

STATISTICAL

ASSIGNMENT NO. 3

Q1. B)

Q2. C)

Q3. A)

Q4. A)

Q5. B)

Q6. B)

Q7. B)

Q8. D)

Q9. A)

Q10. Bayes' Theorem states that the conditional probability of an event, based on the occurrence of another event, is equal to the likelihood of the second event given the first event multiplied by the probability of the first event. Bayes theorem is also known as the formula for the probability of "causes". For example: if we have to calculate the probability of taking a blue ball from the second bag out of three different bags of balls, where each bag contains three different colour balls viz. red, blue, black. Bayes theorem provides a way to calculate the probability of a hypothesis based on its prior probability, the probabilities of observing various data given the hypothesis, and the observed data itself.

$$\text{Formula, } P(A | B) = \frac{P(B | A).P(A)}{P(B)}$$

Q11. Z-score is a statistical measurement that describes a value's relationship to the mean of a group of values. Z-score is measured in terms of standard deviations from the mean. If a Z-score is 0, it indicates that the data point's score is identical to the mean score. The formula for calculating a z-score is $z = (x - \mu) / \sigma$, where x is the raw score, μ is the population mean, and σ is the population standard deviation. As the formula shows, the z-score is simply the raw score minus the population mean, divided by the population standard deviation.

Q12. A t-test is a statistical test that compares the means of two samples. It is used in hypothesis testing, with a null hypothesis that the difference in group means is zero and an alternate hypothesis that the difference in group means is different from zero.

Q13. In statistics, a percentile is a term that describes how a score compares to other scores from the same set. While there is no universal definition of percentile, it is commonly expressed as the percentage of values in a set of data scores that fall below a given value.

Q14. Analysis of variance (ANOVA) is an analysis tool used in statistics that splits an observed aggregate variability found inside a data set into two parts: systematic factors and random factors. The systematic factors have a statistical influence on the given data set, while the random factors do not. Analysts use the ANOVA test to determine the influence that independent variables have on the dependent variable in a regression study.

Q15. Calculate the overall mean, or mean of the combined groups. Calculate the within-group variation, or deviation of each score from the group mean. Find the between-group variation, or deviation of each group mean from the overall mean.