Code:20AI601PC | SET-II | HT NO: | | | 7 | R | | | | | |

# CMR TECHNICAL CAMPUS

## UGC AUTONOMOUS

**B.Tech. VI Semester Regular End Examinations, May-2023**

**Artificial Intelligence**

**Department of CSM**

**Time: 3 Hours** **Max. Marks: 70**

**Note**

i. This Question paper contains Part- A and Part- B.
ii. All the Questions in Part A are to be answered compulsorily.
iii. All Questions from Part B are to be answered with internal choice among them.

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**PART-A**

**10 X 02 = 20 Marks**

| | | | Marks | CO | BL |
|---|---|---|---|---|---|
| 1. | a | What are the four basic types of agent program in any intelligent system? | 2 | CO1 | L2 |
| | b | Define a problem and its components. | 2 | CO1 | L1 |
| | c | List some of the rules of inference. | 2 | CO2 | L2 |
| | d | Define the structure of Problem. | 2 | CO2 | L2 |
| | e | Describe models for first order logic | 2 | CO3 | L2 |
| | f | Outline categories and objects in Knowledge Representation? | 2 | CO3 | L1 |
| | g | How do you plan with Time, Schedules, and Resources? | 2 | CO4 | L1 |
| | h | What is Classical Planning? | 2 | CO4 | L1 |
| | i | Define Relational and First-Order Probability? | 2 | CO5 | L1 |
| | j | Describe learning Using Relevance Information? | 2 | CO5 | L2 |

**PART- B**

**5 X 10 = 50 Marks**

| | | | Marks | CO | BL |
|---|---|---|---|---|---|
| 2. | a | How an algorithm's performance is evaluated? Compare different uninformed search strategies in terms of the four evaluation criteria. | 5 | CO1 | L4 |
| | b | Discuss the characteristics of AI problem. Can Towers of Hanoi problem be considered as AI problem? Justify your answer with suitable | 5 | CO1 | L6 |
| | | OR | | | |
| 3 | a | Explain in detail about Uninformed Search and Informed Search Strategies. | 5 | CO1 | L5 |
| | b | Illustrate Greedy Best First Search? Explain with an example the different stages of Greedy Best First search. | 5 | CO1 | L4 |

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| 4 | a | Differentiate propositional logic with FOL. List the inference rules along with suitable examples for first order logic | 5 | CO2 | |
| | b | Explain Adversarial search problem with example | 5 | CO2 | L5 |
| | | OR | | | |
| 5 | a | Explain alpha beta pruning with example? | 5 | CO2 | L5 |
| | b | Propose resolution proof for "West is a criminal" problem statement | 5 | CO2 | L6 |
| 6 | a | Write down logical representations for the following sentences suitable to use with Generalized Modus Ponens:<br>(a) Horses, cows and pigs are mammals<br>(b) An offspring of a horse is a horse<br>(c) Bluebeard is a horse | 5 | CO3 | L6 |
| | b | Explain the syntactic elements of first-Order logic | 5 | CO3 | L5 |
| | | OR | | | |
| 7 | a | Explain about the Backward & Forward Chaining with example. | 5 | CO3 | L6 |
| | b | What are Reasoning Systems for Categories in Knowledge Representation? | 5 | CO3 | L4 |
| 8 | a | How to select plan and act in Non-deterministic Domains and what are some examples of such domains? | 5 | CO4 | L3 |
| | b | Explain the use of planning graph in providing better heuristic estimation with suitable example? | 5 | CO4 | L5 |
| | | OR | | | |
| 9 | a | Classify Algorithms for Planning with State-Space Search and how do they work? | 5 | CO4 | L4 |
| | b | Explain Planning Graphs and how do they work? | 5 | CO4 | L5 |
| 10 | a | Categorize Forms of Learning and how do they differ from each other? | 5 | CO5 | L4 |
| | b | Discuss about the Supervised Learning and list the advantages? | 5 | CO5 | L6 |
| | | OR | | | |
| 11 | a | Interpret Inductive Logic Programming and how does it differ from other types of programming? | 5 | CO5 | L5 |
| | b | Discus about learning Decision Trees and how do they work? | 5 | CO5 | L6 |

**CO : Course Outcomes**

**BL : Bloom's Taxonomy Levels** **L 1 : Remembering** **L 2 : Understanding** **L 3 : Applying** **L 4 : Analysing** **L 5 : Evaluating** **L 6 : Creating**

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# CMR TECHNICAL CAMPUS

## UGC AUTONOMOUS

## B.Tech.VI Semester Supply End Examinations, January-2024

## Artificial Intelligence

## Department of CSM

**Time: 3 Hours** **Max. Marks: 70**

**Note**

i. This Question paper contains Part- A and Part- B.
ii. All the Questions in Part A are to be answered compulsorily.
iii. All Questions from Part B are to be answered with internal choice among them.

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**PART-A**

**10 X 02 = 20 Marks**

| | | | Marks | CO | BL |
|---|---|---|---|---|---|
| 1. | a | Define an Agent? | 2 | CO1 | L1 |
| | b | Outline the characteristics of intelligent agent | 2 | CO1 | L2 |
| | c | Distinguish between prepositional & predicate logic | 2 | CO2 | L4 |
| | d | Define forward and backward chaining | 2 | CO2 | L1 |
| | e | Explain about generic knowledge-based agent. | 2 | CO3 | L2 |
| | f | What is Unification and Lifting? | 2 | CO3 | L1 |
| | g | How do you plan and act in Non-deterministic Domains? | 2 | CO4 | L1 |
| | h | Summarize the Algorithms for Planning with State-Space Search? | 2 | CO4 | L2 |
| | i | Demonstrate performing Inference Using Full Joint Distributions? | 2 | CO5 | L2 |
| | j | How do you Represent Knowledge in an Uncertain Domain? | 2 | CO5 | L1 |

**PART- B**

**5 X 10 = 50 Marks**

| | | | Marks | CO | BL |
|---|---|---|---|---|---|
| 2. | a | Explain Depth First Search and Breadth First search with Suitable examples. | 5 | CO1 | L5 |
| | b | Discuss A* algorithm with an example | 5 | CO1 | L6 |
| | | OR | | | |
| **3** | a | Discuss Hill Climbing search method | 5 | CO1 | L6 |
| | b | Explain the local search algorithm with example. | 5 | CO1 | L5 |
| **4** | a | Differentiate propositional logic with FOL. List the inference rules along with suitable examples for first order logic | 5 | CO2 | L4 |
| | b | Elaborate the procedure to convert the formula in | 5 | CO2 | L6 |

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| | | proportional logic into CNF. Convert the formula (~A->B)^(C^A)into its equivalent CNF representation. | | | |
| | | OR | | | |
| **5** | a | Discus solutions for the map-coloring problem | 5 | CO2 | L6 |
| | b | Explain the syntactic elements of first-Order logic | 5 | CO2 | L6 |
| **6** | a | Interpret the limitations of Predicate logic as a tool for Knowledge representation? Illustrate through examples. | 5 | CO3 | L5 |
| | b | Classify Mental Events and Mental Objects in Knowledge Representation? | 5 | CO3 | L4 |
| | | OR | | | |
| **7** | a | Develop logical representations for the following sentences suitable to use with Generalized Modus Ponens:<br>(a) Offspring and parent are inverse relations<br>(b) Every mammal has a parent. Draw the proof tree generated by an exhaustive back-ward chaining algorithm for the query ∃h Horse(h). | 6 | CO3 | L6 |
| | b | Justify reasoning with Default Information? | 4 | CO3 | L5 |
| **8** | a | Explain plan and act in Non-deterministic Domains and what are some examples of such domains? | 5 | CO4 | L5 |
| | b | Illustrate the working of Classical Planning and how does it work? | 5 | CO4 | L4 |
| | | OR | | | |
| **9** | a | Evaluate the analysis of Planning approaches and what are the criteria for analysis? | 5 | CO4 | L5 |
| | b | Explain Hierarchical Planning and how does it differ from Classical Planning | 5 | CO4 | L4 |
| **10** | a | Explain the impact of uncertainty in probabilistic reasoning? | 5 | CO5 | L5 |
| | b | Computeinference Using full joint distributions and what are the advantages and disadvantages of this approach? | 5 | CO5 | L4 |
| | | OR | | | |
| **11** | a | Explain Bayes' Rule and its utilization in probabilistic reasoning | 5 | CO5 | L5 |
| | b | Write in detail about Relational and First-Order Probability and how does it differ from other types of probability? | 5 | CO5 | L6 |

**CO : Course Outcomes**

**BL : Bloom's Taxonomy Levels** **L 1 : Remembering** **L 2 : Understanding**

**L 3 : Applying** **L 4 : Analysing**

**L 5 : Evaluating** **L 6 : Creating**

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