⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)
B.Tech
SEM: IV - THEORY EXAMINATION (2023 - 2024)
Subject: Introduction to Artificial Intelligence

 Time: 3 Hours   **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

*1. This Question paper comprises of **three Sections -A, B, & C.** It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A   20

1. Attempt all parts:-

1-a.   What among the following is/are the example of the intelligent   1
         agent/agents?(CO1)

   (a)   Human

   (b)   Robot

   (c)   Autonomous Spacecraft

   (d)   All of the above

1-b.   A.M. turing developed a technique for determining whether a computer could or   1
         could not demonstrate the artificial Intelligence, Presently, this technique is
         called(CO1) _____

   (a)   Turing Test

   (b)   Algorithm

   (c)   Boolean Algebra

   (d)   Logarithm

1-c.   Alpha-beta pruning is a modified version of the? (CO2)   1

   (a)   minimin algorithm

   (b)   maximax algorithm

   (c)   minimax algorithm

   (d)   maximin algorithm

1-d.   Which of the following is/are Uninformed Search technique/techniques?(CO2)   1

   (a)   Breadth First Search (BFS)

   (b)   Depth-first search

   (c)   Bidirectional Search

   (d)   All of the mentioned

1-e. Which graph is used to represent semantic network? (CO3)   1

   (a)   Undirected graph

   (b)   Directed graph

   (c)   Directed Acyclic graph

   (d)   Directed complete graph

1-f. From which rule does the modus ponens are derived?(CO3)   1

   (a)   Inference rule

   (b)   Module rule

   (c)   Both Inference & Module rule

   (d)   None of the mentioned

1-g. Which of the following are Components of Expert Systems?(CO4)   1

   (a)   Knowledge Base

   (b)   Inference Engine

   (c)   User Interface

   (d)   All of the above

1-h. Backward chaining rule is?(CO4)   1

   (a)   Goal driven

   (b)   Data driven

   (c)   Both A and B

   (d)   None of these

1-i. What is Machine Learning (ML)?(CO5)   1

   (a)   The autonomous acquisition of knowledge through the use of manual programs

   (b)   The selective acquisition of knowledge through the use of computer programs

   (c)   The selective acquisition of knowledge through the use of manual programs

   (d)   The autonomous acquisition of knowledge through the use of computer programs

1-j. Reinforcement learning is-(CO5)   1

   (a)   Supervised

   (b)   Unsupervised

   (c)   Reward based

   (d)   None of the above

2. Attempt all parts:-

2.a.   What are Learning Agents?(CO1)   2

2.b.   Define the two-parameter used in alpha-beta pruning algorithm.(CO2)   2

2.c.	Explain the term Clauses in Propositional Logic.(CO3)	2
2.d.	Explain need of probabilistic reasoning in AI.(CO4)	2
2.e.	What are the requirements of Planning System?(CO5)	2

SECTION-B   30

3. Answer any <u>five</u> of the following:-

3-a.	What do you understand by Artificial intelligence? Where does AI morally stands in modern world?(CO1)	6
3-b.	Define Artificial Intelligence. Explain the behaviors of the AI. What do you mean by Turing Test? Explain it. (CO1)	6
3-c.	Explain the Minimax search with sutaible example.(CO2)	6
3-d.	What are the problems associated with Hill Climbing? How these can be overcomed?(CO2)	6
3.e.	What do you mean by Production System? Explain Water Jug Problem in detail.(CO3)	6
3.f.	With the help of diagram explain Expert system. Also, mention its constraints.(CO4)	6
3.g.	How conditional probability is related to dempster shafer theory?(CO5)	6

SECTION-C   50

4. Answer any <u>one</u> of the following:-

| 4-a. | "AI has a great impact on society". Justify the statement with real world examples.(CO1) | 10 |
| 4-b. | Compare and contrast uninformed search algorithms with heuristic search algorithms in terms of their exploration strategies, time and space complexity and complete solution.(CO1) | 10 |

5. Answer any <u>one</u> of the following:-

| 5-a. | What do you mean by Constraint Satisfaction? Solve the following CryptArithmetic Problem: SEND + MORE = MONEY. (CO2) | 10 |
| 5-b. | Explain Best First Search algorithms. Explain algorithm in detail with example.(CO2) | 10 |

6. Answer any <u>one</u> of the following:-

| 6-a. | Explain different approaches to Knowledge Representation in detail.(CO3) | 10 |
| 6-b. | Convert the following into well formed formulae using predicate Logic 1. Marcus was a man. | 10 |

2. Marcus was a Pompeian.

3. All Pompeians were Romans.

4. Caesar was a ruler.

5. All Romans were either loyal to Caesar or hated him. 6. Everyone is loyal to someone.

7. People only try to assassinate rulers they are not loyal to. 8. Marcus tried to assassinate Caesar.(CO3)

7. Answer any <u>one</u> of the following:-

| 7-a. | Define Hidden Markov model with appropriate example. State its drawbacks. (CO4) | 10 |

| 7-b. | Explain Forward Chaining and Backward Chaining with diagram. (CO4) | 10 |

8. Answer any <u>one</u> of the following:-

| 8-a. | Discuss the concept of Bayes networks and their use in probabilistic modelling. Provide examples of Bayes networks applied in various domains, such as medical diagnosis and risk assessment.(CO5) | 10 |

| 8-b. | How is Deep Learning better than Machine Learning? What are some of the most used applications of Deep Learning?(CO5) | 10 |