BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – M.Tech.(CSE)-AIML-2024
Course Name – Machine Learning
Course Code - MTA20109
(Semester II)

Full Marks : 60   **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question)   1 x 15=15

1.   *Choose the correct alternative from the following :*

(i)   Select the one that is NOT a type of Machine Learning

a) Supervised Learning   b) Unsupervised Learning
c) Reinforcement Learning   d) Deterministic Learning

(ii) write the primary objective of regres+A2:C21sion analysis

a) To classify data   b) To predict continuous values
c) To reduce dimensionality   d) To cluster data

(iii) The cost function in linear regression measure _____

a) Difference between predicted and actual   b) Total number of iterations
   values
c) Learning rate   d) Feature importance

(iv) What does the learning rate determine in gradient descent?

a) The number of iterations   b) Question
c) The type of cost function   d) The degree of the polynomial

(v)   Select the learning type that uses rewards and punishments

a) Reinforcement Learning   b) Supervised Learning
c) Unsupervised Learning   d) Semi-supervised Learning

(vi) Principal Component Analysis (PCA) used for _____

a) Classification   b) Regression
c) Clustering   d) Dimensionality reduction

(vii) Select the main idea behind the K-Nearest Neighbors (KNN) algorithm.

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a) To find the optimal hyperplane

b) To classify a data point based on its nearest neighbors

c) To create clusters of data points

d) To predict future values based on past trends

(viii) Select among the following that is a disadvantage of the KNN algorithm

a) It is computationally efficient

b) It is easy to interpret

c) It can be sensitive to irrelevant features

d) It works well with large datasets

(ix) Select the correct use of Decision Tree

a) Only classification

b) Only regression

c) Both classification and regression

d) Dimensionality reduction

(x) The model learns the training data too well, including noise is called

a) Overfitting

b) Underfitting

c) Supervised learning

d) KNN

(xi) Explain the objective function in K-Means clustering

a) To maximize the distance between clusters

b) To minimize the distance between data points and their centroids

c) To find the optimal number of clusters

d) To maximize the similarity within clusters

(xii) An Algorithm that is a popular technique for Association Rule Learning is

a) K-Means

b) Apriori

c) PCA

d) SVM

(xiii) Explain a key difference between K-Means and Hierarchical Clustering

a) K-Means is deterministic, Hierarchical is not

b) K-Means requires pre-defining the number of clusters, Hierarchical doesn't

c) K-Means is used for small datasets, Hierarchical for large

d) K-Means is more robust to outliers than Hierarchical

(xiv) Explain role that dendrites play in biological neurons.

a) Transmit signals

b) Process sensory inputs

c) Control motor functions

d) Send output signals

(xv) Predict the name of the layer in a neural network extracts features from input data

a) Input layer

b) Hidden layer

c) Output layer

d) Fully connected layer

Group-B
(Short Answer Type Questions)   3 x 5=15

2. Differentiate between Linear and Non-Linear data with examples.   (3)
3. Define Supervised Learning and provide two examples.   (3)
4. Explain the advantages of feature selection   (3)
5. Explain the Apriori Algorithm   (3)
6. Evaluate the structure of an artificial neuron.   (3)

OR

Compare the role of different layers in a deep neural network   (3)

Group-C
(Long Answer Type Questions)   5 x 6=30

7. Differentiate between Hierarchical and Density-Based Clustering   (5)
8. Explain Bagging/ Bootstrap Aggregation ensemble learning   (5)

9. Explain CART decision tree (5)
10. Predict the equation polynomial regression and state it's applications (5)
11. Describe Confusion Matrix, and why is it important. (5)
12. Summarize the role of dendrites, axons, and synapses in neural networks (5)

OR

Summarize different layers in a neural network (5)

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