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

Machine learning is the process where a computer learns the correct way of solving a problem by using the available resources. It is an algorithm that uses a large set of input data and uses it to correct itself until it gets to a point where it can be used to predict the result of an unknown data.

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

1. Natural Language Processing
2. Computer vision
3. Anomaly detection
4. Speech recognition

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

A data set withset of inputs and the correct/actual output is known as a labeled training data.For example a house price prediction dataset may have all the features which need to be used to predict the house price as well as the actual prices. It is then fed to the ml algo to fine tune its parameters to be able to predict the price of any house given any combination of features.

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

1. Natural Language Processing
2. Image recognition

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

1. Clustering
2. Anomaly detection
3. Pattern recognition
4. Neural Style Transfer

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

There is no labeled data set available as the terrain is unfamiliar. So we should use some variant of unsupervised learning.

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

Clustering algorithm.Kmeans

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

Supervised learning.

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

It is a process where the data becomes available in a sequential way and is used to update our predictor algorithm . It is different form our conventional approach where data is processed in batches.It process the data real time. For example stock market prediction data.

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

These are algorithms that enable the data in machine learning algorithms to reside in different location.Such types of algorithms are used when the data set which needs to be processed is too large to be held within a computer memory. Whereas in core learning we get all the data that needs to be processed in the memory of the computer that is having the algorithm.

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

Unsupervised Machine learning.

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

Model parameters are the actual weights and biases that need to be updated after every batch of data processing. These are the matrices that becomes the final product of an machine learning algorithm.These are used to predict the output of and future input data.Where as hyper parameter ate the set of parameters that are used to achieve the final state of an algorithm.They can be tuned to achieve the final state faster or in a more efficient way.

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?

Criteria:-

1. Interpretability.
2. The number of data points and features.
3. Data format.
4. Linearity of data.
5. Training time.
6. Prediction time.
7. Memory requirements.

To achieve success they use accuracy.They use extrapolation to make predictions

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

1. Overfitting
2. UnderFitting
3. Vanishing gradient
4. Exploding gradient

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?

Over fitting

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

We need a test set to test of out algorithm can perform well with an unknown data before productionising it to real world data.It is generally curated out of the training data set.

17.What is a validation set's purpose?

Validation dataset is another layer of testing our algorithm similar to test dataset

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

Train dev kit is a pre-trained model that can be used to build our own model on top of it. IT can be put to use by transfer learning.

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

Test sets are general smaller sets in comparison to the actual training data. Hence the tuning of hyper parameters may not be that efficient as we may be missing the problems that a large dataset my throw at us.