



BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – B.Tech.(RA)-2021
Course Name – Machine Learning
Course Code - OEC-ECR601A
(Semester VI)

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) Choose from the following that Machine Learning defines

a) A technique to make machines sentient

b) A field of study that gives computers the ability to learn without being explicitly programmed

c) A way to program computers to follow specific instructions

d) A method for optimizing algorithms

(ii) Indicate the type of data can be represented by a straight line in a scatter plot.

a) Linear data

b) Non-linear data

c) Categorical data

d) Ordinal data

(iii) Select the type of machine learning that requires labeled data for training.

a) Supervised learning

b) Unsupervised learning

c) Reinforcement learning

d) Semi-supervised learning

(iv) Identify the primary goal of model selection in machine learning

a) To choose the most complex model

b) To overfit the data

c) To find the simplest model that fits the data well

d) To use all available data for training

(v) Select that type of regularization technique that can force some of the coefficients to be exactly zero.

a) L1 regularization

b) L2 regularization

c) Elastic Net

d) Ridge regression

(vi) Indicate that polynomial regression involved

a) Fitting a linear equation to the data

b) Fitting a curve to the data using higher-degree polynomials

c) Reducing the number of features

d) Adding regularization terms to the cost function

(vii) In polynomial regression, the high value of degree of the polynomial infers

- a) The model is underfitting
c) The model is unbiased
- b) The model is overfitting
d) The model is consistent
- (viii) Choose the regularization technique that simultaneously performs variable selection and regularization.
- a) Ridge regression
c) Elastic Net
- b) LASSO regression
d) Principal Component Analysis (PCA)
- (ix) In supervised learning, select the main objective.
- a) Minimize the prediction error
c) Classify unlabeled data
- b) Maximize the reward function
d) Learn from labeled data to make predictions
- (x) Tell SVM stands for machine learning.
- a) Supervised Vector Machine
c) Standard Vector Machine
- b) Support Vector Machine
d) Sequential Vector Machine
- (xi) What distinguishes linear SVM from non-linear SVM?
- a) Linear SVM uses a linear kernel, while non-linear SVM uses a non-linear kernel
c) Linear SVM has a higher computational complexity than non-linear SVM
- b) Linear SVM is suitable only for binary classification, while non-linear SVM can handle multiclass problems.
d) Linear SVM doesn't use support vectors, while non-linear SVM relies heavily on them
- (xii) Choose from the following that KNN stands for in machine learning.
- a) Kernel Nearest Neighbors
c) K-Nearest Neighbors
- b) K-Means Nearest Neighbors
d) Kernels and Neurons Network
- (xiii) Choose from the following that CART stand for in Decision Tree classifiers.
- a) Classifying Algorithm for Regression Trees
c) Cluster Analysis and Regression Technique
- b) Classification and Regression Tree
d) Conditional Automated Regression Tree
- (xiv) Select the main characteristic of Unsupervised Learning.
- a) It requires labelled data for training
c) It only works with numerical data
- b) It discovers patterns in data without labelled output
d) It focuses on regression tasks
- (xv) Choose the type of learning that is an example of K-Means Clustering
- a) Supervised Learning
c) Unsupervised Learning
- b) Reinforcement Learning
d) Semi-supervised Learning

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Describe machine learning in brief. (3)
3. Define Hierarchical Clustering and tell its need. (3)
4. Explain gradient descent in the context of linear regression. (3)
5. Explain the concepts of Feedforward and Feedback Connections in ANNs and their respective roles in information flow. (3)
6. Analyze hypothesis function in linear regression. (3)

OR

Compare univariate and multivariate linear regression.

(3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Explain the types of Association Rule Learning algorithms: Apriori, Eclat, and FP-Growth. (5)
8. Distinguish between overfitting and underfitting. (5)
9. Discuss feature selection technique of machine learning. (5)
10. Explain the concept of Pruning in Decision Trees and its purpose. (5)
11. Illustrate detailed examples of applications of Reinforcement Learning (RL). (5)
12. Explain how the Elbow method helps in improving the performance of K-Means clustering. (5)

OR

Illustrate the advantages of K-Means clustering.

(5)
