SVKM
Mithibai College (Arts, Sci & Comm)

Programme: B.Sc (Computer Science) - (CBCGS)
Year: III/Semester V(Exam Year: 2023-2024)
Subject: ARTIFICIAL INTELLIGENCE
Date: 17 Oct 2023 **Time: 10:30 am to 01:00 pm (02:30 Hrs.)**
Max. Marks: 75

FINAL EXAMINATION (Acad. Year:**2023-2024)**

Instructions:
1. This question paper contains 2 pages.
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3. All questions are compulsory.
4. Answer to each new question to be started on a fresh page.
5. Figures in brackets on the right hand side indicate full marks.

Q1. ATTEMPT ANY THREE **(15)**

A. What are different types of AI?

B. Explain the working of a goal-based agent with its diagram.

C. Explain A* search strategy with an example.

D. Explain the state landscape with respect to hill climbing with its diagram.

Q2. ATTEMPT ANY THREE **(15)**

A. How categories are used in knowledge representation?

B. Write the backward chaining algorithm.

C. How an object can be represented as fluent in knowledge representation? Explain with an example.

D. Write a note on Truth Maintenance system.

Q3. ATTEMPT ANY THREE **(15)**

A. Explain Bayesian network with an example.

B. How to construct a Bayesian network?

C. Write the prior sampling algorithm of approximate inferencing in Bayesian network

D. How filtering is achieved in probabilistic reasoning over time?

Q4. ATTEMPT ANY THREE **(15)**

A. Explain deriving solution to a sequential decision problem.

B. Explain optimal policies with utilities of states.

C. Explain the working of Naïve Bayes model with an example.

D. Explain the working of direct utility estimation technique of passive reinforcement learning.

Q5. ATTEMPT ANY THREE **(15)**

A. Explain the characteristics of the task environment of crossword puzzle.

B. The law says that it is a crime for an American to sell weapons to hostile nations. The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by Colonel West, who is American. Prove that Col. West is a criminal using forward chaining algorithm.

C. Explain the rejection sampling method of approximate inferencing in Bayesian network with an example.

D. Explain Q-learning in active reinforcement learning.

15 OCT 2022

SVKM'S
Mithibai College of Arts, Chauhan Institute of Science &
Amrutben Jivanlal College of Commerce and Economics (Autonomous)
Academic Year (2022-23)
Class: TYBSc Semester: V

Program: B. Sc. Computer Science
Course Name: Artificial Intelligence
Course Code: USMACS501 A
Date:

Max. Marks: 75
Time: 10:30 a.m to 1:00 p.m
Duration: 2 hrs 30 minutes

REGULAR EXAMINATION

Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

1) This question paper contains TWO pages.
2) All questions are compulsory.
3) All FOUR questions to be attempted.
4) Answer to each new question to be started on a fresh page.
5) Figures in brackets on the right hand side indicate full marks.
6) Assume suitable data if necessary
7) Draw diagrams wherever suitable

Q1	**ATTEMPT ANY THREE**	**21**
A	Explain the Turing test. What capabilities are required by an AI system to pass the Turing test?	7
B	Explain the working of a learning based agent with a diagram.	7
C	What is a well-defined problem and what are its components?	7
D	Explain A* search strategy with an example.	7

Q2	**ATTEMPT ANY THREE**	**21**
A	State the forward chaining algorithm.	7
B	How physical compositions & composite objects be represented in knowledge representations? Explain with examples.	7
C	What aspects of knowledge can be represented using semantic networks?	7
D	How default logic is used for knowledge representation? Explain extension of default theory.	7

Q3	**ATTEMPT ANY THREE**	**21**
A	State the alpha-beta search algorithm	**7**
B	Explain temporal difference learning technique of passive reinforcement learning.	**7**
C	Explain active reinforcement learning. How Q-learning can be used to performed active reinforcement learning?	**7**
D	What are the issues related to policy search in reinforcement learning?	**7**

Q4	**ATTEMPT ANY THREE**	**12**
A	Distinguish between the following (At least 2 points in each) i. Fully and Partially observable task environments ii. Known vs. unknown task environments	**4**
B	Define well, the airline travel problem with a purpose to reach a destination.	**4**
C	What is "Nixon Diamond" problem?	**4**
D	What is reinforcement learning and what are the primary ways in which it can be achieved?	**4**

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12 JAN 2023

SVKM'S
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Course Name: Artificial Intelligence
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RE[illegible] EXAMINATION

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2) All questions are compulsory.
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7) Draw diagrams wherever suitable

Q1	**ATTEMPT ANY THREE**	**21**
A	What is an agent and agent function in AI?	7
B	Explain the working of a utility based agent.	7
C	What are admissible heuristics and relaxed problems and how relaxed problems can be used to generate admissible heuristics? Explain with an example.	7
D	Explain the Greedy-search strategy with an example.	7

Q2	**ATTEMPT ANY THREE**	**21**
A	State the backward chaining algorithm.	7
B	What is event calculus? What are the predicates for fluent in event calculus?	7
C	What are the different time-interval knowledge representations? How are interval and related functions stated in knowledge representation?	7
D	How circumscription is used to reason default information? Explain with an example.	7

Q3	**ATTEMPT ANY THREE**	**21**
A	State the minimax algorithm	**7**
B	Explain the working and equation of passive reinforcement learning.	**7**
C	How function approximation can be used in generalization in reinforcement learning?	**7**
D	What are the ways in which policy search is implemented in reinforcement learning?	**7**
Q4	**ATTEMPT ANY THREE**	**12**
A	Distinguish between the following (at least 2 points in each) i. Single agent vs. multiagent task environments ii. Static vs. dynamic task environments	**4**
B	Define well, the 8-puzzle problem where the goal is to have numbers/tiles in serial order row-wise.	**4**
C	What are the aspects of objects in knowledge representation?	**4**
D	What is reinforcement learning and what are its types?	**4**

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