Machine Learning: 10 Questions (10 Marks Each)

1. Introduction to Machine Learning

   (a) Define machine learning and explain its scope. (5 marks)

   (b) Discuss two real-world applications of machine learning. (5 marks)

2. Supervised Learning

   (a) Explain the difference between regression and classification problems. (4 marks)

   (b) Describe the working of linear regression with an example. (6 marks)

3. Unsupervised Learning

   (a) Define clustering and explain its importance. (4 marks)

   (b) Compare K-Means clustering with Hierarchical clustering. (6 marks)

4. Neural Networks and Deep Learning

   (a) Explain the architecture of a feedforward neural network. (5 marks)

   (b) Discuss the significance of activation functions in neural networks. (5 marks)

5. Convolutional Neural Networks (CNNs)

   (a) What is a Convolutional Neural Network? Explain its structure. (5 marks)

   (b) Describe two applications of CNNs in image processing. (5 marks)

6. Model Evaluation and Optimization

   (a) Define overfitting and underfitting in machine learning models. (4 marks)

   (b) Explain the role of cross-validation in model optimization. (6 marks)

7. Reinforcement Learning

   (a) Define Markov Decision Processes (MDPs). (4 marks)

   (b) Explain the difference between Q-learning and policy gradient methods. (6 marks)

8. Dimensionality Reduction

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(a) What is Principal Component Analysis (PCA)? (4 marks)

(b) Discuss the importance of dimensionality reduction in machine learning. (6 marks)

9. Advanced Topics

(a) What are Generative Adversarial Networks (GANs)? (5 marks)

(b) Explain how recommendation systems work in machine learning. (5 marks)

10. Tools and Frameworks

(a) List and describe two Python libraries commonly used in machine learning. (5 marks)

(b) Compare TensorFlow and PyTorch as deep learning frameworks. (5 marks)