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

Answer : Human learning is a process of acquiring knowledge. Our behavior, skills, values and ethics are acquired when we process information through our minds and learn.

Children learn while they play, experiment, and interact.

Driving a car is learning.

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

Answer : Supervised learning is similar to **concept learning** (Bruner & Austin, 1986), where a person is required to classify new objects into existing categories, by matching the features of the new objects to examples in the categories

Artificial neural networks follow the neuronal principle of **Hebbian learning**, where the algorithm centres on inputs with similar properties, just like how neurons that activate simultaneously strengthen the synaptic link between each other

Reinforcement learning is inspired by the reward system of **operant conditioning.**

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

Answer : Machine learning is field of study that gives computers and ability to perform task without being explicitly programmed.

Responsibilities : Gathering Data,Preparing that data,Choosing a model,Training,Evaluation,Hyperparameter ,TuningPrediction.

4. Define the terms "penalty" and "reward" in the context of reinforcement learning.

Answer : In Reinforcement Learning (RL), agents are trained on a reward and punishment mechanism. **The agent is rewarded for correct moves and punished for the wrong ones**.

5. Explain the term "learning as a search"?

Answer : 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. Alternatively, it can be viewed as a search through all hypotheses in a hypothesis space.

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

Answer : The purpose of machine learning is to discover patterns in your data and then make predictions based on often complex patterns to answer business questions, detect and analyse trends and help solve problems.

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

Answer : Supervised ML is used in spam detection. Unsupervised used in customer classification.

8. Provide an example of the abstraction method.

Answer : An abstract method is a method that has a declaration but does not have an implementation.

```
class Polygon(ABC):

    @abstractmethod
    def noofsides(self):
        pass
```

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

Answer : **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.

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

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

Answer : Regression in predicting a continuous numerical value depending on model created from data of same type.

House prices estimation, stock price estimation are examples of regression.

12. Describe the clustering mechanism in detail.

Answer : Clustering is the **task of dividing the population or data points into a number of groups** such that data points in the same groups are more similar to other data points in the same group than those in other groups. In simple words, the aim is to segregate groups with similar traits and assign them into clusters.