Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

MCA (Sem.–3)
ARTIFICIAL INTELLIGENCE & SOFT COMPUTING
Subject Code : PGCA1926
M.Code : 90799
Date of Examination : 21-12-2023

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. **Write short notes on :**

   a) What is Soft Computing?

   b) Define AI techniques.

   c) What is Artificial Intelligence?

   d) Differentiate between syntax and semantics of languages.

   e) Define Fuzzy logic.

   f) Briefly explain the Water Jug problem.

   g) Explain the purpose of A* algorithm.

   h) Describe various Knowledge Representation Issues.

   i) What is memory Bounded Heuristic Search?

   j) Differentiate between Supervised Learning and Unsupervised Learning networks.

SECTION-B

2. What do you mean by Natural Language Processing? What are the features of natural languages that create challenges for processing of natural language by computers?

3. You have three jugs measuring 12 litres, 8 litres & 3 litres and a water faucet. You need to measure out exactly one litre. Use state space approach to solve this problem.

4. Discuss the salient features of propositional logic. Consider the following axioms and prove by resolution that "*Scrooge is not a child.*"

   a) Every child loves Santa.

   b) Everyone who loves Santa loves any reindeer.

   c) Rudolph is a reindeer and Rudolph has a red nose.

   d) Anything which has a red nose is weird or is a clown.

   e) No reindeer is a clown.

   f) Scrooge does not love anything which is weird.

5. Differentiate tree based breadth-first and depth-first search strategies based on completeness, time and space complexities.

SECTION-C

6. **Write a short note on the applications of the following :**

   a) Neuro-fuzzy modelling

   b) Neural networks to pattern recognition system such as character recognition

   c) Genetic algorithm.

7. Explain the working principle of genetic algorithm. Discuss the significance of fitness function. Also, write about multi-level optimization.

8. a) Draw the architecture of backpropagation algorithm.

   b) Explain with Fuzzy logics the help of examples, how is it different from the crisp logic?

9. Write a detailed note on neural networks. What is the role of activation functions? Draw and explain a single layer perceptron in detail.

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.