

**A-0889**

**Total Pages : 4**

**Roll No. -----**

**MCS-E2**

**Introduction to Soft Computing**

**(MCA)**

**3<sup>rd</sup> Semester Examination 2024(Dec.)**

**Time: 2:00 hrs**

**Max. Marks: 70**

**Note :** This paper is of Seventy (70) marks divided into Two (02) Section 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.

**P.T.O.**

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## **Section-A (Long-Answer-Type Questions)**

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.

[2x19=38]

- Q.1. Explain the concept of Soft Computing and its significance in real-world applications. How does it differ from traditional computing?
- Q.2. Discuss the various operations on Fuzzy Sets. Explain, how do union, intersection, complement, and other operations differ from their classical set counterparts?
- Q.3. Explain the process of solving optimization problems using Genetic Algorithms. Discuss the key steps involved in applying a GA to an optimization problem.

- Q.4. Explain the concept of Evolutionary Computation (EC) in the context of optimization problems. Discuss its basic principles, types of EC techniques, and the advantages of using EC over traditional optimization methods.
- Q.5. Explain the architecture of Artificial Neural Networks (ANN). Discuss the different types of network architectures and their applications in various domains.

### **Section-B (Short-Answer-Type Questions)**

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.

[4x8=32]

- Q.1. Explain the different types of fuzzy membership functions with examples.

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- Q.2. Discuss the role and structure of Fuzzy Propositions.  
How fuzzy propositions are used in fuzzy logic systems?
- Q.3. How do Fuzzy Inference Systems (FIS) work, and what are the main types of fuzzy inference systems?
- Q.4. Explain the concept of Encoding in Genetic Algorithms. Discuss the different types of encoding methods used in Gas.
- Q.5. Explain the concept of Selection-II in Genetic Algorithms.
- Q.6. Discuss the two-point crossover technique and how it differs from one-point crossover with an example.
- Q.7. Discuss the Non-Pareto approach in Multi-Objective Evolutionary Algorithms (MOEA).
- Q.8. Explain the concept of overfitting and under fitting in the context of Artificial Neural Networks.

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