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

Sol. Machine learning means enabling the machine to learn by itself with the help of data provided by us.

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

Sol. Image Recognition, Speech Recognition, Traffic prediction, Product recommendations, Self-driving cars.

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

Sol. Labeled means that the dataset is having a label column also.

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

Sol. Classification and Regression

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

Sol. Customer segmentation, feature selection, analomy detection and Genetics clustering

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

Sol. Reinforcment Leaning model

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

Sol. DBSCAN

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

Sol. Supervised as it gives us a label of 0 or 1

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

Sol. Online learning is E-learning that that uses computer and internet combination for learning.

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

Sol. **Out of core learning** is working on data that is too big to fit on ram.

Core ML is designed to seamlessly take advantage of powerful hardware technology including CPU, GPU, and Neural Engine, in the most efficient way in order to maximize performance while minimizing memory and power consumption.

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

Sol. K-NEAREST NEIGHBOUR (KNN)

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

Sol. Model parameter: parameters given in the algorithm function

Hyperparameter: parameters given the algorithm after hyper parameter tuning.

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?

Sol. Criteria used: supervised or unsupervised learning

Method used: applying multiple algorithm based on classification or regression problem and choosing the algorithm based on roc-aoc curve or accuracy score or f-score

Method used for predictions: different for different algorithms

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

Sol. 1. Understanding the data relationship

   2. Handling missing values
   3. Handling data imbalance
   4. Choosing which algorithm to use

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?

Sol. 1. Model overfitting   2. Unrepresentative data sample   3. Stochastic Algorithm

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

Sol. TEST SET is used to test our model if it is giving good predictions with our testing dataset also.

Data is split into training and testing dataset.

17.What is a validation set's purpose?

Sol. Validation set is generally used in Stacking Ensemble Technique for testing models.

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

Sol. Training development kit is the dataset used for training of model.

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

Sol. Test dataset is smaller in size than train dataset thus tuning on test dataset can result in wrong hyperparameters tuning.