

Roll No. ....

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CMTE/D-24

**24061**

## **INTELLIGENT SYSTEMS**

Paper-MT-CSE-20-14 (i)

Time allowed : 3 Hours]

[Maximum Marks : 75

**Note :** Attempt **five** questions in all, selecting **one** question from each unit. Question No. **1** is compulsory. All questions carry equal marks.

### **Compulsory Question**

1. Attempt all questions:

- (i) What are the different activation functions in ANN?
- (ii) In what situations would you prefer depth-first search over breadth-first search and why?
- (iii) What is Robinson's resolution principle?
- (iv) What are the limitations of bi-valued logic in representing the knowledge?

### **UNIT-I**

2. (a) Explain the basic architecture of a neural network, including its input layer, hidden layers and output layer.
- (b) What are genetic algorithms and how do they use principles of natural selection and evolution to optimise solutions?

3. (a) Define fuzzy logic and explain how it differs from traditional binary logic.
- (b) What is the difference between supervised and unsupervised learning in the context of neural networks?

### **UNIT-II**

4. (a) What is breadth-first search and why is it considered complete? In which cases might it not be the most efficient approach?
- (b) Explain why iterative deepening search is memory-efficient compared to BFS, while still being complete.
5. (a) Explain how beam search differs from best-first search and its advantages and disadvantages in practical applications.
- (b) What is A\* algorithm? Explain the concept of an admissible heuristic.

### **UNIT-III**

6. (a) Explain the difference between declarative and procedural knowledge with examples.
- (b) Compare and contrast frames and scripts as structured representations. In what scenarios is each one preferable?
7. (a) Write a note on different inference rules in propositional logic.
- (b) What are the desirable characteristics of a knowledge representation scheme? Discuss.

## **UNIT-IV**

8. (a) Describe the concept of belief and plausibility in the Dempster-Shafer Theory. How do they help quantify uncertainty?  
(b) Differentiate between crossover and mutation in genetic algorithm using suitable examples.
9. (a) Explain Bayes' theorem. How does it update the probability of a hypothesis given new evidence?  
(b) Describe how decision trees work as an inductive learning method and their advantages and disadvantages.