STATISTICS WORKSHEET-3

Q1 to Q9 have only one correct answer. Choose the correct option to answer your question.

1. Which of the following is the correct formula for total variation?
   a) Total Variation = Residual Variation – Regression Variation
   b) Total Variation = Residual Variation + Regression Variation
   c) Total Variation = Residual Variation * Regression Variation
   d) All of the mentioned

Ans:- b) Total Variation = Residual Variation + Regression Variation

2. Collection of exchangeable binary outcomes for the same covariate data are called_____outcomes.
   a) random
   b) direct
   c) binomial
   d) none of the mentioned

Ans:- c) binomial

3. How many outcomes are possible with Bernoulli trial?
   a) 2
   b) 3
   c) 4
   d) None of the mentioned

Ans:- a) 2

4. If Ho is true and we reject it is called
   a) Type-I error
   b) Type-II error
   c) Standard error
   d) Sampling error

Ans:- b)Type-II error

5. Level of significance is also called:
   a) Power of the test
   b) Size of the test
   c) Level of confidence
   d) Confidence coefficient

Ans:- a) Power of the test

6. The chance of rejecting a true hypothesis decreases when sample size is:
   a) Decrease
   b) Increase
   c) Both of them
   d) None

Ans:- d) None

7. Which of the following testing is concerned with making decisions using data?
   a) Probability
   b) Hypothesis
   c) Causal
   d) None of the mentioned

Ans:- b) Hypothesis

8. What is the purpose of multiple testing in statistical inference?
   a) Minimize errors
   b) Minimize false positives
   c) Minimize false negatives
   d) All of the mentioned

Ans:- d) All of the mentioned

9. Normalized data are centred at____and have units equal to standard deviations of the original data
   a) 0
   b) 5
   c) 1
   d) 10

Ans:- a) 0

Q10and Q15 are subjective answer type questions, Answer them in your own words briefly.

10. What Is Bayes' Theorem?

Ans:- 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.
The Bayes theorem (also known as the Bayes' rule) is a mathematical formula used to determine the conditional probability of events.
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.

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

11. What is z-score?

Ans:- A z score is simply defined as the number of standard deviation from the mean. The z-score can be calculated by subtracting mean by test value and dividing it by standard value. Where x is the test value, μ is the mean and σ is the standard value

$$z = (x-\mu)/\sigma$$

12. What is t-test?

Ans:- 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.

$$t=\bar{x}-\mu/\sigma/\sqrt{n}$$

13. What is percentile?

Ans:- Percentiles - It is a statistician's unit of measurement that indicates the value below which a given percentage of observations in a group of observations fall.

14. What is ANOVA?

Ans:- ANOVA (Analysis of Variance): ANOVA is the way to find out if experimental results are significant. One-way ANOVA compares two means from two independent groups using only one independent variable. Two-way ANOVA is the extension of one-way ANOVA using two independent variables to calculate the main effect and interaction effect.

15. How can ANOVA help?

Ans:- 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.