

Artificial Intelligence and Machine Learning Question Bank:

Unit-III

1. What are the primary categories learning of machine learning? Provide brief examples of each. (5 marks)
2. Highlight the characteristics and requirements of machine learning. (5 marks)
3. Explain the application of machine learning. (10 marks)
4. Describe the key stages in the machine learning life cycle, emphasizing the importance of data preprocessing and model deployment. Highlight challenges associated with each stage and propose strategies for effective management. (10 marks)
5. Identify and elaborate on the core distinctions between Artificial Intelligence and Machine Learning. (5 marks)
6. Discuss the consequences of the bias-variance tradeoff on model performance. How can this tradeoff be managed in practical scenarios? (10 marks)
7. How do overfitting and underfitting impact the generalization ability of a machine learning model? Provide strategies to address these issues. (10 marks)
8. Compare and contrast different model evaluation metrics commonly used in machine learning. Highlight situations where precision, recall, and F1-score might be more appropriate. (10 marks)
9. Examine the differences between linear regression and logistic regression. In what types of problems is one more suitable than the other? (10 marks)
10. Elaborate on the assumptions underlying the Naïve Bayes Classifier. How do these assumptions simplify the modeling process? (10 marks)
11. How does Bayes' theorem contribute to the foundation of Bayesian learning? Provide a real-world scenario where Bayesian learning can be advantageous. (10 marks)
12. Elaborate on the assumptions underlying the Naïve Bayes Classifier. How do these assumptions simplify the modeling process? (10 marks)
13. In the context of model evaluation, explain the concept of precision-recall tradeoff. How can it be managed to optimize model performance? (10 marks)
14. Illustrate the application of the Naïve Bayes Classifier in a real-world scenario. Highlight the classifier's strengths and potential limitations. (10 marks)
15. Problem 1: Accuracy: Suppose you have a dataset with 1000 samples, and a classification model correctly predicts 900 samples as "Class A" and 80 samples as "Class B." Calculate the accuracy of the model.
16. Confusion Matrix Problem: Given a confusion matrix below for a binary classification problem, calculate precision, recall, and F-Score.
17. AUC-ROC Problem: For a binary classification model, the ROC curve is plotted, and the area under the curve (AUC) is found to be 0.85. Interpret the AUC-ROC value.
18. Handling Imbalanced Classes Problem: You have a dataset with 900 samples of Class A and only 100 samples of Class B. If a classification model predicts all samples as Class A, what will be the accuracy, precision, recall, and F-Score?
19. Confusion Matrix Problem: Given a confusion matrix below for a binary classification problem, calculate precision, recall, and F-Score.

n=165	Predicted: NO	Predicted: YES
Actual: NO	50	10
Actual: YES	5	100