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

Ans: Machine learning is an application of Artificial Intelligence, that provides systems the ability to automatically learn and improve from experience without being explicitly programmed.

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

Ans: Used in image classification,

Used in Prediction to increase sales,

Used in health department to diagnose diseases on time,

Used in weather prediction.

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

Ans: labelled training set is sata which comes with label, It is used to train the data model.

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

**Ans:** The two most common supervised tasks are **regression and classification**. Common unsupervised tasks include clustering, visualization, dimensionality reduction, and association rule learning.

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

Ans: Four common unsupervised tasks **inclused clustering, visualization, dimensionality reduction , and association rule learning**.

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

Ans: **Reinforced Learning**

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

Ans: K mean clustering

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

Ans: Supervised learning

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

**Ans:** Online learning system is a learning system in which the machine learns as data is given in small streams continuously.

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

Ans: Out-of-core learning system is a system that can handle data that cannot fit into your computer memory. It uses online learning system to feed data in small bits.

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

Ans: Learning algorithm that relies on a similarity measure to make predictions is instance-based algorithm.

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

Ans: Model parameter determines how a model will predict given a new instance; model usually has more than one parameter (i.e. slope of a linear model). Hyperparameter is a parameter for the learning algorithm, not of a model.

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?

Model 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. The model makes prediction by using the value of the new instance and the parameters in its function.

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

*Four main challenges in Machine Learning include overfitting 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: **Underfitting** refers to a model that can neither model the training data nor generalize to new data. An underfit machine learning model is not a suitable model and will be obvious as it will have poor performance on the training data.

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

Ans: Validation set: A set of examples used to tune the parameters of a classifier, for example to choose the number of hidden units in a neural network. – Test set: **A set of examples used only to assess the performance of a fully-specified classifier**. These are the recommended definitions and usages of the terms.

**17.What is a validation set's purpose?**

Ans: A validation set is a set of **data used to train artificial intelligence (AI) with the goal** of 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?

The goal of dev-set is **to rank the models in term of their accuracy and helps us decide which model to proceed further with**. Using Dev set we rank all our models in terms of their accuracy and pick the best performing model.

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

**Cross**-validation is a technique that makes it possible to compare models (for model selection and hyperparameter tuning) without the need for a separate validation set.