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1607E566

Candidate's Seat No : _____

M.Sc. (AIML & D.S.) Sem.-1 (A.T.K.T.) Examination

Artificial Intelligence

Time : 3-00 Hours]

July-2024

[Max. Marks : 100

Instructions:

- **Write both the Sections in the separate answer book.**
- **Both Sections having equal weightage.**
- **Draw Diagrams wherever necessary.**
- **Make Assumptions wherever necessary.**

SECTION – I

- Q-1 Explain the difference between following terms, with an appropriate example if necessary: (15)
- a. Reactivity and Proactivity
 - b. Simple Hill Climbing and Steepest Ascent Hill Climbing
 - c. Propositional Logic and Predicate Logic
 - d. Monotonic Reasoning and Non-Monotonic Reasoning
 - e. Simple Reflex Agent and Model Based Reflex Agent
- Q-2 Attempt the following: (**any three**) (15)
- a. Explain the Magic Square Strategy to solve the Tic-Tac-Toe problem in detail.
 - b. Explain the types of Environments in detail.
 - c. Write the PEAS description of Traffic Control agent and Robot House Maid.
 - d. Write the environment types of Chess Playing agent and Personal Assistant agent (eg: Siri, Alexa).
 - e. Explain Simple Hill Climbing method.

(P. T.O)

- Q-3 Attempt the following: **(any two)** (20)
- Explain Steepest Ascent Hill Climbing method. What are the problems faced upon using Hill Climbing methods and how do we overcome them?
 - Write the predicate logic for following sentences and perform backward chaining to find the answer of the question.
 - John likes all kinds of food.
 - Apples are food.
 - Anything anyone eats and is not killed by is food.
 - Bill eats peanuts and is still alive.
 - Sue eats everything that Bill eats.
 Prove that: John likes peanuts.
 - Explain Best First Search algorithm and A* algorithm in detail along with examples.

SECTION – II

- Q-4 Explain Goal-based and Utility-based Agents, with respective diagrams and example. (10)
- Q-5 Attempt the following: **(any two)** (20)
- Explain Certainty Factor Theory and Utility Theory in detail.
 - Write the predicate logic for following sentences:
 - Everyone can't swim in floods.
 - Nobody likes taxes.
 - Mary likes everybody who likes to play chess.
 - Someone is loyal to everyone.
 - Anything anyone can get to read from library is a book.
 - Explain Minimax algorithm and Alpha-Beta pruning in detail. Explain how Alpha beta pruning is better.
- Q-6 Attempt the following: (20)
- Explain **any four** problem characteristics for the given problems (with reasons):
Tic-tac-toe, Chess, Travelling Salesman, 3 water jug, 8 puzzle.