22SSP641

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc (SS) DEGREE EXAMINATION DECEMBER 2025
(Sixth Semester)

Branch – **SOFTWARE SYSTEMS (Five Years Integrated)**

MACHINE LEARNING

Time: Three Hours | Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1 Which of the following is NOT a type of machine learning?
(i) Supervised learning (ii) Unsupervised learning
(iii) Reinforcement learning (iv) Random learning

2 In a linear regression model, what does the coefficient represent?
(i) The slope of the line (ii)The intercept
(iii)The loss function (iv)The distance between points

3 Which classification algorithm is based on the Bayes Theorem?
(i) Decision Tree (ii)KNN
(iii) Naïve Bayes (iv) Random Forest

4 Which deep learning model is primarily used for image classification?
(i) RNN (ii) CNN
(iii)KNN (iv) Decision Tree

5 Which of the following is a popular dimensionality reduction technique?
(i) PCA (ii) K-Means Clustering
(iii)Decision Tree (iv) SVM

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a What are the advantages and disadvantages of Machine Learning?
OR
b What is the difference between classification and regression problems in Machine Learning?

7 a Differentiate between binary classification and multi-class classification.
OR
b What is classification in Machine Learning? Explain with an example.

8 a What are the advantages of using multi-layer perceptrons (MLPs)?
OR
b Explain the basic concept of the Bayesian classifier and its working principle.

9 a Explain how Decision Trees can be used for regression tasks with an example.
OR
b Explain the diagonal line in a ROC curve. What does it signify?

10 a Describe the concept of spectral clustering with an example.
OR
b What are some applications of unsupervised learning in real-world scenarios?

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11 a Discuss the importance of data preprocessing in Machine Learning.

OR

b Explain the concept of overfitting and underfitting with examples.

12 a Explain the concept of decision boundaries in classification.

OR

b Write a short note on Support Vector Machines (SVM) for classification.

13 a Explain the architecture of a neural network with a simple diagram.

OR

b What is back propagation? Why is it important in training neural networks?

14 a Explain how the ID3 algorithm builds a Decision Tree.

OR

b Explain the process of pruning and its two types: pre-pruning and post-pruning.

15 a Explain how the elbow method is used to determine the optimal number of clusters in K-means.

OR

b What is PCA? How is it used in dimensionality reduction?

Z-Z-Z END