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) Discuss supervised learning and unsupervised learning in neural networks.

b) Enlist the various applications of Artificial Neural Network (ANN).

c) What is state space search? Give some examples of state space search algorithms.

d) Describe in brief various steps involved in NLP (Natural Language Processing).

e) What is Constraint Satisfaction Problem?

f) Explain the term Linearly Separable Patterns and explain the XOR problem in the context of linearly seperability.

g) Explain Turing Test Intelligence of Artificial Intelligence (AI) system.

(7x4)

2.

a) Define self-organizing network. Explain Kohonen's Networks. What is the learning process of Kohonen Networks?

b) What do you understand with Artificial Intelligence? What are basic AI techniques? List the name of problems those falls into the formal, mundane and expert tasks.

(8+10)

3.

a) Explain Multi-Layer Perceptron (MLP). Draw architecture of MLP and list applications of MLP.

b) Explain steps of AO* algorithm.

(9+9)

4.

a) Compare the Breadth First Search (BFS) and Depth First Search (DFS) in brief. Write applications of BFS and DFS.

b) Explain Biological Neuron. What is "Whole Cell" measurement technique? Draw a diagram of three stages of Biological Neural System.

(9+9)

5.

a) Discuss Hopfield Neural Network. Explain architecture of Hopfield Neural Network.

b) Solve "Water Jug problem" using Production rule system technique. There are two 2 jugs, a 4 liter one and a 3 liter one. Neither has any measuring marker on it. There is a pump that can be used to fill the jugs with water. How can we get exactly 2 liters of water in to the 4-liter jugs?

(9+9)

6.

a) Construct semantic network for the following sentence: I own a tan leather chair.

b) Explain forward chaining and backward chaining with diagram.

c) Draw a diagram for the development of a knowledge based system. List out the limitations with Knowledge Based Systems Development Process.

(6+6+6)

7.

a) Explain the algorithm of Steepest ascent Hill climbing. Define local maximum state, Plateau state and ridge state.

b) Explain Back Propagation Learning. Draw a diagram of process of Back propagation Learning and list applications of it.

(9+9)