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B.TECH.
(SEM VII) THEORY EXAMINATION 2022-23
ARTIFICIAL INTELLIGENCE

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

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2x10 = 20

(a) Define Artificial Intelligence. Is it different from intelligence?
(b) Describe the turing test for intelligence.
(c) Differentiate between uninformed search and informed search.
(d) For tic toe game, draw a game tree from root node (initial stage) to leaf node (win or lose) in AI.
(e) Describe the concept of Unification in AI.
(f) Write some general syntax for a prolog program.
(g) Define speech act theory. How will you define the following speech act, if performative and content are defined as-
performative = request
content = "the door is closed"
speech act = ?
(h) Differentiate between reactive agent and deliberative agent.
(i) List various applications of Artificial Intelligence.
(j) Discuss the concept of Information retrieval.

SECTION B

2. Attempt any *three* of the following: 10x3 = 30

(a) Explain PEAS and properties of task environments. Write the PEAS description of the task environment for an automated car driving system.
(b) (i) Discuss hill climbing search techniques and show all the drawbacks in graph with details.
(ii) Evaluate Constraint Satisfaction problem with an algorithm for solving a Cryptarithmetic problem

CROSS
+ ROADS
= DANGER

(c) Summarize the following sentences into symbolic forms (FOL).

(i) Everyone is loyal to someone.
(ii) All romans were either loyal to Caesar or hated him.
(iii) you can fool all of the people some of the time.
(iv) No purple mushroom is poisonous.
Everyone has a heart

(d) Define the two types of agent communication language (ACL). Explain in details with some examples.
(e) What is the role of following in AI:
(i) Machine Translation
(ii) Speech recognition

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SECTION C

3. Attempt any *one* part of the following: 10x1 = 10

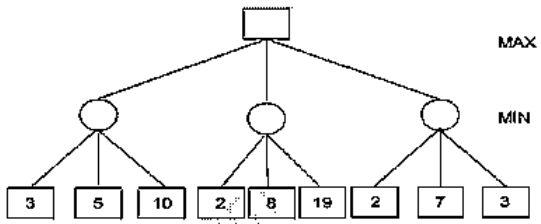
(a) Define the water jug problem in AI.Also suggest a solution of it.

(b) Explain the role of Intelligent Agent in AI. Also explain all types of intelligent agents in details.

4. Attempt any *one* part of the following: 10 x1 = 10

(a) Discuss A* search techniques. Prove that A* is complete and optimal. Justify with example.

(b) What is alpha-beta pruning?How alpha-beta pruning can improve MIN MAX algorithm? Evaluate the given problem using alpha-beta pruning.



5. Attempt any *one* part of the following: 10x1 = 10

(a) Explore the knowledge-based agent with a diagram. How does the inference engine contribute to learning?

(b) "As per the law, it is a crime for an American to sell weapons to hostile nations. Country A, an enemy of America, has some missiles, and all the missiles were sold to it by Robert, who is an American citizen." Justify "Robert is criminal." By applying- Forward-chaining algorithm OR Backward-chaining algorithm.

6. Attempt any *one* part of the following: 10x1 = 10

(a) Explain in detail the contract net protocol used for communication between multi agent systems. Also explain each stages of the protocol.

(b) Describe the following in terms of multi software agent system: (Any Two)

(i) Argument
(ii) Negotiation
(iii)Bargaining

7. Attempt any *one* part of the following: 10x1 = 10

(a) Discuss the role of NLP in AI. Describe the stages of natural language processing in artificial intelligence.

(b) What is Robotics?Differentiate between Robotic System and Other AI Program. Describe the various Components of a Robot. How does the computer vision contribute in robotics?

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