

## COVARIANCE FORMULA

A mathematical measure that helps us know how two random variables relate to each other is known as covariance. With the help of covariance, we can know how any change in one of the variables produces a change in another variable. When one variable increases, the other increases too, this is indicated by a positive covariance. On the other hand, a negative covariance shows us that when one variable increases, the other is liable to decrease. The covariance measure is dependent on the variable scale, which is computed with the help of correlation.







#### Q1: If the covariance between two variables is positive, what does it indicate about their relationship?

A: They have a strong positive relationship.

B: They have a strong negative relationship.

C: They have no relationship.

D: They are not related.

#### Q2: What is the range of possible values for covariance?

A: -∞ to ∞ B: -1 to 1 C: 0 to 1 D: 0 to ∞

#### Q3: What is the range of possible values for the Pearson correlation coefficient (r)?

A: -∞ to ∞ B: -1 to 1 C: 0 to 1 D: 0 to ∞

#### Q4: What is the correct covariance formula?

A: Cov(X,Y)=E[(Y-EY)]=E[XY]-(EX)(EY)B: Cov(X,Y)=E[(X-EX)]=E[XY]-(EX)(EY)C: Cov(X,Y)=E[(X-EX)(Y-EY)]=E[XY]-(EX)D: Cov(X,Y)=E[(X-EX)(Y-EY)]=E[XY]-(EX)(EY)

## Q5: \_\_\_\_\_\_ is represented in a situation when one variable is greater than its average and the other variable is also greater than its average.

- A: Positive Covariance
- B: Negative covariance
- C: Zero covariance
- D: None of the above



### Q6: \_\_\_\_\_\_ is represented in a situation where if one variable is greater than its mean, the other is likely to be smaller than its mean.

- A: Positive Covariance
- B: Negative covariance
- C: Zero covariance
- D: None of the above

# Q7: \_\_\_\_\_\_ represents no relationship between variables, i.e. any change in one variable will not be responsible for producing change in another variable.

- A: Positive Covariance
- B: Negative covariance
- C: Zero covariance
- D: None of the above

### Q8: We can know about the direction, strength, and linearity of the relationship between the variables with the help of:

- A: Variance
- **B:** Covariance
- C: Constants
- D: Pearson's correlation coefficient

#### Q9: Covariance helps us find out the value of \_\_\_\_\_ association between two random variables.

- A: Non-linear B: Linear
- C: Curved
- D: None of the above

## Q10: A covariance matrix works as a \_\_\_\_\_ of relationships between more than two variables in a given dataset.

A: Summarisation B: Difference C: Product D: Dividend E Edulate



#### Answers

- Q1: C They have no relationship.
- **Q2:** A -∞ to ∞
- **Q3:** B -1 to 1
- **Q4:** D Cov(X,Y) = E[(X-EX)(Y-EY)] = E[XY] (EX)(EY)
- Q5: A Positive Covariance
- Q6: B Negative covariance
- Q7: C Zero covariance
- Q8: D Pearson's correlation coefficient
- Q9: B Linear
- Q10: A Summarisation