

Galgotias College of Engineering and Technology, Greater Noida

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

Subject Name Course/Branch Machine Learning B.Tech/ME

Subject Code : KME-074

> Time Max. Marks Semester.

: 100 : 180 min

CO-1 : Understand machine learning concepts CO-2 : Apply machine learning algorithms

CO-4 : Analyze machine learning algorithms CO-3 : Solve prediction based problems

CO-5 : Solve real-world machine learning problems

Attempt ALL the questions

Section - A

(10 x 2 = 20 marks)

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Section - B

Attempt ALL the questions,

 $(5 \times 6 = 30 \text{ marks})$

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)

Flow 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)

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)

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)

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

Section - C

Attempt ALL the questions

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

 $(5 \times 10 = 50 \text{ marks})$

(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.

- the previous exercise: A1=(2,10), A2=(2,5), A3=(8,4), A4=(5,8), A5=(7,5), A6=(6,4), A7=(1,2)(a) Use the Nearest Neighbor clustering algorithm and Euclidean distance to cluster the examples from A8=(4,9). Suppose that the threshold 't' is 4. (K2)
- (b) Draw the cluster of following 8 points into 3 clusters: AI = (10,7), A2 = (8,6), A3 = (9,4), A4 = (5,8)
- the Initial cluster centers are A2(8, 6), A4(5, 8) & A8 (4,9). The solution up to two iterations. (K3) A5=(7.5), A6=(7.4), A7=(3.2), A8=(4.9). Use the k-means algorithm and Euclidean distance and take

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

- (a) Explain Backpropagation algorithm in artificial neural network (ANN) with suitable example. (K2)
- CNN architecture. (K3) (b) Explore the concept of Convolutional Neural Networks (CNNs) and the different types of layers in

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)