BE2-R4 : ARTIFICIAL INTELLIGENCE & NEURAL NETWORKS

NOTE :

1. **Answer question 1 and any FOUR from questions 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

Time: 3 Hours   **Total Marks: 100**

1. (a) Explain the challenges of Artificial Intelligence in Real World.

    (b) Compare Breadth first search and depth first search.

    (c) Define Tautology and truth table.

    (d) Convert the following sentence into predicate logic:

       • All Pompeians were Romans
       • Every one is loyal to someone

    (e) Explain the significance of Membership Function in Fuzzy systems.

    (f) Explain MCP neuron model.

    (g) Explain the term Linearly Seperable Patterns and explain the XOR problem in the context of linearly seperability.

                                                (7 × 4)

2. (a) Define Single-state problem formulation.

    (b) Explain the concept of Iterative Deepening Depth-First Search.

    (c) Describe how Problem Reduction is done with AO* Algorithm.

                                                (6 + 6 + 6)

3. (a) List the basic components of First Order Logic (FOL) or predicate logic.

    (b) What are Semantic Networks? Explain with the help of an example.

    (c) Explain the various components of Natural Language Processing.

                                                (6 + 6 + 6)

4. (a) Write a program in PROLOG to verify if a word is a palindrome.

    (b) What is the significance of Interface Engine in Expert Systems? Discuss forward chaining and backward chaining strategies.

    (c) Explain the Expert System Architecture.

                                                (6 + 6 + 6)

5. (a) Discuss how rate of learning effects Back propagation algorithm.
(b) Explain types of Artificial Neural Network architectures.

(c) Explain Error Back propagation algorithm.

(6 + 6 + 6)

6. Explain following types of learning rules:
(a) Hebb's Learning Rule
(b) Delta Learning Rule

(c) Perceptron Learning Rule

(6 + 6 + 6)

7. Write short notes on the following:

(a) Bottom up Parsing Techniques

(b) Characteristics of A.I. Programs

(c) Hill-Climbing Search

(6 + 6 + 6)

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