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

**Ans:-** Learning is the process of acquiring new understanding, knowledge, behaviour’s, skills, values, attitudes, and preferences. Examples are:- Learning to drive a motor-car, typewriting, singing.

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

**Ans:-** Learning through association ,Learning through consequences and Learning through observation are human learnings. Human-Guided machine learning is a type of supervised learning.

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

**Ans:-** Machine learning is a subset of artificial intelligence t starts with the determination of the type of the problems, where we select the machine learning techniques such as Classification, Regression, Cluster analysis, Association, etc. then build the model using prepared data, and evaluate the model.

1. **Define the terms penalty and reward in the context of reinforcement learning?**

**Ans:-** Reinforcement learning is a type of machine learning algorithm that uses a reward-penalty method to teach an AI system. If it makes the right move, it gets rewarded. If it makes a mistake, it receives a penalty.

1. **Explain the term "learning as a search"?**

**Ans:-** Learning can be viewed as a search through the space of all sentences in a concept description language for a sentence that best describes the data. The goal of the concept learning search is to find the hypothesis that best fits the training examples.

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

**Ans:-** The goal of ML, in simples words, is to understand the nature of (human and other forms of) learning, and to build learning capability in computers. Machine learning and human learnings has some similarities as It can be divided into four interrelated components: Data storage utilizes observation, memory, and recall to provide a factual basis for further reasoning

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

**Ans:-** Facial recognition:- Based on pixels in any image It can identify an object.

## Speech recognition:- Machine learning can translate speech into text

## Medical diagnosis:- Machine learning can help with the diagnosis of diseases.

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

**Ans:-**  Real life example of Abstraction method is ATM Machine.

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

**Ans:-** 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. It develops intuition about overfitting.

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

**Ans:-** Classification is the process of arranging things in groups or classes. The main distinctions between classification and regression is regression helps predict a continuous quantity, classification predicts discrete class labels.

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

**Ans:-** Regression algorithms predict a continuous value based on the input variables, it shows the correlation independent variables to dependent variables. Example of regression is predicting the price of a house given house features.

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

**Ans**:- In clustering, a group of different data objects is classified as similar objects. One group means a cluster of data. Data sets are divided into different groups in the cluster analysis, which is based on the similarity of the data.

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

i. Machine learning algorithms are used

ii. Studying under supervision

iii. Studying without supervision

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

**Ans:- 1. Machine learning algorithms are used**

Machine learning is a subset of artificial intelligence which receives and analyse input data to predict output values within an acceptable range. As new data is fed to these algorithms, they learn and optimise their operations to improve performance, developing 'intelligence' over time. it starts with the determination of the type of the problems, where we select the machine learning techniques such as Classification, Regression, Cluster analysis, Association, etc. then build the model using prepared data, and evaluate the model.

**2. 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. The goal of supervised learning is to understand data within the context of a particular question. There are two types of Supervised Learning techniques: Regression and Classification. One real life example of supervised learning problems is predicting house prices.