Roll No. : .....

Galgotias College of Engineering and Technology, Greater Noida

Pre University Test (PUT): Odd Semester 2024 - 25

Course/Branch	: B.Tech/ME	Semester	: 7th
Subject Name	: Machine Learning	Max. Marks	: 100
Subject Code	: KME-074	Time	: 180 min

CO-1 : Understand machine learning concepts
CO-2 : Apply machine learning algorithms
CO-3 : Solve prediction based problems
CO-4 : Analyze machine learning algorithms
CO-5 : Solve real-world machine learning problems

Section – A

Attempt **ALL** the questions. (10 x 2 = 20 marks)

Q. No.		COx	Question Description
1	a	CO1	Define the big data & its role in Machine learning. (K1).
	b	CO1	Define Machine learning and its application. (K1).
	c	CO2	Differentiate between Training data and Testing Data. (K1).
	d	CO2	Discuss the meaning of data mining. (K2).
	e	CO3	Describe the artificial intelligence (AI). (K1).
	f	CO3	Define the learning classifiers. (K2).
	g	CO4	Describe the Artificial Neural Networks (ANN). (K1).
	h	CO4	Discuss the weight and bias in ANN. (K2).
	i	CO5	What is the difference between reinforcement learning and Artificial Intelligence? (K2).
	j	CO5	What is meaning of Chromosome in genetic algorithm. (K1).

Section – B

Attempt **ALL** the questions. (5 x 6 = 30 marks)

Q.2 (CO-1): Define the machine learning and its application in Mechanical Engineering. (K2)

OR

What are the key steps involved in building and deploying a machine learning model? (K3)

Q.3 (CO-2): Define the regression analysis and its types. explain in brief with suitable example. (K2)

OR

How do cross-validation methods help in assessing the balance between bias and variance in a model? (K3)

Q.4 (CO-3) : What is Cluster Analysis in unsupervised learning? (K3)

OR

What are the main steps of the Expectation-Maximization Algorithm, and how do they iteratively improve the solution? (K2)

Q.5 (CO-4): Define the terms in decision trees, explain (i) Entropy, (ii) Information Gain. (K2)

OR

Explain the difference between Gini Index and Information Gain in evaluating decision tree splits. (K2)

Q.6 (CO-5): Discuss the steps of Genetic algorithm (GA.) with a suitable example. (K2)

OR

Discuss the limitations of Genetic Algorithms. How can they be mitigated in practical applications? (K1)

Section – C

Attempt **ALL** the questions. (5 x 10 = 50 marks)

Q.7 (CO-1) : Attempt any ONE question.

(a) How machine learning works with Netflix, Facebook, and amazon websites. (K2)

(b) Differentiate between Supervised, Unsupervised and Reinforcement machine Learning. explain with suitable examples. (K1)

Q.8 (CO-2): Attempt any ONE question.

(a) Define the Bayesian Decision theory with suitable example. (K2)

(b) How the Supervised learning works in Customer discovery in retail shopping? Write the steps. (K3)

Q.9 (CO-3): Attempt any ONE question.

(a) Use the Nearest Neighbor clustering algorithm and Euclidean distance to cluster the examples from the previous exercise: A1=(2,10), A2=(2,5), A3=(8,4), A4=(5,8), A5=(7,5), A6=(6,4), A7=(1,2), A8=(4,9). Suppose that the threshold 't' is 4. (K2)

(b) Draw the cluster of following 8 points into 3 clusters: A1= (10,7), A2=(8,6), A3=(9,4), A4=(5,8), A5=(7,5), A6=(7,4), A7=(3,2), A8=(4,9). Use the k-means algorithm and Euclidean distance and take the Initial cluster centers are A2(8, 6), A4(5, 8) & A8 (4,9). The solution up to two iterations. (K3)

Q.10 (CO-4): Attempt any ONE question.

(a) Explain Backpropagation algorithm in artificial neural network (ANN) with suitable example. (K2)

(b) Explore the concept of Convolutional Neural Networks (CNNs) and the different types of layers in CNN architecture. (K3)

Q.11 (CO-5): Attempt any ONE question.

(a) What are the applications of Genetic Algorithm in real world? Write in brief. (K2)

(b) Define the reinforcement learning & discuss its applications. (K2)