1. What is CNN.?
2. What is the role of hyperparameters in a machine learning algorithm?

   What is the primary difference between supervised and unsupervised learning algorithms?
3. What is the difference between bias and variance
4. What are the challenges that motivate the development of deep learning models?
5 What is regularization in deep learning?
6 How does early stopping help in training deep models?
7 Explain the concept of dropout in deep learning.
8 What is multi-task learning in deep learning?
9 What is overfitting?
10 What is bagging in ensemble methods?
11 Explain the difference between capacity and model complexity in machine learning.
13 Why is a validation set important in machine learning?
14 What is adversarial training in the context of neural networks?
15 What are parameter norm penalties?
16 How does early stopping help in training deep models?
17 What is learning and pure optimization.
18 What are hidden units?
19 What is kernel?
20 What does it mean for convolution to act as an infinitely strong prior in CNNs?

**Long Answer Question**

21 Describe Maximum Likelihood Estimation (MLE) and Bayesian statistics in the context of machine learning.
22 Provide an overview of stochastic gradient descent (SGD) as an optimization method in machine learning. Discuss its advantages over traditional gradient descent.

23 Explain the differences between supervised, unsupervised, and semi-supervised learning, with examples of each.

24 Discuss how parameter norm penalties function as a regularization

25 Explain the convolution operation in Convolutional Neural Networks

26 What are the key motivations behind using Convolutional Neural Networks over traditional fully connected networks?

27 Explain the concepts of overfitting and underfitting in machine learning. What are some ways to avoid these problems?

28 Describe the back-propagation algorithm and its role in training deep feedforward networks.

30 Discuss how parameter norm penalties function as a regularization

31 Explain the concept of regularization in deep learning and how it helps prevent overfitting.

32 Describe the convolutional operation in CNNs with example.

33 Explain Following terms

1. Bias and Variance
2. Gradient Descent
3. Hyperparameter and Model Parameter
4. Flatten
5. Learning rate

34 Explain how semi-supervised learning can act as a regularization

35 What are sparse representations, and why are they useful in deep learning

36 Compare bagging and boosting .

37 Explain AdaGrad algorithm in detail.

38 Explain RMSProp algorithm in detail.

39 Explain Learning algorithm in detail.

40 Explain Deep Feedforward Networks general architecture with diagram