

M.C.A. - I (Two Years Programme) (New BCS Pattern) Semester-II
PSMCAT202 - Paper-II : Soft Computing Techniques

P. Pages : 2

Time : Three Hours



GUG/W/24/13643

Max. Marks : 80

- Notes :
1. All questions are compulsory and carry equal marks.
 2. Draw neat and labelled diagrams wherever necessary.
 3. Avoid vague answers and write answers relevant and specific to questions only.

Either:

1. a) Differentiate between Soft Computing and Hard Computing with respect to artificial intelligence? 8
- b) Discuss the various types of Soft Computing techniques and their applications in brief. 8

OR

- c) Describe the different types of Production Systems used in Artificial Intelligence. 8
- d) Explain the working principles and applications of breadth-first search in Artificial Intelligence. 8

Either:

2. a) Define Artificial Neural Network (ANN) and discuss its significance in the field of machine learning. 8
- b) Differentiate between ANN and Human Brain. 8

OR

- c) Discuss the characteristics and applications of ADALINE (Adaptive Linear Neuron) in Neural Network systems. 8
- d) Explain the error backpropagation algorithm and its role in training multilayer neural networks. 8

Either:

3. a) What is fuzzy logic and how is it introduced in the context of artificial intelligence and decision-making systems. 8
- b) Discuss the differences between fuzzy sets and crisp sets in the context of set theory and their applications in real-world scenarios. 8

OR

- c) Discuss the principles of fuzzy reasoning and its role in drawing conclusions from fuzzy propositions and rules? 8
- d) Describe the process of defining membership functions for linguistic variables in a fuzzy logic system. 8

Either:

- 4. a) Explain the working principle of Genetic Algorithm. 8
- b) Write a detail note on Mutation Operator. 8

OR

- c) Differentiate between Genetic Algorithms and traditional optimization methods in handling non-linear and non-convex optimization problems. 8
- d) Explain generational cycles in Genetic Algorithm. 8

5. Solve all the questions.

- a) Write the AO* Algorithm. 4
- b) What is the structure and function of a single neural in the context of neural networks? 4
- c) Write the characteristics and advantages of membership functions in fuzzy logic systems. 4
- d) Explain the basic concepts of Genetic Algorithms and their role in simulating the process of natural selection and evaluation. 4
