MCQ:

What is the primary goal of machine learning?
a) Mimic human intelligence
b) Automate routine tasks
c) Learn from data and make predictions
d) Generate random outputs

Which of the following is a type of supervised learning algorithm?
a) K-Means Clustering
b) Decision Tree
c) Apriori Algorithm
d) PCA (Principal Component Analysis)

What does the term "feature" refer to in machine learning?
a) The target variable
b) Input variables or attributes
c) The prediction output
d) The learning rate

Which algorithm is used for image recognition tasks?
a) K-Nearest Neighbors (KNN)
b) Naive Bayes
c) Convolutional Neural Network (CNN)
d) Support Vector Machine (SVM)

In machine learning, what is cross-validation used for?
a) Evaluating model performance
b) Feature engineering
c) Hyperparameter tuning
d) Data preprocessing

What is the purpose of the activation function in a neural network?
a) Normalize input data
b) Introduce non-linearity
c) Compute loss function
d) Regularize the network

Which type of learning algorithm does not require labeled training data?
a) Unsupervised learning
b) Supervised learning
c) Semi-supervised learning
d) Reinforcement learning

What is the curse of dimensionality in machine learning?
a) Overfitting on the training data
b) High-dimensional data leading to increased computational complexity
c) Insufficient features in the dataset
d) Lack of diversity in the data

Which evaluation metric is suitable for regression problems?
a) Precision
b) Recall
c) Mean Squared Error (MSE)
d) F1 Score

What is the purpose of the training set in machine learning?
a) To test the model's performance

b) To fine-tune hyperparameters
c) To train the model's parameters
d) To validate the model's predictions

Which algorithm is commonly used for natural language processing tasks, such as text classif
a) K-Means Clustering
b) Random Forest
c) Long Short-Term Memory (LSTM)
d) Apriori Algorithm

What is the purpose of regularization in machine learning?
a) Increase model complexity
b) Reduce model complexity and prevent overfitting
c) Speed up training process
d) Normalize input data

What does the term "bias" refer to in machine learning?
a) Error on the training data
b) High model complexity
c) Error on the test data
d) Systematic error introduced by approximations

Which of the following is a hyperparameter for the Support Vector Machine (SVM) algorithm?
a) Learning rate
b) Number of neighbors (K)
c) Kernel type
d) Number of clusters (K)

What is the purpose of the confusion matrix in classification problems?
a) Evaluate model performance
b) Visualize data distribution
c) Determine feature importance
d) Adjust learning rate

5 Marks question
Compare Artificial Intelligence vs. Machine Learning
Give advantages and disadvantages of KNN
Describe the process of feature engineering in machine learning.
Explain the concept of overfitting in machine learning.
How does reinforcement learning differ from supervised and unsupervised learning?
Give mathematical expressions for different activation functions used in machine learning.
Explain the k-Means Algorithm with an example
Give advantages and disadvantages of Naive Bayes learning algorithm.

15 Marks question
1.
a)■What are training and test data.
b)■Write the Bayes theorem and write the significance of the theorem.
c)■Write the differences between Linear and Logistic regression.
2.■a)■Write the differences between Classification and Regression.
b)■Discuss the steps for building the decision tree.
3.■a)■What is ensemble modeling.
b)■Explain recurrent networks
c)■Explain the concept of a Perceptron with a neat diagram.
4. ■Write short note on any three
a)■ANN
b)■Deep Learning
c)■Hierarchical Agglomerative Clustering
d)■Principal Component Analysis (PCA)
e)■Multilayer networks and backpropagation