1. Explain the term machine learning, and how does it work? Explain two machine learning applications in the business world. What are some of the ethical concerns that machine learning applications could raise?

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.
Fare prediction, face attendance.
Ethical concerns:

- Cost to innovation.
- Harm to physical integrity.
- Lack of access to public services.
- Lack of trust.
- "Awakening" of AI.
- Security problems.
- Lack of quality data.
- Disappearance of jobs.

2. Describe the process of human learning:

i. Under the supervision of experts
classical conditioning
ii. With the assistance of experts in an indirect manner
operant conditioning
iii. Self-education
observational learning

3. Provide a few examples of various types of machine learning.

For example, an algorithm would be trained with pictures of dogs and other things, all labeled by humans, and the machine would learn ways to identify pictures of dogs on its own.
4. Examine the various forms of machine learning.

There are four types of machine learning algorithms: supervised, semi-supervised, unsupervised and reinforcement.
5. **Can you explain what a well-posed learning problem is ? Explain the main characteristics that must be present to identify a learning problem properly.**

A (machine learning) problem is well-posed if a solution to it exists, if that solution is unique, and if that solution depends on the data / experience but it is not sensitive to (reasonably small) changes in the data / experience
6**. Is machine learning capable of solving all problems? Give a detailed explanation of your answer.**

Machine learning is now seen as a silver bullet for solving all problems, but sometimes it is not the answer

7. What are the various methods and technologies for solving machine learning problems? Any two of them should be defined in detail.

Machine learning uses two types of techniques: supervised learning, which trains a model on known input and output data so that it can predict future outputs, and unsupervised learning, which finds hidden patterns or intrinsic structures in input data.

8. Can you explain the various forms of supervised learning? Explain each one with an example application.

Different Types of Supervised Learning

- Regression. In regression, a single output value is produced using training data.
- Classification. It involves grouping the data into classes.

9. What is the difference between supervised and unsupervised learning? With a sample application in each region, explain the differences.

To put it simply, supervised learning uses labeled input and output data, while an unsupervised learning algorithm does not. In supervised learning, the algorithm "learns" from the training dataset by iteratively making predictions on the data and adjusting for the correct answer

10. Describe the machine learning process in depth.

Machine learning (ML) is a type of artificial intelligence (AI) that allows software applications to become more accurate at predicting outcomes without being explicitly programmed to do so. Machine learning algorithms use historical data as input to predict new output values.
a. Make brief notes on any two of the following:

MATLAB is one of the most widely used programming languages : yes

ii. Deep learning applications in healthcare : optical character recognition (OCR) technology

iii. Study of the market basket

iv. Linear regression (simple)

11. Make a comparison between:-

1. Generalization and abstraction

Abstraction is a technique to reduce the complexity of a problem by filtering out irrelevant properties while preserving all the important ones necessary to still be able solve a given problem. Generalization is a technique to apply knowledge previously acquired to unseen circumstances or extend that knowledge beyond the scope of the original problem.

2. Learning that is guided and unsupervised

3. **Regression and classification**

The most significant difference between regression vs classification is that while regression helps predict a continuous quantity, classification predicts discrete class labels. There are also some overlaps between the two types of machine learning algorithms