**1. What is Machine Learning?**  
Machine Learning is a branch of Artificial Intelligence where computer systems learn patterns from data and improve their performance on tasks without being explicitly programmed.

**2. Give one real-life example of Machine Learning.**  
Email spam filtering – ML algorithms analyze emails and learn to classify them as *spam* or *not spam*.

**3. What is the difference between Artificial Intelligence (AI) and Machine Learning (ML)?**

* **AI**: A broad field where machines are designed to act intelligently like humans.
* **ML**: A subset of AI that focuses on learning from data and improving performance automatically.

**4. What are the types of Machine Learning?**

* **Supervised Learning**
* **Unsupervised Learning**
* **Reinforcement Learning**

**5. What is supervised learning? Give an example.**

Supervised learning uses labeled data (inputs + correct outputs) to train models.  
*Example*: Predicting house prices based on features like size, location, and number of rooms.

**6. What is unsupervised learning? Give an example.**

Unsupervised learning uses unlabeled data to find hidden patterns or groupings.  
*Example*: Customer segmentation in marketing.

**7. What is reinforcement learning? Give an example.**  
Reinforcement learning is when an agent learns by interacting with an environment and receiving rewards or penalties.  
*Example*: Training a robot to walk.

**8. What is the difference between training data and test data?**

* **Training data**: Used to teach the model.
* **Test data**: Used to evaluate how well the model performs on unseen data.

**9. What are features in a dataset?**  
Features are input variables that describe the data.  
*Example*: Age, income, and location in a customer dataset.

**10. What are labels (targets) in a dataset?**  
Labels are the correct outputs the model is supposed to predict.  
*Example*: Whether a customer will buy a product (Yes/No).

**11. What is the difference between classification and regression?**

* **Classification**: Predicts categories (e.g., spam or not spam).
* **Regression**: Predicts continuous values (e.g., predicting a house price).

**12. What does the term model mean in ML?**  
A model is the mathematical representation that learns from data and makes predictions.

**13. What is overfitting in ML?**  
Overfitting happens when a model learns the training data too well, including noise, and performs poorly on new data.

**14. What is underfitting in ML?**  
Underfitting happens when a model is too simple and fails to capture patterns in the data, leading to poor performance.

**15. What is a confusion matrix used for?**  
It is used to evaluate classification models by showing correct and incorrect predictions in a table format.

**16. Why do we split data into training and testing sets?**  
To train the model on one portion and test it on another, ensuring it generalizes well to unseen data.

**17. What is a decision tree?**  
A decision tree is a model that splits data into branches based on conditions, making decisions like a flowchart.  
*Example*: Deciding loan approval based on income, credit score, and employment status.

**18. What is a linear regression model used for?**  
It is used to predict a continuous outcome by finding a straight-line relationship between inputs and outputs.  
*Example*: Predicting sales based on advertising budget.

**19. What does accuracy mean in ML?**  
Accuracy measures how often the model’s predictions are correct, usually expressed as a percentage.

**20. What are some common applications of Machine Learning in daily life?**

* Voice assistants (Siri, Alexa)
* Online shopping recommendations
* Spam email detection
* Fraud detection in banking
* Self-driving cars
* Facial recognition