**1. What is the concept of human learning? Please give two examples.**

Learning to drive a motor-car, typewriting, singing or memorizing a poem or a mathematical table, and music etc

**2. What different forms of human learning are there? Are there any machine learning equivalents?**

Linear regression, decision trees, random forest and support vector machines etc

**3. What is machine learning, and how does it work? What are the key responsibilities of machine**

**learning?**

Machine Learning is an AI technique that teaches computers to learn from experience. Machine learning algorithms use computational methods to “learn” information directly from data without relying on a predetermined equation as a model

* Designing ML systems.
* Researching and implementing ML algorithms and tools.
* Selecting appropriate data sets.
* Picking appropriate data representation methods.
* Identifying differences in data distribution that affects model performance.
* Verifying data quality.

**4. Define the terms ‘penalty’ and ‘reward’ in the context of reinforcement learning.**

If it makes the right move, it gets rewarded. If it makes a mistake, it receives a penalty

**5. Explain the term ‘learning’ as a search ?**

The goal of this search is to find the hypothesis that best fits the training examples. By selecting a hypothesis representation, the designer of the learning algorithm implicitly defines the space of all hypotheses that the program can ever represent and therefore can ever learn

**6. What are the various goals of machine learning? What is the relationship between these and**

**human learning?**

The goal of machine learning, closely coupled with the goal of AI, is to achieve a thorough understanding about the nature of learning process (both human learning and other forms of learning), about the computational aspects of learning behaviors, and to implant the learning capability in computer systems

**7. Illustrate the various elements of machine learning using a real-life illustration.**

Image recognition

Speech recognition

Medical diagnosis

Predictive analytics

8**. Provide an example of the abstraction method.**

Abstraction has been mainly studied in problem solving, theorem proving, knowledge representation (in particular for spatial and temporal reasoning) and machine learning. In such contexts, abstraction is defined as a mapping between formalisms that reduces the computational complexity of the task at stake.

**9. What is the concept of generalization? What function does it play in the machine learning**

**process?**

Generalization refers to your model's ability to adapt properly to new, previously unseen data, drawn from the same distribution as the one used to create the model

**10. What is classification, exactly? What are the main distinctions between classification and regression?**

Regression attempt to find the best fit line, which predicts the output more accurately- Works on continuous numeric data. Classification tries to find the decision boundary, which divides the dataset into different classes

**11. What is regression, and how does it work? Give an example of a real-world problem that was**

**solved using regression.**

A regression is a statistical technique that relates a dependent variable to one or more independent (explanatory) variables.

House price prediction using various independent features such as number of rooms, size of the house, balcony, bathrooms, etc

**12. Describe the clustering mechanism in detail.**

Clustering is the task of dividing the unlabeled data or data points into different clusters such that similar data points fall in the same cluster than those which differ from the others. In simple words, the aim of the clustering process is to segregate groups with similar traits and assign them into clusters

**13. Make brief observations on two of the following topics:**

**i. Machine learning algorithms are used**

Machine Learning algorithms are the programs that can learn the hidden patterns from the data, predict the output, and improve the performance from experiences on their own. Different algorithms can be used in machine learning for different tasks, such as simple linear regression that can be used for prediction problems like stock market prediction, and the KNN algorithm can be used for classification problems.

**ii. Studying under supervision**

Supervised learning is the types of machine learning in which machines are trained using well "labelled" training data, and on basis of that data, machines predict the output. The labelled data means some input data is already tagged with the correct output.

In supervised learning, the training data provided to the machines work as the supervisor that teaches the machines to predict the output correctly. It applies the same concept as a student learns in the supervision of the teacher.

**iii. Studying without supervision**

unsupervised learning is a machine learning technique in which models are not supervised using training dataset. Instead, models itself find the hidden patterns and insights from the given data. It can be compared to learning which takes place in the human brain while learning new things.

**iv. Reinforcement learning is a form of learning based on positive reinforcement.**

Reinforcement learning is a machine learning training method based on rewarding desired behaviors and/or punishing undesired ones. In general, a reinforcement learning agent is able to perceive and interpret its environment, take actions and learn through trial and error.