**1. What is prior probability? Give an example.**

Prior probability refers to the initial belief or probability assigned to an event before any new evidence is taken into account. For example, in a medical diagnosis scenario, the prior probability of a patient having a certain disease could be based on general population statistics.

**2. What is posterior probability? Give an example.**

Posterior probability refers to the updated probability of an event after taking new evidence into consideration using Bayes' theorem. For example, in the same medical diagnosis scenario, the posterior probability of a patient having a certain disease would be calculated by combining the prior probability with the diagnostic test results.

**3. What is likelihood probability? Give an example.**

Likelihood probability refers to the probability of observing a certain outcome or data given a specific hypothesis or model. For example, in a coin flipping experiment, the likelihood probability of observing a sequence of heads and tails would depend on the assumed probability distribution of the coin.

**4. What is Naïve Bayes classifier? Why is it named so?**

The Naïve Bayes classifier is a probabilistic classification algorithm that applies Bayes' theorem with the assumption of independence between features. It is named "naïve" because it assumes that the presence or absence of a particular feature in a class is unrelated to the presence or absence of other features.

**5. What is optimal Bayes classifier?**

The optimal Bayes classifier is a theoretical concept that represents the ideal classification algorithm based on Bayes' theorem. It assumes complete knowledge of the underlying probability distributions and provides the best possible classification performance.

**6. Write any two features of Bayesian learning methods.**

Two features of Bayesian learning methods are their ability to incorporate prior knowledge or beliefs into the learning process, and their ability to update probabilities based on new evidence or data.

**7. Define the concept of consistent learners.**

Consistent learners are learning algorithms that converge to the true underlying model or function as the amount of training data increases. They consistently improve their performance with more data.

**8. Write any two strengths of Bayes classifier.**

Two strengths of the Bayes classifier are its simplicity and efficiency, especially for high-dimensional data, and its ability to handle missing data or incomplete feature information by using probabilistic estimates.

**9. Write any two weaknesses of Bayes classifier.**

Two weaknesses of the Bayes classifier are its assumption of feature independence, which may not hold in all cases, and its sensitivity to the choice of prior probabilities, which can affect classification results.

**10. Explain how Naïve Bayes classifier is used for**

**1. Text classification**

In text classification, Naïve Bayes classifier can be used to classify documents into predefined categories such as spam detection, sentiment analysis, or topic classification, by considering the occurrence of words or features in the text.

**2. Spam filtering**

In spam filtering, Naïve Bayes classifier can be used to classify incoming emails as spam or non-spam based on the occurrence of specific words or patterns in the email content.

**3. Market sentiment analysis**

In market sentiment analysis, Naïve Bayes classifier can be used to classify social media posts or news articles as expressing positive, negative, or neutral sentiment towards a particular stock or market, by considering the presence of sentiment-related words or phrases.