Course Name: Soft Computing

Course Outcome

CO1- Understand basics of Soft Computing including Artificial Neural Networks, Fuzzy Logic and Genetic Algorithms.

CO2- Demonstrate the ability to develop some familiarity with current research problems and research methods in Soft Computing by working on a research or design project.

CO3- Understand about the fundamental theory and concepts of neural networks, neuro modeling, several neural networks paradigms and its applications.

CO4- Design and implement the concepts of knowledge using fuzzy inference systems and other machine intelligence applications.

CO5- Identify an evolutionary computing paradigm known as genetic algorithms and its applications to engineering optimization problems.

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Mid Term Examination, Even Semester 2021-22
B. Tech. (CSE), IV Year, VIII Semester
Soft Computing (BCSE0103)

Time: 2 Hours **Maximum Marks: 30**

Instruction for students:

1. All parts of a question should be answered at one place.
2. Answer should be brief and to-the-point and be supplemented with neat sketches.
3. Any missing or wrong data may be assumed suitably giving proper justification.
4. Figures on the right-hand side margin indicate full marks.

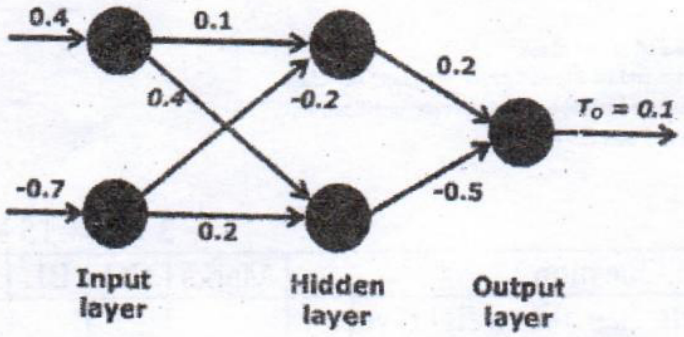
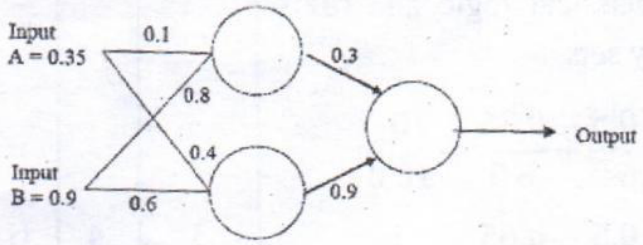
Section – A 3 X 5 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	A Neuron with 3 inputs has the weight vector w=[0.1, 0.3 -0.2]. The activation function is linear with the threshold being equal to 0.18. If input vector is [0.8 0.6 0.4] then determine the output of neuron?	3	3	A	P
2	Compare and contrast classical logic and fuzzy logic. Consider two fuzzy sets $A = \frac{1}{2.0} + \frac{0.65}{4.0} + \frac{0.5}{6.0} + \frac{0.35}{8.0} + \frac{0}{10.0}$ $B = \frac{0}{2.0} + \frac{0.35}{4.0} + \frac{0.5}{6.0} + \frac{0.65}{8.0} + \frac{1}{10.0}$ Find the following (a) $A \cup B$ (b) $\overline{A} \cup \overline{B}$ (c) Verify Demorgan's law.	3	4	U	C

3	Distinguish between soft computing and hard computing with a suitable example.	3	1	An	C
4	Discuss the structure of Biological neuron and compare it with the model of Artificial neural network.	3	1	R	F
5	Discuss the importance of machine learning in current scenario? Compare supervised and unsupervised learning techniques with suitable example.	3	2	U	M

Section – B

5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
1	Calculate new weights for a neural network given below using back propagation algorithm. [Use binary sigmoidal activation function] 	5	2	C	P
2	Calculate the output of a given neural network. [Use linear activation function and perform a forward pass on the network] 	5	3	C	P
3	Construct an architecture of multi-layer perceptron with 4-2-1 configuration. How Madaline network is formed? Also, build an architecture of Madaline to solve XOR problem.	5	1	C, U	F