.	[L2] [CO2]	[5M]
9	a	How the hidden layer neurons influence representation of neural network?	[L3][CO2]	[5M]
	b	Explain how to choose number of hidden layer neurons.	[L3] [CO2]	[5M]
10		Explain ANN approach to load forecasting problem.	[L5] [CO3]	[10M]

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UNIT –III
ASSOCIATIVE MEMORIE

1	a	Define associative memory	[L1][CO2]	[2M]
	b	List out different types of associative memories	[L1][CO2]	[2M]
	c	What is the difference between auto associative memory and hetero associative memory	[L1][CO2]	[2M]
	d	Define Energy function in Auto associative memory	[L1][CO2]	[2M]
	e	Give Energy function in BAM	[L1][CO2]	[2M]
2		What is associative memory? Explain briefly	[L2] [CO2]	[10M]
3		Briefly explain the working principle of hetero correlators.	[L2][CO2]	[10M]
4		Explain storage and recall phase in Auto associative memory.	[L2][CO2]	[10M]
5		Explain the working principle of BAM.	[L2][CO2]	[10M]
6		Distinguish Auto associative & Hetero associative memories.	[L2][CO2]	[10M]
7	a	What is hamming distance?	[L2][CO2]	[5M]
	b	Explain how Associative memories work based on hamming distance.	[L3][CO2]	[5M]
8	a	Explain in detail recurrent associative memory.	[L3][CO2]	[5M]
	b	Construct a BAM with 4 nodes in the first layer and 2 nodes in the second layer and symmetric weights. Establish the following three associations (+1, +1, -1, -1) -> (+1, +1) (+1, +1, +1, +1) -> (+1, -1) (-1, -1, +1, +1) -> (-1, +1)	[L3][CO2]	[5M]
9		Explain how noisy patterns are recognized in auto associative memory with an example.	[L4][CO2]	[10M]
10		Explain how pattern pair is recalled in BAM with an example.	[L2][CO2]	[10M]

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UNIT –IV
CLASSICAL AND FUZZY SETS

1	a	Define fuzzy set	[L1][CO4]	[2M]
	b	Give different ways of assigning membership function	[L1][CO4]	[2M]
	c	In the case of continuous variable how the membership is given?	[L1][CO4]	[2M]
	d	Explain fuzzy intersection operation	[L1][CO4]	[2M]
	e	Which properties are not valid in fuzzy set theory	[L1][CO4]	[2M]
2		Compare and contrast Fuzzy vs Crisp	[L2][CO4]	[10M]
3	a	Explain Operations performed on crisp sets.	[L1][CO4]	[5M]
	b	Give the properties of crisp sets.	[L1][CO4]	[5M]
4	a	Explain operations performed on fuzzy sets.	[L2][CO4]	[5M]
	b	Give the properties of fuzzy sets.	[L1][CO4]	[5M]
5	a	Explain Cartesian product on fuzzy sets.	[L2][CO4]	[5M]
	b	Discuss how fuzzy relations are formed based on Cartesian product.	[L2][CO4]	[5M]
6	a	Consider set X = {2, 4, 6, 8, 10} then find its power set, cardinality and cardinality of power set	[L3][CO4]	[5M]
	b	Explain the operations and properties over a fuzzy relation.	[L2][CO4]	[5M]
7		Consider two fuzzy subsets of the set X, X = {a, b, c, d, e} referred to as A and B. A = {1/a, 0.3/b, 0.2/c 0.8/d, 0/e) and B = {0.6/a, 0.9/b, 0.1/c, 0.3/d, 0.2/e} Find:. (i) Complement. (ii) Union. (iii) Intersection iv) Difference	[L3][CO4]	[10M]
8	a	Define membership function.	[L2][CO4]	[3M]
	b	Give various ways of allotting membership functions for fuzzy sets.	[L2][CO4]	[7M]
9		Explain Composition operation performed on fuzzy relation with example.	[L2][CO4]	[10M]
10	a	What is fuzzy logic?	[L3][CO4]	[5M]
	b	What are the sources fuzzy information? and explain each.	[L2][CO4]	[5M]

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UNIT –V
FUZZY LOGIC SYSTEMS

1	a	Give three defuzzyfication methods	[L1][CO5]	[2M]
	b	What are the basic building blocks in fuzzy logic ?	[L1][CO5]	[2M]
	c	What are the advantages of fuzzy logic control?	[L1][CO5]	[2M]
	d	Draw the block diagram of fuzzy logic control	[L1][CO5]	[2M]
	e	Briefly explain fuzzy logic control mechanism	[L1][CO5]	[2M]
2		Explain fuzzy inference using Modus ponens and Modus tollens.	[L2][CO5]	[10M]
3		Explain the process of fuzzification in fuzzy logic.	[L3][CO5]	[10M]
4		Explain fuzzy rule based system in fuzzy logic.	[L3][CO5]	[10M]
5		Explain importance of defuzzification in fuzzy logic.	[L3][CO5]	[10M]
6	a	List out different defuzzication methods available.	[L1][CO5]	[5M]
	b	Explain any one of the defuzzification method.	[L2][CO5]	[5M]
7		Explain Centre of gravity defuzzification method with an example.	[L2][CO5]	[10M]
8		Explain Centre of Sums defuzzification method with an example.	[L2][CO5]	[10M]
9		Discuss any one fuzzy logic application in electrical engineering.	[L5][CO6]	[10M]
10		Explain working of Greg Viot's Fuzzy Cruise controller.	[L5][CO6]	[10M]

Prepared by: N. Ramesh Raju