A–1308

Total Pages : 3 **Roll No. .....**

MCS-E2

(MCA)

Introduction to Soft Computing

Examination February, 2026

Time : 2:00 Hrs. Max. Marks : 70

Note* :–** This paper is of Seventy (70) marks divided into Two (02) Sections 'A' and 'B'. Attempt the questions contained in these Sections according to the detailed instructions given therein. ***Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

Section–A

(Long Answer Type Questions) (2×19=38)

***Note* :–** Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

1. Define Soft Computing. Explain its characteristics and discuss how soft computing differs "from hard computing. Also explain the role of fuzzy logic, evolutionary computation, and ANN in soft computing.

2. What are fuzzy membership functions ? Explain different types of membership functions with-diagrams. Discuss operations on fuzzy sets with suitable examples.

3. Describe are fuzzy Logic Controller (FLC) in detail. Explain its components, rule base, inference Engine, and defuzzification techniques.

4. Explain the Genetic Algorithm (GA). Discuss various GA operators such as encoding, selection, crossover, and mutation with suitable examples.

5. Describe the architecture of an Artificial Neural Network (ANN). Explain perceptron learning, ANN training techniques, and applications of neural networks.

Section–B

(Short Answer Type Questions) (4×8=32)

***Note* :–** Section 'B' contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. What are fuzzy relations ? Explain fuzzy implications with examples.
2. Write a short note on defuzzification techniques.
3. Explain selection operators used in Genetic Algorithms.
4. Differentiate between crossover and mutation in GA.
5. Write a short note on Evolutionary Computation (EC).
6. What are Multi-objective Evolutionary Algorithms (MOEA) ? Explain Pareto optimality.
7. Explain ANN learning methods (supervised vs. unsupervised).
8. Write a short note on applications of ANN in real-world problem solving.

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