1. What does one mean by the term "machine learning"?

ANS Machine learning is a subfield of artificial intelligence, which is broadly defined as the capability of a machine to imitate intelligent human behavior. Artificial intelligence systems are used to perform complex tasks in a way that is similar to how humans solve problems.

2.Can you think of 4 distinct types of issues where it shines?

ANS spam detection in email, cancer diagnosis, fraudulent credit card transactions, and automatically driving vehicles

3.What is a labeled training set, and how does it work?

ANS The training set is used to train the algorithm, and then you use the trained model on the test set to predict the response variable values that are already known.

4.What are the two most important tasks that are supervised?

ANS The two most common supervised tasks are regression and classification

5.Can you think of four examples of unsupervised tasks?

ANS clustering, association, and dimensionality reduction

6.State the machine learning model that would be best to make a robot walk through various unfamiliar terrains?

ANS. Reinforced Learning, where the robot can learn from response of the terrain to optimize itself.

7.Which algorithm will you use to divide your customers into different groups?

ANS k-means clustering algorithm

8.Will you consider the problem of spam detection to be a supervised or unsupervised learning problem?

ANS. supervised machine learning problem

9.What is the concept of an online learning system?

ANS online machine learning is a method of machine learning in which data becomes available in a sequential order and is used to update the best predictor for future data at each step

10.What is out-of-core learning, and how does it differ from core learning?

Ans It is a way to train your model on data that cannot fit your core memory.” Out-of-core learning refers to the machine learning algorithms working with data that cannot fit into a single machine's memory but can easily fit into some data storage, such as a local hard disk or web repository

11.What kind of learning algorithm makes predictions using a similarity measure?

ANS instance-based algorithm

12.What's the difference between a model parameter and a hyperparameter in a learning algorithm?

Ans model parameters are estimated from data automatically and model hyperparameters are set manually and are used in processes to help estimate model parameters

13.What are the criteria that model-based learning algorithms look for? What is the most popular method they use to achieve success? What method do they use to make predictions?

ANSModel based learning algorithm search for the optimal value of parameters in a model that will give the best results for the new instances. We often use a cost function or similar to determine what the parameter value has to be in order to minimize the function

14.Can you name four of the most important Machine Learning challenges?

ANSoverfitting the data (using a model too complicated), underfitting the data (using a simple model), lacking in data and nonrepresentative data.

15.What happens if the model performs well on the training data but fails to generalize the results to new situations? Can you think of three different options?

ANS

16.What exactly is a test set, and why would you need one?

ANS A test set in machine learning is a secondary data set that is used to test a machine learning program after it has been trained on an initial training data set.

17.What is a validation set's purpose?

ANS finding and optimizing the best model to solve a given problem

18.What precisely is the train-dev kit, when will you need it, how do you put it to use?

ANS.

19.What could go wrong if you use the test set to tune hyperparameters?

ANS you actually give the model a chance to "see" the test data and to develop a bias towards this test data. Therefore, you actually lose the possibility to find out how good your model would actually be on unseen data