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
   Answer – 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
   Answer – a) random

3. How many outcomes are possible with Bernoulli trial?
   a) 2
   b) 3
   c) 4
   d) None of the mentioned
   Answer – 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
   Answer – a) Type-I 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
   Answer – b) Size 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
   Answer – b) Increase

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

   Answer – 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
Answer – a) 0

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

10. What Is Bayes' Theorem?

Answer - 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 used to find the reverse probabilities if we know the conditional probability of an event.

The formula for Bayes theorem is:
P(A|B)= [P(B|A). P(A)]/P(B)
Where P(A) and P(B) are the probabilities of events A and B.
P(A|B) is the probability of event A given B
P(B|A) is the probability of event B given A.

11. What is z-score?
Answer - 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.

12. 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.
There are many types of t-test. Some of these are:
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.

13. What is percentile?
Answer - A percentile is a comparison score between a particular score and the scores of the rest of a group. It shows the percentage of scores that a particular score surpassed.

14. What is ANOVA?
Answer - ANOVA, or analysis of variance, is a statistical method used to determine whether there are significant differences between the means of two or more groups. It separates the observed variation found within a data set into components attributable to different sources of variation.

15. How can ANOVA help?
Answer - ANOVA helps you compare how different groups are different from each other and allows you to see if any two groups are statistically similar.