

BE2-R4 : ARTIFICIAL INTELLIGENCE & NEURAL NETWORKS**NOTE :**

1. Answer question 1 and any FOUR questions from 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) What is AI ? Explain Turing Test.
 (b) Differentiate between Uninformed Search (Blind search) and Informed Search (Heuristic Search) strategies.
 (c) Define fuzzy logic.
 (d) What are heuristic functions ?
 (e) What is the problem faced by hill-climbing search ?
 (f) What are the characteristics of partial order planner ?
 (g) Define the first order definite clause with example. (7x4)
2. (a) Explain briefly the minimax algorithm.
 (b) Consider a water jug problem: you are given two jugs, a 4 gallon one and a 3-gallon one. Neither have any measuring markers on it. There is a pump that can be used to fill the jugs with water. How can you get exactly 2 gallons of water into the 4-gallon jug. Explain the algorithm. (9+9)
3. (a) What are the steps to convert first order logic or predicate logic sentence to normal form ? Explain each step.
 (b) Explain in detail about forward chaining and backward chaining with examples. (9+9)
4. (a) Discuss the characteristics of the Hopfield model followed by an account of its training and recognition stages.
 (b) Describe the architecture of the Kohonen network and the formation of the so-called *topological map* through training. (9+9)
5. (a) Marie's marriage is tomorrow. In recent years, each year it has rained only 5 days. The weatherman has predicted rain for tomorrow. When it actually rains, the weatherman correctly forecasts rain 90% of the time. When it doesn't rain, the weatherman incorrectly forecasts rain 10% of the time. The question: What is the probability that it will rain on the day of Marie's wedding.
 (b) Explain delta rule for single output unit in neural network.
 (c) Consider the following axioms.
 1. All hounds howl at night.
 2. Anyone who has any cats will not have any mice.
 3. Light sleepers do not have anything which howls at night.
 4. John has either a cat or a hound.
 5. If John is a light sleeper, then John does not have any mice.
 Convert these axioms as a well-formed formula in first-order predicate calculus. (6+6+6)

6. (a) Define Agent and Explain Agent types.
(b) Discuss architecture of ANN (9+9)
7. (a) What is Augmented Transition Networks (ATNs) ? Discuss the components and parsing with Augmented Transition Network (ATN).
(b) Write short note on Depth-first Branch and Bound search technique. (9+9)

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