1059

B.E. (Computer Science and Engineering) Sixth Semester
Elective – I
CS-605B: Soft Computing

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt _five_ questions in all, including Question No. I (Section-A) which is compulsory and selecting two questions from each Section B-C.

x-x-x

Section-A

Q1.	a) Explain role of learning rate in neural networks	10
	b) Specify the working principle of fuzzy logic. List the applications of fuzzy logic.	
	c) Discuss Kalman filters briefly.	
	d) Draw architecture of Bayesian network.	
	e) What is the problem of local minima in genetic algorithms	

Section-B

Q2.	a) Consider the following planning problem:	5
	Initial state: Have(Cake)	
	Goal: Have(Cake) ∧ Eaten(Cake)	
	Action Eat(Cake): Precond: Have(Cake) Effect: ¬Have(Cake) ∧ Eaten(Cake)	
	Bake(Cake): Precond: ¬Have(Cake) Effect: Have(Cake)	
	Give a description of this planning problem in terms of propositional formula.	
	b) What is hidden in hidden Markov model? Discuss various applications where the hidden Markov model is used?	5

Q3.	Write a short note on	10
	a) knowledge representation under uncertainty b) Dempster Shafer theory	

Q4.	a) What are the common methods of de-fuzzification ? Illustrate the procedure with the help of an Example	5
		3
	b) Let A=((x1,0.5),(x2,0.7),(x3,0)) and B=(x1,0.8),(x2,0.2),(x3,1) are fuzzysets with associated membership values. Find AUB(x1), AUB)(x2),AUB)(x3).	
		2
	c) What is the necessity to convert the fuzzy quantities into crisp quantities?	

Section-C

Q5.	a) Calculate the output of neuron Y for the net shown in Figure. Use binary and bipolar input and sigmoidal activation functions.	7
	b) Describe some attractive features of the biological neural network that make it superior to the most sophisticated Artificial Intelligence computer system for pattern recognition tasks.	3

Q6.	a) Write a short note on :	10
	i) Data clustering Algorithms ii) Neuro fuzzy controls.	

Q7.	a) Suppose a genetic algorithm uses chromosomes of the form x = abcdefgh with a fixed length of eight genes. Each gene can be any digit between 0 and 9.	7
	Let the fitness of individual x be calculated as: f(x) = (a + b) − (c + d) + (e + f) − (g + h) , and let the initial population consist of four individuals with the following chromosomes:	
	x1 = 6 5 4 1 3 5 3 2 x2 = 8 7 1 2 6 6 0 1 x3 = 2 3 9 2 1 2 8 5· x4 = 4 1 8 5 2 0 9 4.	
	Evaluate the fitness of each individual, showing all your workings, and arrange them in order with the fittest first and the least fit last. Perform crossover over these population using partially mapped technique.	
	b) What is the use of selection operation in Genetic algorithm?	3