Q1. Define the Bayesian interpretation of probability.

Bayesian probability represents a subjective degree of belief that an event will occur, based on prior knowledge and available evidence.

Q2. Define probability of a union of two events with equation.

P(A ∪ B) = P(A) + P(B) - P(A ∩ B)

Q3. What is joint probability? What is its formula?

* Joint probability is the probability of the occurrence of two or more events simultaneously.
* Formula: P(A ∩ B) or P(A and B)

Q4. What is chain rule of probability?

* The chain rule calculates the joint probability of multiple events by breaking it down into conditional probabilities.
* Formula: P(A ∩ B) = P(A) \* P(B|A)

Q5. What is conditional probability means? What is the formula of it?

* Conditional probability measures the likelihood of an event occurring given that another event has already occurred.
* Formula: P(A|B) = P(A ∩ B) / P(B)

Q6. What are continuous random variables?

Continuous random variables can take any real value within a given range, forming a continuous probability distribution.

Q7. What are Bernoulli distributions? What is the formula of it?

* Bernoulli distribution models a binary outcome (success or failure) with a single trial.
* Formula: P(X = x) = p^x \* (1 - p)^(1 - x)

Q8. What is binomial distribution? What is the formula?

* Binomial distribution models the number of successes in a fixed number of independent trials with the same probability.
* Formula: P(X = k) = nCk \* p^k \* (1 - p)^(n - k)

Q9. What is Poisson distribution? What is the formula?

* Poisson distribution models the number of events occurring in a fixed interval of time or space.
* Formula: P(X = x) = (λ^x \* e^(-λ)) / x!

Q10. Define covariance.

* Covariance measures the degree of joint variability between two random variables.
* Formula: Cov(X, Y) = E[(X - μx) \* (Y - μy)]

Q11. Define correlation

* Correlation measures the strength and direction of a linear relationship between two random variables.
* Formula: Corr(X, Y) = Cov(X, Y) / (σx \* σy)

Q12. Define sampling with replacement. Give example.

* Sampling with replacement involves drawing samples from a population and returning each sample before drawing the next.
* Example: Rolling a die and putting it back before rolling again.

Q13. What is sampling without replacement? Give example.

* Sampling without replacement involves drawing samples from a population without returning the samples.
* Example: Drawing cards from a deck without putting them back.

Q14. What is hypothesis? Give example.

* A hypothesis is a statement or proposition that can be tested or investigated to determine its validity.
* Example: Hypothesis testing in statistics aims to determine whether a sample's behavior is consistent with a population parameter.