

Roll No. ....

Total Pages : 03

**CCMTE/D-23**

**24061**

INTELLIGENT SYSTEMS

MT-CSE-20-14(i)

Time : Three Hours]

[Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

**Compulsory Question**

1. (a) What is the difference between crossover and mutation operations in Genetic Algorithm ? Illustrate.
- (b) What are the different categories of knowledge representation schemes ? Discuss.
- (c) Differentiate between fuzzification and de-fuzzification.
- (d) What is informed search ? List the different informed search techniques.

**Unit I**

2. (a) What is Artificial Neural Networks ? Discuss the various types of learning used in Artificial Neural Networks.

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- (b) What are the advantages of genetic algorithm over conventional search techniques ? Discuss.
- 3. (a) What are fuzzy sets ? Discuss the properties of fuzzy sets.
- (b) What is a Recurrent Neural Network (RNN) ? What are its advantages and limitations ? Discuss.

## Unit II

- 4. (a) What is depth first search with iterative deepening ? What are its merits and demerits over Breadth First Search and Depth First search ? Discuss.
- (b) What are rank selection and roulette wheel selection in genetic algorithm ? Discuss using suitable examples.
- 5. (a) What is hill climbing search ? What is the difference between steepest ascent hill climbing and stochastic hill climbing ? Explain.
- (b) What is Breadth First Search ? Write its algorithm and discuss time and space complexities.

## Unit III

- 6. (a) What is First Order predicate Logic ? Differentiate between modus ponens and modus tollens inference rules using suitable examples from FOPL.

- (b) What is a blackboard architecture model ? What are the components in blackboard pattern ? Discuss.

- 7. (a) What are the differences between declarative frames and procedural frames ? Illustrate.
- (b) What are conceptual graphs ? Also explain their characteristics.

## Unit IV

- 8. (a) Write a detailed note on Stanford certainty factor algebra.
- (b) What is Learning ? What is the difference between induction and abduction ? Illustrate.
- 9. (a) What is inductive inference ? What are the rules of inductive learning ? Discuss.
- (b) What are the limitations of bi-valued logic in representing uncertainty ? How is it handled in fuzzy logic ? Discuss.