

### 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?**

b) Total Variation = Residual Variation + Regression Variation

**2. Collection of exchangeable binary outcomes for the same covariate data are called outcomes.**

c) binomial

**3. How many outcomes are possible with Bernoulli trial?**

a) 2

**4. If  $H_0$  is true and we reject it is called**

a) Type-I error

**5. Level of significance is also called:**

a) Power of the test

**6. The chance of rejecting a true hypothesis decreases when sample size is:**

b) Increase

**7. Which of the following testing is concerned with making decisions using data?**

b) Hypothesis

**8. What is the purpose of multiple testing in statistical inference?**

d) All of the mentioned

**9. Normalized data are centred at and have units equal to standard deviations of the original data**

a) 0

**Q10 and Q15 are subjective answer type questions, Answer them in your own words briefly**

**10. What Is Bayes' Theorem?**

Bayes, is a mathematical formula for determining conditional Probability is the likelihood of an outcome occurring, based on a previous outcome having occurred in similar circumstances. Bayes' theorem provides a way to revise existing predictions or theories (update probabilities) given new or additional evidence.

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

It is used in Machine Learning.

#### 11. What is z-score?

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

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

- $z$  = Z-score
- $x$  = the value being evaluated
- $\mu$  = the mean
- $\sigma$  = the standard deviation

#### 12. What is t-test?

**a statistical test that is used to compare the means of two groups**. It is often used in hypothesis testing to determine whether a process or treatment actually has an effect on the population of interest, or whether two groups are different from one another.

#### 13. What is percentile?

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?

Analysis of variance, or ANOVA, is **a statistical method that separates observed variance data into different components to use for additional tests**. A one-way ANOVA is used for three or more groups of data, to gain information about the relationship between the dependent and independent variables.

#### 15. How can ANOVA help?

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

