

Time: 3 hours

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IV B.Tech II Semester Regular/Supplementary Examinations, April/May - 2016 AI TECHNIQUES

(Electrical and Electronics Engineering)

Max. Marks: 75

Answer any FIVE Questions All Questions carry equal marks

1 Discuss learning strategies like: i) Rote learning ii) learning by instruction iii) learning by deduction. iv) Concept learning. [15] Discuss the McCulloch-Pitts model of an artificial neuron. [8] 2 a) b) What are the basic learning mechanisms of neural networks? Discuss any one of the method. [7] 3 a) Give the architecture of RBF network and explain in detail. [8] b) Write approximation properties of radial basis function network. [7] 4 a) Classify the optimization techniques with respect to their implicit operation. [8] b) Explain the role of Fitness Function in generating the population. [7] 5 a) Explain convergence of genetic algorithm with the help of GA cycle. [8] b) Explain the following with respect to genetic Operators: i) inversion ii) deletion [7] 6 a) Explain fuzzy versus crisp set operations with an example. [8] b) Define the following with example i) Membership iv) cardinality ii) power set iii) super set [7] 7 a) Explain the following i) centroid method ii) centre of sums iii) Knowledge base iv) Fuzzification [8] b) Discuss in detail about the development of rule base and decision making system with the help of fuzzy logic system. [7] 8 Explain the design of Fuzzy PI controller for speed control of DC motors. [15]

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		ماه ماه ماه ماه ماه	
1	a)	How do you classify the methods of AI techniques? Explain any one method with neat schematic.	[8]
	b)	Discuss the role of learning in problem solving.	[7]
2	a)	What do you mean by topology of artificial neural networks? Give a few basic topological structures of artificial neural networks.	[8]
	b)	Write and explain perceptron convergence theorem.	[7]
3	a)	How to achieve the performance of Back Propagation Learning? Discuss in detail.	[8]
	b)	What are the limitations of Back Propagation algorithm?	[7]
4		Explain below specified encoding technique: i) Octet encoding ii) hexadecimal encoding.	
		iii) value encoding iv) tree encoding	[15]
5	a)	Explain generation cycle of simple genetic algorithm in step wise.	[8]
	b)	Binary coding and bitwise operators used in Genetic Algorithms.	[7]
6	a)	Discuss various types of membership functions. Which membership function do you prefer for optimization?	[8]
	b)	Discuss basic fuzzy set operators with examples.	[7]
7	a)	What is approximate reasoning? State and explain important fuzzy inferring procedures.	[8]
	b)	Explain about the defuzzification to crisp sets with an example.	[7]
8		Explain how can you apply genetic algorithm for economic load control dispatch	[15]

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1	a)	What is an AI technique? Discuss any one AI problem which can be solved by using AI techniques.	[8]
	b)	Discuss the issues in knowledge representation.	[7]
2	a)	What are the main differences among the three models of perceptron, namely, discrete, continuous and multi-category?	[9]
	b)	Write the limitations of the perceptron models.	[6]
3	a)	Explain in detail "Error back propagation training algorithm".	[8]
	b)	Give architectural description for Hopfield network.	[7]
4	a)	Define GA search space? Explain the most important aspects of using genetic algorithm.	[8]
	b)	Write the chronological order of historical development of genetic algorithm.	[7]
5	a)	Explain: i) Uniform Cross over ii) Matrix Cross over iii) Multi point Cross over.	[8]
	b)	What is mutation? How do you calculate mutation rate explain with an example.	[7]
6	a)	Define fuzzy relation? Discuss about the operations on relations.	[8]
	b)	Two fuzzy sets defined by A={(x1,0.3) (x2,0.7)(x3,1)} and B={(y1,0.4) (y2,0.9)} find R=A x B	[7]
7	a)	State the major implicit assumptions in a fuzzy control system design.	[8]
	b)	Explain the following membership value assignment i) Intuition ii) Inference iii) Rank ordering iv) Inductive reasoning	[7]
8		How can an Artificial Neural Network be applied for speed control of ac motor? Explain in detail.	[15]

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a)	Describe the performance comparison of Computer and Biological Neural	
	network.	[8]
b)	Explain the methods of AI techniques.	[7]
a)	Explain the PERCEPTRON And ADALINE models of an artificial neuron.	[8]
b)	Discuss various types of neural network architectures.	[7]
a)	Explain the Delta learning rule for multi-perceptron layer.	[8]
b)	Explain the training algorithm used to train the back propagation network	[7]
	Discuss various methods of selecting chromosomes for parents to crossover.	[15]
a)	What is meant by cross over rate? Explain its importance in GA.	[8]
b)	How do you represent the even and odd number of cross sites in multi point	
	cross over with neat schematic?	[7]
a)	Two fuzzy sets defined by $A = \{(x1,1) (x2,0.3)(x3,0.5)(x4,0.2)\}$ and	
	$B = \{(x1, 0.5) (x2, 0.4) (x3, 0.1) (x4, 1)\} \text{ find}$ i) may ii) min iii) complement of A & P iii) power sets	۲ 0 1
h)	Discuss the properties of crisp sets and compare with fuzzy sets	[0] [7]
0)	Discuss the properties of errsp sets and compare with fuzzy sets.	[/]
	Draw the block diagram of fuzzy logic system component and explain each	
	block.	[15]
	Explain the applications of AI techniques in the following fields	
a)	Speed Control of dc and ac motors	[8]
b)	Economic load dispatch unit	[7]
	 a) b) 	 a) Describe the performance comparison of Computer and Biological Neural network. b) Explain the methods of AI techniques. a) Explain the PERCEPTRON And ADALINE models of an artificial neuron. b) Discuss various types of neural network architectures. a) Explain the Delta learning rule for multi-perceptron layer. b) Explain the training algorithm used to train the back propagation network Discuss various methods of selecting chromosomes for parents to crossover. a) What is meant by cross over rate? Explain its importance in GA. b) How do you represent the even and odd number of cross sites in multi point cross over with neat schematic? a) Two fuzzy sets defined by A={(x1,1) (x2,0.3)(x3,0.5)(x4,0.2)} and B={(x1,0.5) (x2,0.4)(x3,0.1)(x4,1)} find