Printed Page:- Subject Code:- ACSML0501

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech.

SEM: V - 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:-

1a Which of the following are common classes of problems in machine learning? (CO1) 1

(a) Regression

(b) Classification

(c) Clustering

(d) All of the above

1b Which of the following is a reinforcement learning application? (CO1) 1

(a) Topic modeling

(b) Recommendation system

(c) Pattern recognition

(d) Image classification

1-c. What is Regression? (CO2) 1

(a) It is a technique to predict values

(b) It is a technique to find outliers

(c) It is a technique to fix data

(d) It is a Machine Learning algorithm

1-d. A variable that measures the effect that manipulating another variable has is known as: (CO2) 1

(a) A dependent variable

(b) A confounding variable

(c) A predictor variable

(d) An independent variable

1-e. KNN is _____ algorithm. (CO3) 1

(a) Non-parametric and Lazy Learning

(b) Parametric and Lazy Learning

(c) Parametric and Eager Learning

(d) Non-parametric and Eager Learning

1-f. Movie Recommendation systems are an example of: (CO3) 1

1. Classification
2. Clustering
3. Reinforcement Learning
4. Regression

(a) 2 Only

(b) 1 and 2

(c) 2 and 3

(d) None of the mentioned

1-g. Spam Classification is an example for ? (CO4) 1

(a) Naive Bayes

(b) Probabilistic condition

(c) Random Forest

(d) All the above

1-h. Bayes rule can be used for (CO4) 1

(a) Solving queries

(b) Increasing complexity

(c) Answering probabilistic query

(d) Decreasing complexity

1 _____ is an area of Machine Learning in which about taking suitable action to maximize 1

reward in a particular situation. (CO5)

(a) Supervised learning

(b) unsupervised learning

(c) Reinforcement learning

(d) None of these

1	Which algorithm or process is used for RL system? (CO5)	1

(a) Hill-climbing search

(b) Markov model

(c) Depth-first search

(d) Breadth-first search

2. Attempt all parts:-

2.a.	Define the role of Machine Learning in our daily life. (CO1)	2
2.b.	Describe the libraries that are used to implement in Linear and Regression. (CO2)	2
2.c.	What is Clustring? (CO3)	2
2.d.	Explain the concept of Bayes theorem. (CO4)	2
2.e.	What is Q-Learning? (CO5)	2

SECTION B 30

3. Answer any five of the following:-

3	Explain The Candidate Elimination Algorithm with positive and negative examples. (CO1)	6
3	Explain the Linear regression and logistic regression with example. (CO1)	6
3-c.	Describe Supervised and Unsupervised Learning. (CO2)	6
3-d.	Define the term entropy, Information gain and Gini Index. (CO2)	6
3.e.	Discuss in detail about working of KNN classifier algorithm with suitable example.(CO3)	6
3.f.	What are the advantages and disadvantages of XGBoost ? (CO4)	6
3.g.	Explain the Markov decision process with suitable diagram. (CO5)	6

SECTION C 50

4. Answer any one of the following:-

4-a.	How is Candidate Elimination algorithm different from Find-S Algorithm. Explain in detail. (CO1)	10
4-b.	The cancer data set has 100 records, out of which 94 are cancer records and 6 are non-cancer records. but the model is predicting 90 out of 94 cancer records correctly. Four cancer	10

records are not predicted correctly [4-FN] and [TN-5]. Find the Precision, Recall, Accuracy.(CO1)

5. Answer any one of the following:-

5-a.	Implement SVM to plot hyperplane of the following points, (1,1), (2,1), (1,-1),(2,-1),(4,0),(5,1),(5,-1),(8,0). (CO2)	10
5-b.	What is CART. Elaborate with the suitable example. (CO2).	10

6. Answer any one of the following:-

6-a.	Explain the concept of density-based clustering. (CO3)	10
6-b.	Explain DIANA and AGNES with the help of examples. (CO3)	10

7. Answer any one of the following:-

7-a.	What are the different types of Naive Bayes classifiers? Explain in brief. (CO4)	10
7-b.	Explain the concept of the bagging and boosting ensemble method. (CO4)	10

8. Answer any one of the following:-

8-a.	What are the steps involved in a typical Reinforcement Learning algorithm? Explain. (CO5)	10
8-b.	Explain the Q function and Q Learning Algorithm assuming deterministic rewards and actions with examples. (CO5)	10