# School of Computing Science and Engineering

Bachelor of Technology in Computer Science and Engineering
Mid Term Examination - May 2024

Duration : 90 Minutes
Max Marks : 50

Sem VI - R1UC611C - Soft Computing and Applications

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1) Sketch the model of artificial neuron. — K2 (2)

2) Compare and contrast the distinguishing features of soft computing and hard computing, utilizing specific examples to demonstrate each characteristic. — K1 (3)

3) If a customer provides a satisfaction rating of 0.8 using the "FQ_high" fuzzy quantifier, what does this rating signify in terms of their satisfaction level, and how would you interpret it? — K2 (4)

4) Provide two examples of real-world applications where soft computing techniques have been effectively utilized, and explain their significance in solving complex problems. — K2 (6)

5) Evaluate the sequential process of designing a fuzzy logic controller, examining each step's significance and contribution to the overall design. — K3 (6)

6) Obtain rhe output of the neuron Y for the network shown in Figure using activation functions as:
(i) binary sigmoidal and
(ii) bipolar sigmoidal — K3 (9)
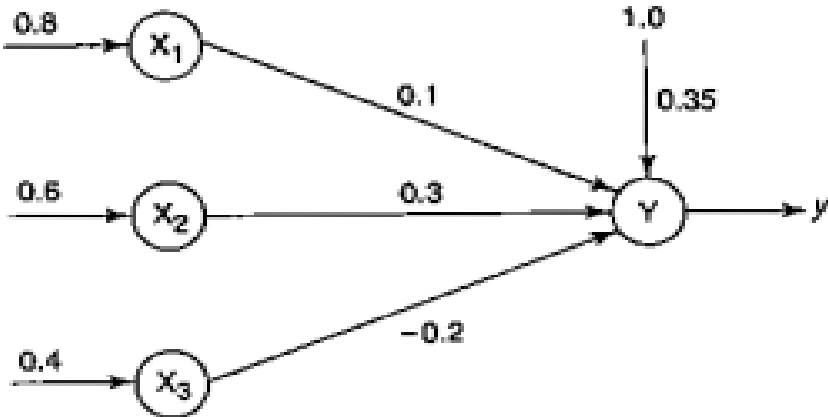
7) Analyze the interplay between the key components of computing systems within soft computing. Provide a real-world example illustrating the application of soft computing techniques, and evaluate how these techniques leverage the characteristics of soft computing to effectively address complex problems. K4 (8)

8) (a) Differentiate between Crisp set and Fuzzy set. (b) Let A be a fuzzy set defined by $A = .5/x1 + .4/x2 + .7/x3 + .8/x4 + 1/x5$. Find (i)All possible Alpha cut (ii)All possible strong alpha cut (iii) Support (iv) Is this fuzzy set a normal fuzzy set? If yes why? (v) Represent the above fuzzy set A in terms of special fuzzy sets αA. K4 (12)

OR

Given the two fully sets $B1 = \{1/1.0 + 0.75/1.5 + 0.3/2.0 + 0.15/2.5 + 0/3.0\}$, $B2 = \{1/1.0 + 0.6/1.5 + 0.2/2.0 + 0.1/2.5 + 0/3.0\}$ Find the following (a) B1 union B2 (b) B1 intersetion B2 (c) Compliment B1 (d) Compliment B2 (e) B1difference B2 (f) Compiment (B1 union B2) K4 (12)