Printed Page:- 03 **Subject Code:- AMTAI0201**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech

SEM: II - THEORY EXAMINATION (2022-2023 **.)**

Subject: Machine Learning

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

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.*

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SECTION A **15**

1. Attempt all parts:-

1-a. In general, to have a well-defined learning problem, we must identity which of the following. [CO1] 1

(a) The class of tasks

(b) The measure of performance to be improved.

(c) The source of experience.

(d) All of the above

1-b. Instance based Learning algorithm is referred as _____algorithm. [CO2] 1

(a) Lazy Learning

(b) Grey Learning

(c) Q Learning

(d) Learning

1-c. How the compactness of the bayesian network can be described? [CO3] 1

(a) Locally structured

(b) Fully structured

(c) Partial structure

(d) All of the mentioned

1-d. What is the name of node which take binary values TRUE (T) and FALSE (F)? [CO4] 1

(a) Dual Node

(b) Binary Node

(c) Two-way Node

(d) Ordered Node

1-e. The algorithm operates by iteratively updating a pool of hypotheses, called the [CO5] 1

(a) Population

(b) Fitness

(c) None of these

(d) All of these

2. Attempt all parts:-

2.a. Define Decision Tree. [CO1] 2

2.b. What are the assumptions of linear regression?[CO2] 2

2.c. Define the terms hyperplane and support vector [CO3] 2

2.d. List out the commercial application of ANN. [CO4] 2

2.e. How to avoid overfitting. [CO5] 2

SECTION B **20**

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

3-a. What do you mean by a well–posed learning problem? Explain the important features that are required to well–define a learning problem. [CO1] 4

3-b. Describe in detail all the steps involved in designing a learning system. [CO1] 4

3-c. What type of problems are best suited for decision tree learning. [CO2] 4

3-d. Discuss Hypothesis Space Search in Decision tree Learning [CO2] 4

3.e. What are the types of problems in which Artificial Neural Network can be applied. [CO3] 4

3.f. What are the main differences between AI, Machine Learning, and Deep Learning? [CO4] 4

3.g. Discuss the nearest neighbour with a neat sketch. Also explain how to choose k in KNN. [CO5] 4

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SECTION C 35

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

4-a.	Discuss the different types of learning in machine learning and provide examples for each.[CO1]	7
4-b.	Trace the history of machine learning and highlight key milestones or breakthroughs.[CO1]	7

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

5-a.	What is inductive bias in decision tree learning and how does it impact the construction process?[CO2]	7
5-b.	Describe inductive inference with decision trees and the role of training data in this process.[CO2]	7

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

6-a.	What is regression in machine learning, and how is it applied in real-world scenarios?[CO3]	7
6-b.	What is inductive bias in decision tree learning, and how does it influence the construction of decision trees?[CO3]	7

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

7-a.	There are many machine learning algorithms till now. If given a data set, how can one determine which algorithm to be used for that? [CO4]	7
7-b.	Describe Artificial Neuron structure and how does it work? [CO4]	7

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

8-a.	Discuss the concept of Q learning and Q learning function with example [CO5]	7
8-b.	What is Genetic Algorithm and how does gene mutation works? [CO5]	7

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