Frequently Asked Questions

1. What is Dispersion?

Answer: The measures of dispersion are important for describing the spread of the data, or its variation around a central value.

2. What do you mean by absolute and relative measures of dispersion?

Answer: Absolute Measures of Dispersion: The absolute measures of dispersion can be compared with one another only if the two belong to the same population and are expressed in the same units like inches, rupees etc.

Relative Measures of Dispersion: The relative measures of dispersion can be found only by calculating.

3. What are the types of dispersion?

Answer: There are four types of dispersion:

- Range
- Inter quartile range
- Mean deviation
- Standard Deviation
- 4. What is range and give the formula for range with example.

Answer: The range is the difference between the maximum value and the minimum value of data.

If A is 30 and B is 10 in a distribution, then range is given by:

Range is $X_{max} - X_{min}$ That is, Range is A-B. 30-10 = 20.

5. What do you mean by semi inter quartile range?

Answer: The semi-inter quartile range (SIR) or quartile deviation is defined as the difference of the third and the first quartiles divided by two.

6. What are the merits of mean deviation?

Answer: Merits are:

- · Simple to understand and easy to calculate
- Each and every item in the distribution is taken in consideration
- · Less affected by the value of extreme items
- 7. What is standard deviation?

Answer: Standard deviation is the positive square root of the arithmetic mean of the squares of the deviation given from their arithmetic mean.

8. What is the formula of standard deviation for grouped data and for ungrouped data?

Answer: Standard deviation for grouped data is: $S = C \sqrt{\frac{\sum fx^2}{N}} - \left(\frac{\sum fx}{N}\right)^2$ Standard deviation for ungrouped data is: $\sigma = \sqrt{\frac{\sum (x_i - \overline{x})^2}{N}}$

9. What do you mean by variance? Give the formula.

Answer: The Square of standard deviation is called as variance.

Formula is:
$$\sigma^2 = \frac{\sum (x)}{\sum (x)}$$

10. What is coefficient of dispersion?

Answer: Whenever we want to compare the variability of the two series which are in different units, we will use coefficient of dispersion. It is pure numbers independent of the units of measurement.

11. What is the formula for Coefficient of dispersion based on quartile deviation?

C.D = <u>mean deviation</u> average from which it is calculated

12. What are the demerits of quartile deviation?

Answer: Demerits are:

- It fails to cover all the items in a distribution
- · It is not suitable for further mathematical treatment
- It varies from sample to sample based on the same population

13. What is the main purpose of dispersion?

Answer: Purpose of dispersion is:

- It is one of the most important quantities used to characterize a frequency distribution.
- It affords a basis of comparison between two or more frequency distributions.

14. Find the mean deviation from the following set of data: 10, 20, 30, 40, 50

Answer: Formula for mean deviation is:

$$MD = \frac{\sum \left| x_i - \bar{x} \right|}{N}$$

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Numbers (N)	Data (xi)	$\frac{1}{x}$	$x_i - \overline{x}$	$\sum x_i - \overline{x}$
1	10	30	10-30 = -20	20
2	20	30	20-30 = -10	10
3	30	30	30-30 = 0	0
4	40	30	40-30 = 10	20
5	50	30	50-30 = 20	10
N = 5	$\frac{1}{x}$ =150		0	60

N=5, xi =150 Thus, \overline{x} =150/5 = 30

Here, $\sum \left| x_i - \overline{x} \right| = 60$, N = 5 60/5 = 12. Thus, mean deviation is 12.

15. What is the formula for Coefficient of dispersion based on mean deviation?

$$C.D = \frac{(Q3 - Q1)/2}{(Q3 + Q1)/2} = \frac{(Q3 - Q1)}{(Q3 + Q1)}$$

Answer: Formula is: