

Q1. **What is Statistics?** Statistics is a branch of mathematics that deals with the collection, analysis, interpretation, presentation, and organization of data. It provides methods for drawing conclusions about populations or processes based on data from a sample.

Q2. **Types of Statistics:**

- Descriptive Statistics: Descriptive statistics are used to summarize and describe the important characteristics of a dataset. For example, calculating the mean, median, and mode of a set of exam scores to understand the central tendency.
- Inferential Statistics: Inferential statistics involve making predictions or inferences about a population based on a sample of data. For instance, using a sample of voters to predict the outcome of an election.

Q3. **Types of Data:**

- Qualitative Data: Qualitative data describes qualities or characteristics and can be categorical. For example, the color of a car, marital status, or type of fruit.
- Quantitative Data: Quantitative data consists of numerical measurements or quantities. It can be discrete or continuous. For example, the height of students in a class or the number of cars in a parking lot.

Q4. **Categorization of Datasets:**

- (i) Grading in exam: Qualitative (Ordinal)
- (ii) Colour of mangoes: Qualitative (Nominal)
- (iii) Height data of a class: Quantitative (Continuous)
- (iv) Number of mangoes exported by a farm: Quantitative (Discrete)

Q5. **Levels of Measurement:**

- Nominal Level: Nominal variables are categorical and do not have a meaningful order. For example, gender (male, female).
- Ordinal Level: Ordinal variables have a natural order but the differences between values may not be equal. For instance, ranking in a competition (1st, 2nd, 3rd).

Q6. **Importance of Understanding Level of Measurement:** Understanding the level of measurement is crucial because it determines the statistical analyses that can be applied to the data. For example, treating ordinal data as numerical in nature can lead to misleading conclusions. If we have ordinal data representing education levels

(e.g., high school, bachelor's, master's), treating it as numerical would imply that the difference between high school and bachelor's is the same as between bachelor's and master's, which might not be true.

Q7. **Difference between Nominal and Ordinal Data:** Nominal data has categories without any inherent order, while ordinal data has categories with a defined order.

Q8. **Plot for Displaying Data in Terms of Range:** A box plot (also known as a box-and-whisker plot) can be used to display data in terms of range. It visually represents the distribution of a dataset by showing the median, quartiles, and range of the data.

Q9. **Descriptive vs. Inferential Statistics:**

- Descriptive Statistics: Descriptive statistics summarize the key features of a dataset, such as mean, median, and standard deviation. For example, calculating the average age of students in a class.
- Inferential Statistics: Inferential statistics make inferences or predictions about a population based on a sample of data. For instance, using the results from a survey to make predictions about the preferences of a larger population.

Q10. **Measures of Central Tendency and Variability:**

- Measures of Central Tendency: Common measures include the mean, median, and mode. The mean is the average value, the median is the middle value when the data is ordered, and the mode is the most frequently occurring value. These measures provide a summary of the center of a dataset.
- Measures of Variability: Common measures include the range, variance, and standard deviation. The range is the difference between the highest and lowest values, while variance and standard deviation measure the spread or dispersion of the data points around the mean. These measures provide information about the spread of the data points.