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

1. Bernoulli random variables take (only) the values 1 and 0.

a) True

b) False

Ans.A) True

2. Which of the following theorem states that the distribution of averages of iid variables, properly

normalized, becomes that of a standard normal as the sample size increases?

a) Central Limit Theorem

b) Central Mean Theorem

c) Centroid Limit Theorem

d) All of the mentioned

Ans. A) Central Limit Theorem

3. Which of the following is incorrect with respect to use of Poisson distribution?

a) Modeling event/time data

b) Modeling bounded count data

c) Modeling contingency tables

d) All of the mentioned

Ans. B) Modeling bounded count data

4. Point out the correct statement.

a) The exponent of a normally distributed random variables follows what is called the log-normal

distribution

b) Sums of normally distributed random variables are again normally distributed even if the variables

are dependent

c) The square of a standard normal random variable follows what is called chi-squared

distribution

d) All of the mentioned

Ans. D) All of the mentioned

5. _____ random variables are used to model rates.

a) Empirical

b) Binomial

c) Poisson

d) All of the mentioned

Ans. C) Poisson

6. 10. Usually replacing the standard error by its estimated value does change the CLT.

a) True

b) False

Ans B) False

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

a) Probability

b) Hypothesis

c) Causal

d) None of the mentioned

Ans. D) None of the mentioned

8. 4. Normalized data are centered at_____and have units equal to standard deviations of the

original data.

a) 0

b) 5

c) 1

d) 10

Ans. A) 0

9. Which of the following statement is incorrect with respect to outliers?

a) Outliers can have varying degrees of influence

b) Outliers can be the result of spurious or real processes

c) Outliers cannot conform to the regression relationship

d) None of the mentioned

Ans. c) Outliers cannot conform to the regression relationship

WORKSHEET

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

10. What do you understand by the term Normal Distribution?

Ans. Normal distribution, also known as the Gaussian distribution, is a probability distribution that is symmetric about the mean, showing that data near the mean are more frequent in occurrence than data far from the mean. In graphical form, the normal distribution appears as a "bell curve".

11. How do you handle missing data? What imputation techniques do you recommend?

Ans. . How do you handle missing data? What imputation techniques do you recommend?

Ans. When dealing with missing data, data scientists can use two primary methods to solve the error: imputation or the removal of data. The imputation method develops reasonable guesses for missing data. It's most useful when the percentage of missing data is low.

Imputation Techniques

- Complete Case Analysis(CCA):- This is a quite straightforward method of handling the Missing Data, which directly removes the rows that have missing data i.e we consider only those rows where we have complete data i.e data is not missing. ...
- Arbitrary Value Imputation. ...
- Frequent Category Imputation.

12. What is A/B testing?

Ans. A/B testing (also known as split testing or bucket testing) is a method of comparing two versions of a webpage or app against each other to determine which one performs better. A/B testing is essentially an experiment where two or more variants of a page are shown to users at random, and statistical analysis is used to determine which variation performs better for a given conversion goal

13. Is mean imputation of missing data acceptable practice?

Ans. Mean imputation is typically considered terrible practice since it ignores feature correlation

14. What is linear regression in statistics?

Ans. Linear regression analysis is used to predict the value of a variable based on the value of another variable. The variable you want to predict is called the dependent variable. The variable you are using to predict the other variable's value is called the independent variable.

15. What are the various branches of statistics?

Ans. Two branches, *descriptive statistics* and *inferential statistics*, comprise the field of statistics.

Descriptive Statistics

CONCEPT The branch of statistics that focuses on collecting, summarizing, and presenting a set of data.

EXAMPLES The average age of citizens who voted for the winning candidate in the last presidential election, the average length of all books about statistics, the variation in the weight of 100 boxes of cereal selected from a factory's production line.

INTERPRETATION You are most likely to be familiar with this branch of statistics, because many examples arise in everyday life. Descriptive statistics forms the basis for analysis and discussion in such diverse fields as securities trading, the social sciences, government, the health sciences, and professional sports. A general familiarity and widespread availability of descriptive methods in many calculating devices and business software can often make using this branch of statistics seem deceptively easy. (Chapters 2 and 3 warn you of the common pitfalls of using descriptive methods.)

Inferential Statistics

CONCEPT The branch of statistics that analyzes sample data to draw conclusions about a population.

EXAMPLE A survey that sampled 2,001 full-or part-time workers ages 50 to 70, conducted by the American Association of Retired Persons (*AARP*), discovered that 70% of those polled planned to work past the traditional mid-60s retirement age. By using methods discussed in Section 6.4, this statistic could be used to draw conclusions about the population of all workers ages 50 to 70.

INTERPRETATION When you use inferential statistics, you start with a hypothesis and look to see whether the data are consistent with that hypothesis. Inferential statistical methods can be easily misapplied or misconstrued, and many inferential methods require the use of a calculator or computer.