

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2022

Subject Code:3172009**Date:12-01-2023****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.
4. Simple and non-programmable scientific calculators are allowed.

| | Marks |
|--|--------------|
| Q.1 (a) Discuss Importance of soft computing. | 03 |
| (b) Enlist and Explain main components of soft computing technique. | 04 |
| (c) Write short note on support vector machine. | 07 |
| Q.2 (a) Enumerate various activation functions of a neuron. | 03 |
| (b) How tournament selection strategy is comparable to roulette wheel selection strategy, if they are individually applied to genetic algorithm? | 04 |
| (c) Explain architecture and application of fuzzy-neural system. Give advantages and disadvantages of the same. | 07 |
| OR | |
| (c) Explain applications of soft computing in Machine vision. | 07 |
| Q.3 (a) Compare classical relations and fuzzy relations. | 03 |
| (b) Enlist and Explain properties of fuzzy sets. | 04 |
| (c) Enumerate various Defuzzification methods. Explain any two in detail. | 07 |
| OR | |
| Q.3 (a) Explain fuzzy interface system. | 03 |
| (b) Explain membership functions and its features. | 04 |
| (c) Design a fuzzy logic controller: Mamdani & sugeno architecture. | 07 |
| Q.4 (a) Compare biological neurons and artificial neural network. | 03 |
| (b) Explain Hebb network neuron model. | 04 |
| (c) Distinguish between supervised and unsupervised learning network. | 07 |
| OR | |
| Q.4 (a) Enlist various types of learning methods in neural network. | 03 |
| (b) Explain Mcculloh pitts neuron model. | 04 |
| (c) Explain neural network architecture with comparison to human nervous system. | 07 |
| Q.5 (a) Explain concept of genetic and evolution applied to probabilistic search techniques? | 03 |
| (b) Explain term Reproduction in Genetic Algorithm. | 04 |
| (c) What are the evolution steps of genetic algorithm? Draw flow chart. Explain selection methods applied to genetic algorithm. | 07 |
| OR | |
| Q.5 (a) Define (1) Encoding (2) chromosome (3) mutation | 03 |
| (b) Explain term Crossover in Genetic Algorithm. | 04 |
| (c) Explain any application of Genetic algorithm for single objective optimization problem. | 07 |