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-CARRY OVER THEORY EXAMINATION - AUGUST 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.*

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SECTION A **20**

1. Attempt all parts:-

1-a. Identify the type of learning in which labeled training data is used. (CO1) 1

(a) Semi Supervised learning

(b) Supervised Learning

(c) Reinforcement Learning

(d) Unsupervised Learnng

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

(a) Artificial Intelligence

(b) Deep learning

(c) Data learning

(d) None of the above

1-c. Which of the following statement is true about outliers in Linear regression? (CO2) 1

(a) Linear regression is sensitive to outliers

(b) Linear regression is not sensitive to outliers

(c) Can't say

(d) None of these

1-d. The Euclidean distance between two a set of numerical attributes is called as? (CO2) 1

(a) Closeness

(b) Validation Data

(c) Error Rate

(d) None of these

1-e. Which of the following option is true about k-NN algorithm? (CO3) 1

(a) it can be used for classification

(b) it can be used for regression

(c) it can be used in both classification and regression

(d) not useful in ml algorithm

1-f. A _____ is a decision support tool that uses a tree-like graph or model of decisions and their possible consequences, including chance event outcomes, resource costs, and utility. (CO3) 1

(a) Decision tree

(b) Graphs

(c) Trees

(d) Neural Networks

1-g. A perceptron is: (CO4) 1

(a) a single layer feed-forward neural network with pre-processing

(b) an auto-associative neural network

(c) a double layer auto-associative neural network

(d) a neural network that contains feedback

1-h. Which of the following is not Biological Neurons? (CO4) 1

(a) Axions

(b) Dendrites

(c) Synapse

(d) Weights

1-i. Which algorithm is used in robotics and industrial automation? (CO5) 1

(a) Thompson sampling

(b) Naive Bayes

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(c) Decision tree

(d) All of the above

1-j. Which algorithm is used for solving temporal probabilistic reasoning? (CO5) 1

(a) Hill-climbing search

(b) Hidden markov model

(c) Depth-first search

(d) Breadth-first search

2. Attempt all parts:-

2.a. What is the main key difference between supervised and unsupervised machine learning? (CO1) 2

2.b. What is Multilayer Perceptron? (CO2) 2

2.c. Describe Decision Tree with example. (CO3) 2

2.d. List down the names of some popular Activation Functions used in Neural Networks. (CO4) 2

2.e. Explain Reinforcement Learning in context with Healthcare. (CO5) 2

SECTION B **30**

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

3-a. Explain the steps involved in Candidate Elimination Algorithm. (CO1) 6

3-b. Explain well posed learning system with example. (CO1) 6

3-c. What do you mean by Regression ? Explain with example. (CO2) 6

3-d. What is Association Rule Learning? Explain Market Basket Analysis. (CO2) 6

3.e. How K means algorithm is different from k mode algorithm ? (CO3) 6

3.f. Draw the model of a single artificial neuron and derive its output. (CO4) 6

3.g. Explain the uses and applications of Deep Learning. (CO5) 6

SECTION C **50**

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

4-a. What is 'training Set' and 'test Set' in a Machine Learning Model? How Much Data Will You Allocate for Your Training, Validation, and Test Sets? (CO1) 10

4-b. What are the basic design issues and approaches to machine learning? (CO1) 10

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

5-a. Demonstrate Find S algorithm for finding the most specific hypothesis based on given set of training data samples. (CO2) 10

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Example	Sky	AirTemp	Humidity	Wind	Water	Forecast	EnjoySport
1	Sunny	Warm	Normal	Strong	Warm	Same	**YES**
2	Sunny	Warm	High	Strong	Warm	Same	**YES**
3	Rainy	Cold	High	Strong	Warm	Change	**NO**
4	Sunny	Warm	High	Strong	Warm	Change	**YES**

5-b. Compare regression, classification and clustering in machine learning along with suitable real life examples.(CO2) 10

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

6-a. What is Hierarchical Clustering? Explain various types of Hierarchical Clustering. (CO3) 10

6-b. Explain K means Clustering. Find the final clusters that will be made from the following dataset, assume A2 (2,6), A7 (5,10) and A15 (6,11) as the centroids of the initial cluster: (CO3) 10

Point	Coordinates
A1	(2,10)
A2	(2,6)
A3	(11,11)
A4	(6,9)
A5	(6,4)
A6	(1,2)
A7	(5,10)
A8	(4,9)
A9	(10,12)
A10	(7,5)
A11	(9,11)
A12	(4,6)
A13	(3,10)
A14	(3,8)
A15	(6,11)

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

7-a. Explain the concept of Bagging and Boosting in detail. (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. How are uncertainty and constraints taken into account in Reinforcement Learning? (CO5) 10

8-b. What is the role of Markov Decision Process in reinforcement learning? (CO5) 10