

BE2-R4: ARTIFICIAL INTELLIGENCE AND 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) Mention disadvantages of Hill climbing as a search technique and possible solutions of each?
- b) What is machine learning? Differentiate between Supervised Learning and Inductive Learning.
- c) Narrate: Non monotonic Reasoning Systems.
- d) Elaborate in brief: Hebb's rule and Delta rule.
- e) What is Hopfield Network? What do you mean by Hopfield Law? What are the major limitations of it?
- f) Describe in brief various steps involved in NLP (Natural Language Processing).
- g) Explain the architecture of knowledge based system.

(7x4)

2.

- a) Explain Back propagation Artificial Neural Network.
- b) Explain learning rule of Back propagation ANN.

(9+9)

3.

- a) Write significance of expert system shell. Elaborate Expert System Architecture with its entire components in brief.
- b) Justify the use of fuzzy logic in AI. What are the criticisms for fuzzy logic? Narrate Fuzzy Rule Based Systems.

(9+9)

4.

- a) Explain the three concepts Probability, Uncertainty and Belief. Explain Bayes' theorem.
- b) What is Perceptron? Explain Multilayer Perceptron in brief.

(9+9)

5.

- a) For each of the following statements, show a Parse Tree. For each of them, explain what knowledge in addition to the Grammar of the English, is necessary to produce the correct Parse Tree.

The chef cooks the soup.

- b) Explain Conditional Probability in brief. How is it related with the concept of Event and Circumstances?
- c) Explain forward and backward chaining. Under what conditions would it make sense to use both forward and backward chaining? Give an example where both are used.

(6+6+6)

6.

- a) Write a PROLOG program to perform different operations like addition, subtraction, multiplication and division.
- b) Write a PROLOG program to find factorial of given number.
- c) Write a PROLOG program to display following patterns. (n -- n³)

(6+6+6)

7.

- a) Explain: Intelligence and Artificial Intelligence. How do you distinguish between the two? Explain AI application areas.
- b) How to classify a problem in AI? What are the seven problem characteristics?
- c) Distinguish between Heuristic and Algorithm. Support your answer with the help of an example. Write down the steps of AO* algorithm as a heuristic search technique.

(6+6+6)