22SSP641

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

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

Branch – **SOFTWARE SYSTEMS (Five Year 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 What is the Gaussian distribution also known as?
(i) Uniform distribution (ii) Poisson distribution
(iii) Normal distribution (iv) Exponential distribution

2 Which of the following is an example of unsupervised learning?
(i) Image classification (ii) Customer segmentation
(iii) Spam email detection (iv) Sentiment analysis

3 Which algorithm is commonly used for regression problems?
(i) Decision Trees (ii) K-Means
(iii) Apriori Algorithm (iv) Linear Regression

4 Which of the following algorithms is NOT used for classification?
(i) Naïve Bayes (ii) K-Nearest Neighbors
(iii) Support Vector Machine (iv) K-Means Clustering

5 What is the basic building block of a neural network?
(i) Neuron (ii) Pixel
(iii) Cluster (iv) Node

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

6 a Describe the importance of data preprocessing in Machine Learning.

OR

b Compare the difference between classification and regression problems in Machine Learning.

7 a Explain Logistic Regression. Discuss its significance in classification tasks.

OR

b State the linear regression in classification.

8 a Outline the k-Nearest Neighbors (k-NN) algorithm and how it can be used for classification.

OR

b Explain the concept of neural networks.

Cont...

9 a. Explain how bootstrapping is performed with an example.

OR

b. Discuss how you can interpret the performance of a model based on its AUC score.

10 a. What are clustering and dimensionality reduction in the context of unsupervised learning?

OR

b. Compare the performance of ICA with PCA for image processing tasks.

SECTION -C (30 Marks)

Answer **ALL** questions

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

11 a Define Machine Learning and explain its types.

OR

b What is the difference between supervised and unsupervised learning?

12 a Describe the components of the confusion matrix and their relevance in evaluating classification models.

OR

b Justify Logistic Regression. Discuss its significance in classification tasks.

13 a Discuss the role of Bayesian classifier.

OR

b Examine the significance of the decision theory.

14 a Discuss the advantages and disadvantages of Decision Trees.

OR

b Identify the difference between a classification tree and a regression tree.

15 a Describe the steps involved in performing ICA.

OR

b State the key assumptions of the Mixture of Gaussians model.

Z-Z-Z END