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Roll No

MCADD-801
M.C.A. (Integrated), VIII Semester
Examination, May 2024
Soft Computing

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) Define soft computing and its characteristics. Explain how soft computing differs from traditional computing approaches?
b) Write about the Radial Basis Function (RBF) and Robust Competitive Learning (RCL) in neural networks.
2. a) Write in detail about competitive learning and Kohonen maps for unsupervised learning tasks such as clustering and dimensionality reduction.
b) What is the basic idea behind LVQ (Learning Vector Quantization)? Describe the learning process in LVQ and Compare LVQ with other clustering algorithms.
3. a) What is SDM (Self-organizing Data Mining) and how does it relate to neural networks? Discuss the advantages and limitations of using SDM in data mining tasks.
b) Describe the structure and functioning of a Boltzmann machine. How does the energy-based approach govern the learning process in Boltzmann machines?

4.
 - a) Define membership function in the context of fuzzy sets. How is it used to represent uncertainty?
 - b) Discuss the principles of fuzzy inference. How are fuzzy rules combined to make decisions in a fuzzy inference system?
5.
 - a) Discuss the advantages and limitations of using fuzzy logic in control systems compared to traditional control methods.
 - b) Discuss the challenges and limitations encountered when applying genetic programming to practical problems.
6.
 - a) Discuss the examples of optimization problems where genetic algorithms have been successfully applied.
 - b) Discuss any ethical considerations or potential risks associated with the application of genetic algorithms in practice.
7.
 - a) How are rough sets used in data analysis and knowledge discovery? Discuss the significance of discernibility relations in rough set theory.
 - b) Explain the difference between deterministic chaos and randomness.
8. Write a short note on any two :
 - i) Chaos theory and its main principles
 - ii) Basic components of a genetic programming algorithm.
 - iii) Neural Networks and Probabilistic Reasoning
 - iv) Competitive learning
