Printed Page:- 04 **Subject Code**:- **ACSML0601**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (2022-2023)

Subject: Machine Learning

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 is the term known as on which the machine learning algorithms build a model based on sample data? (CO1) 1

(a) Data Training

(b) Training data

(c) Transfer data

(d) None of the above

1-b. .....is a widely used and effective machine learning algorithm based on the idea of bagging. (CO1) 1

(a) Regression

(b) Classification

(c) Decision Tree

(d) Random Forest

1-c. What is a dependent variable? (CO2) 1

(a) The value we want to predict

(b) The parameters of the regression algorithm

(c) The features of our dataset

(d) The values that interfere in the value we want to predict

1-d. The discrepancy between the numbers used to represent something that we are trying to measure and the actual value of what we are measuring is called: (CO2) 1

(a) Variance

(b) The 'fit' of the model

(c) Reliability

(d) Measurement error

1-e. Choose from the following that are Decision Tree nodes? (CO3) 1

(a) Decision Nodes

(b) End Nodes

(c) Chance Nodes

(d) All of the mentioned

1-f. Decision Tree is the most powerful for..... (CO3) 1

(a) Classification

(b) Prediction

(c) Classification & Prediction

(d) None of thses

1-g. Which is true for neural networks? (CO4) 1

(a) It has set of nodes and connections

(b) Each node computes it's weighted input

(c) Node could be in excited state or non-excited state

(d) All of the mentioned

1-h. Information from other neurons, in the form of electrical impulses, enters the dendrites at connection points called (CO4) 1

(a) Axions

(b) Synapse

(c) Dendrites

(d) Weights

1-i. _____ is an area of Machine Learning in which about taking suitable action to maximize reward in a particular situation. (CO5) 1

(a) Supervised learning

(b) unsupervised learning

(c) Reinforcement learning

(d) None of these

1-j. In_____ , output depends on the state of the current input and the next input depends on the output of the previous input. (CO5) 1

(a) Supervised learning

(b) unsupervised learning

(c) Reinforcement learning

(d) None of these

2. Attempt all parts:-

2.a. Describe 'Training data' and 'Testing data'. (CO1) 2

2.b. Explain Bias Variance Tradeoff? (CO2) 2

2.c. What is confusion matrix? (CO3) 2

2.d. What is a perceptron? Write the name of the different types of Perceptron. (CO4) 2

2.e. How Reinforcement Learning is different from Supervised learning? (CO5) 2

SECTION B **30**

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

3-a. Define Machine Learning. Discuss the importance of machine learning with examples. (CO1) 6

3-b. What are the various steps involved in designing a well posed learning system? (CO1) 6

3-c. How a Linear regression model is different from Logistic Regression? (CO2) 6

3-d. Explain Support Vector Machine algorithm with suitable example. (CO2) 6

3.e. Explain Entropy, Information gain and Gini Index used in building a Decision tree. (CO3) 6

3.f. State and Explain Bayes Theorem. (CO4) 6

3.g. Explain Q Learning algorithm in detail. (CO5) 6

SECTION C **50**

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

4-a. Demonstrate Find S algorithm for finding the most specific hypothesis based on given set of training data samples. (CO1) 10

Time	Weather	Temperature	Go for Walk	Humidity	Wind
Morning	Sunny	Warm	Yes	Mild	Strong
Evening	Rainy	Cold	No	Mild	Normal
Morning	Sunny	Moderate	Yes	Normal	Normal
Evening	Sunny	Cold	Yes	High	Strong

4-b. How Data Science is different from Machine Learning? (CO1) 10

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

5-a. Explain CART Algorithm for building decision tree. (CO2) 10

5-b. Explain Apriori Algorithm. Consider following dataset and write Association Rules for the same if minimum support is 2 and confidence is 50% (CO2) 10

T id	Item sets
T1	A,B
T2	B,D
T3	B,C
T4	A,B,D
T5	A,C
T6	B,C
T7	A,C
T8	A,B,C,E
T9	A,B,C

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

6-a. Differentiate between Agglomerative Clustering and DIANA. (CO3) 10

6-b. Explain K-nearest Neighbour learning Algorithm. Consider following dataset and find the value of ?. (CO4) 10

S. No	Maths	Computer	Result
1	4	3	Fail
2	6	7	Pass
3	7	8	Pass
4	5	5	Fail
5	8	8	Pass
6	6	8	?

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

7-a. Differentiate between Gradient Boosting and Random Forest. (CO4) 10

7-b. Explain Naive Bayes Classifier in detail with an example. (CO4) 10

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

8-a. What are the four key components of Reinforcement Learning? What kind of problems can be solved with reinforcement learning? (CO5) 10

8-b. Explain the steps involved in a typical Reinforcement Learning algorithm? (CO5) 10