

May 2025

B.Tech. (Sixth Semester)

Intelligent Systems (PCC-CS-601)

Time : 3 Hours]

[Maximum Marks : 75

Note : It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

Part A

1. (a) What are the application areas of an intelligent system ?
- (b) What are the different types of learning in ANN ?
- (c) Explain the terms core and height of a fuzzy set.
- (d) Explain how IDDFS is better than BFS or DFS.
- (e) Explain the water-jug problem.

- (f) Discuss the various ways of knowledge representation.
- (g) Explain induction learning.
- (h) What are Evolutionary Algorithms ? Give example.
- (i) Discuss, why a backpropagation network is required ?
- (j) What do you mean by problem reduction in AI ? 1.5×10=15

Part B

- 2. (a) Differentiate between BNN and ANN. 5
- (b) Why Recurrent Neural Network is preferred in AI, how many layers can be there in RNN ? Write the disadvantages of RNN if any. 10
- 3. (a) Why fuzzy logic was introduced ? Design a fuzzy set for the human age. 5
- (b) What is a Genetic Algorithm ? and why is it used ? Explain the various Genetic Operations. 10

4. (a) Show that $P \rightarrow S$ is provable from the set $\{P \rightarrow Q, Q \rightarrow R, R \rightarrow S\}$ using semantic tableaux method. 5
- (b) Explain the A^* algorithm. How is it different from Hill Climbing ? Why is it called an optimized algorithm ? 10
5. (a) Show that $(\sim W \vee R)$ is a logical consequence of a set $\{\sim P \vee Q, \sim Q \vee R, \sim W \vee P\}$ using the resolution refutation method. 5
- (b) What is an Expert System ? Explain its architecture in detail along with inferencing techniques. 10
6. (a) What is Reasoning ? What are its types ? Also, explain inductive and deductive reasoning with examples. 5
- (b) Explain Dempster Shafer's Theory of Evidence along with its advantages and disadvantages. 10
7. Write short notes on the following : 15
- (a) Blackboard architecture
- (b) Semantic nets and Frames
- (c) AO^* algorithm

