Statistics Worksheet-3

Q1-Which of the following is the correct formula for total variation?
Answer-b) Total Variation = Residual Variation + Regression Variation

Q2- Collection of exchangeable binary outcomes for the same covariate data are called _____ outcomes.
Answer-c) binomial

Q3- How many outcomes are possible with Bernoulli trial?
Answer-a) 2

Q4-if Ho is true and we reject it is called
Answer-a) Type-I error

Q5- Level of significance is also called
Answer-

Q6- The chance of rejecting a true hypothesis decreases when sample size is:
Answer- b) Increase

Q7- Which of the following testing is concerned with making decisions using data?
Answer- b) Hypothesis

Q 8- What is the purpose of multiple testing in statistical inference?
Answer- d) All of the mentioned

Q9- Normalized data are centred at and have units equal to standard deviations of the original data
Answer- a) 0

Q10-What Is Bayes' Theorem?
Bayes' theorem **describes the probability of occurrence of an event related to any condition. It is also considered for the case of conditional probability. Bayes theorem is also known as the formula for the probability of "causes".**

Formula for Bayes'Theorem:

$$P(A|B) = P(B|A).P(A)/ P(B)$$

Where:

- **P(A|B) – the probability of event A occurring, given event B has occurred**
- **P(B|A) – the probability of event B occurring, given event A has occurred**
- **P(A) – the probability of event A**
- **P(A) – the probability of event A**

Q11- What is z-score?
Answer- Z-score indicates how much a given value differs from the standard deviation.
The Z-score, or standard score, is the number of standard deviations a given data point lies above or below mean. Standard deviation is essentially a reflection of the amount of variability within a given data set.

The basic z score formula for a sample is:

$$z = (x – \mu) / \sigma$$

Where:
x = Standardized random variable.
μ= Mean
σ = Standard Deviation

Q12. What is t-test?
Answer- **The t-test is a test that is mainly used to compare the mean of two groups of samples. It is meant for evaluating whether the means of the two sets of data are statistically significantly different from each other.**

3 types of t-test :

- **The one-sample t-test,** which is used to compare the mean of a population with a theoretical value.
- **The unpaired two-sample t-test,** which is used to compare the mean of two independent given samples.
- **The paired t-test,** which is used to compare the means between two groups of samples that are related.

Q13- What is percentile
Answer- 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.

Percentiles show how a given value compares to others. The general rule is that if a value is in the kth percentile, it is greater than K per cent of the total values.
For example, a person with an IQ of 120 is at the 91st percentile, which indicates that their IQ is higher than 91 percent of other scores.

Q14- What is ANOVA?
Answer-**Analysis of Variance (ANOVA) is a statistical formula used to compare variances across the means (or average) of different groups**

Q15 How can ANOVA help?
Answer-ANOVA is helpful for testing three or more variables. It is similar to multiple two-sample t-tests. However, it results in fewer type I errors and is appropriate for a range of issues. ANOVA groups differences by comparing the means of each group and includes spreading out the variance into diverse sources.