1)What are the three measures of central tendency?

Ans- There are three main measures of central tendency:

mode.,median.,mean.

2) What is the difference between the mean, median, and mode? How are they used to measure the central tendency of a dataset?

Ans- The 3 most common measures of central tendency are the mean, median and mode. The mode is the most frequent value. The median is the middle number in an ordered data set. The mean is the sum of all values divided by the total number of values.

3)Measure the three measures of central tendency for the given height data:

[178,177,176,177,178.2,178,175,179,180,175,178.9,176.2,177,172.5,178,176.5]

Ans-

Mean – 177.01

Median – 177

Mode - 177

4)Find the standard deviation for the given data:

[178,177,176,177,178.2,178,175,179,180,175,178.9,176.2,177,172.5,178,176.5]

Ans- The standard deviation is 1.87

5) How are measures of dispersion such as range, variance, and standard deviation used to describe the spread of a dataset? Provide an example.

Ans- Measures of dispersion describe the spread of the data. They include the range, interquartile range, standard deviation and variance. The range is given as the smallest and largest observations. This is the simplest measure of variability.

6) What is a Venn diagram?

Ans- A Venn diagram uses overlapping circles or other shapes to illustrate the logical relationships between two or more sets of items. Often, they serve to graphically organize things, highlighting how the items are similar and different.

7) For the two given sets A = (2,3,4,5,6,7) & B = (0,2,6,8,10). Find:

(i) A B

(ii) A ⋃ B

Ans- (i) – {2,6}

(ii)- {0,2,3,4,5,6,7,8,10}

8) What do you understand about skewness in data?

Ans- Skewness is a measurement of the distortion of symmetrical distribution or asymmetry in a data set. Skewness is demonstrated on a bell curve when data points are not distributed symmetrically to the left and right sides of the median on a bell curve.

9)If a data is right skewed then what will be the position of median with respect to mean?

Ans- f the distribution of data is skewed to the right, the mode is often less than the median, which is less than the mean.

10) Explain the difference between covariance and correlation. How are these measures used in statistical analysis?

Ans- Covariance is an indicator of the extent to which 2 random variables are dependent on each other. A higher number denotes higher dependency. Correlation is a statistical measure that indicates how strongly two variables are related. The value of covariance lies in the range of -∞ and +∞.

Covariance is calculated by analyzing at-return surprises (standard deviations from the expected return) or multiplying the correlation between the two random variables by the standard deviation of each variable.

11) What is the formula for calculating the sample mean? Provide an example calculation for a dataset.

Ans- The general sample mean formula for calculating the sample mean is expressed as x̄ = ( Σ xi ) ÷ n. Here, x̄ denotes the average value of the samples or sample mean, xi refers all X sample values and 'n' stands for the number of sample terms in the given data.

E.g - The mean of the following data [178,177,176,177,178.2,178,175,179,180,175,178.9,176.2,177,172.5,178,176.5]

is 177.01

12) For a normal distribution data what is the relationship between its measure of central tendency?

Ans-Any normal distribution has a graph that is perfectly symmetric about a vertical line through its peak. Therefore, all measures of central tendency (most commonly, the mean, median, and mode) give the same answer: the x -value of the peak.

13) How is covariance different from correlation?

Ans- Covariance and correlation are two terms that are opposed and are both used in statistics and regression analysis. Covariance shows you how the two variables differ, whereas correlation shows you how the two variables are related.

14) How do outliers affect measures of central tendency and dispersion? Provide an example.

Ans- Outliers are numbers in a data set that are vastly larger or smaller than the other values in the set. Mean, median and mode are measures of central tendency. Mean is the only measure of central tendency that is always affected by an outlier.