

Enrollment No./ Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY

MASTER OF ENGINEERING - SEMESTER - 2 EXAMINATION – SUMMER 2026

Subject Code: 3720217

Date: 11-06-2026

Subject Name: Soft Computing

Time: 10:30 AM TO 01:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** 1. Differentiate: Traditional computing vs Soft computing **07**
2. State applications of soft computing
- (b)** Explain types of fuzzy membership functions **07**
- Q.2 (a)** Differentiate: **07**
1. Crisp set vs Fuzzy set
2. Biological Neural Network vs Artificial Neural Network
- (b)** Fuzzy sets A and B are defined as follows: **07**
 $A = \{(0.1, 0), (0.4, 1), (1, 2), (0.3, 3), (0.2, 4)\}$
 $B = \{(0.2, 0), (0.5, 1), (1, 2), (0.4, 3), (0.1, 4)\}$
Find (i). $A \cup B$, (ii). $A \cap B$ (C) $A \oplus B$ ($A \cap B$)'
- OR**
- (b)** Explain Support, core, normality, Cross over points, Bandwidth, fuzzy singleton and alpha cut with example **07**
- Q.3 (a)** Write short note on Fuzzy Expert System **07**
(b) Explain lifecycle of Genetic algorithms **07**
- OR**
- Q.3 (a)** Discuss various cross over methods in GA **07**
(b) Write short note on: **07**
1. Roulette Wheel Selection
2. Boltzmann Selection
- Q.4 (a)** Discuss various encoding methods in GA **07**
(b) 1. Supervised vs unsupervised learning **07**
2. State advantages of GA over traditional optimization methods
- OR**
- Q.4 (a)** 1. Define the terms: Chromosome, Activation function, learning rate **07**
2. State the applications of neural networks
(b) Explain various activation functions in Neural network **07**
- Q.5 (a)** Discuss in detail: Radial Basis Function Networks **07**
(b) Explain backpropagation algorithm **07**
- OR**
- Q.5 (a)** Write a short note on Adaptive Resonance Theory **07**
(b) Explain MATLAB/python fuzzy functions **07**
