Printed Page:-03 **Subject Code:- ACSML0401**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: IV - THEORY EXAMINATION (2024- 2025)

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. Identify the kind of learning algorithm for "facial identities for facial expressions". (CO1,K1) 1

(a) Prediction
(b) Recognition Patterns
(c) Recognizing anomalies
(d) Generating patterns

1-b. Machine learning is a subset of which of the following.(CO1,K1) 1

(a) Artificial Intelligence
(b) Deep learning
(c) Data learning
(d) None of the above

1-c. What are Regression techniques? (CO2,K1) 1

(a) There are types of overfitting
(b) There are types of regression
(c) It is how you can classify a regression
(d) A regression must be Linear or Logistic

1-d. When is appropriate to use Logistic Regression? (CO2,K1) 1

(a) When the dependent variable is binary
(b) When the dependent variable is not binary

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(c) When the independent variables are binary

(d) When the independent variables are not binary

1-e. Select K Average test Error? (CO3,K1) 1

(a) Minimum

(b) Maximum

(c) Null

(d) None of these

1-f. End Nodes are represented by _____ (CO3,K1) 1

(a) Disks

(b) Squares

(c) Circles

(d) Triangles

1-g. Which of the following is not the promise of artificial neural network? (CO4,K1) 1

(a) It can explain result

(b) It can survive the failure of some nodes

(c) It has inherent parallelism

(d) It can handle noise

1-h. Select the correct definition of neuro software.(CO4,K1) 1

(a) It is software used by neurosurgeons

(b) It is software used by analyze neurons

(c) It is a powerful and easy neural network

(d) None of the above

1-i. _____ is an area of Machine Learning in which about taking suitable action to maximize reward in a particular situation. (CO5,K1) 1

(a) Supervised learning

(b) unsupervised learning

(c) Reinforcement learning

(d) None of these

1-j. Hidden Markov Model is used in-(CO5,K1) 1

(a) Supervised learning

(b) Unsupervised learning

(c) Reinforcement learning

(d) All of the above

2. Attempt all parts:-

2.a. Explain the issues in Machine Learning. (CO1,K1) 2

2.b. Explain what is the function of ‘Unsupervised Learning’?(CO2,K2) 2

2.c. Describe K-nearest Neighbour learning Algorithm (CO3,K1) 2

2.d. Explain The Bayes theorem.(CO4,K2) 2

2.e.	How is Machine Learning related to Artificial Intelligence?(CO5,K3)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Describe in brief: Version spaces and Candidate –Elimination Algorithm.(CO1,K2)	6
3-b.	Differentiate between Training data and Testing Data. (CO1,K4)	6
3-c.	Explain the Gradient Descent algorithm with respect to linear regression. (CO2,K2)	6
3-d.	State the importance of linear discriminant analysis over logistic regression. (CO2,K2)	6
3.e.	Explain Instance Based Learning With Examples.(CO3,K2)	6
3.f.	Discuss the Perceptron training rule.(CO4,K2)	6
3.g.	Discuss any 2 machine learning algorithms and their performance factors? (CO5,K2)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Describe in detail all the steps involved in designing a learning system. (CO1,K2)	10
4-b.	Define Candidate-Elimination algorithm and apply it by taking a small dataset to find the consistent hypothesis.(CO1,K3)	10

5. Answer any one of the following:-

5-a.	How to assess your supervised machine learning model? What's Recall and Precision?(CO2,K2)	10
5-b.	What are the benefits of linear regression? How Linear Regression is different from Logistic Regression? (CO2,K2)	10

6. Answer any one of the following:-

6-a.	Define the following terms with respect to K - Nearest Neighbour Learning - (CO3,K2) i) Regression ii) Residual iii) Kernel Function.	10
6-b.	Explain Bayesian belief network and conditional independence with example.(CO3,K2)	10

7. Answer any one of the following:-

7-a.	Explain Single layer and Multilayer feed forward networks. (CO4,K2)	10
7-b.	Derive the Backpropagation rule considering the training rule for Output Unit weights and Training Rule for Hidden Unit weights. (CO4,K2)	10

8. Answer any one of the following:-

8-a.	What are the steps involved in a typical Reinforcement Learning algorithm? Explain. (CO5,K2)	10
8-b.	Explain Q-Learning algorithm in detail(CO5,K2)	10