

Statistics — Assignment 1

Class 11 Maths · Topic-wise question bank covering every concept of the chapter · Narayan Gurukul Academy

Instructions: (1) Attempt all questions. This worksheet walks through every concept of the chapter, topic by topic.
 (2) The interactive MCQ version of these questions (with instant answer reveal) is available on the notes page.
 (3) Universal values: $g = 10 \text{ m/s}^2$ unless stated. Give answers with correct SI units.

Range and Measures of Dispersion

MCQ Questions (choose the correct option)

1. The range of a data set is
 - (A) the difference between the maximum and minimum values
 - (B) the average of the values
 - (C) the middle value
 - (D) the most frequent value
2. Measures of dispersion include
 - (A) range, mean deviation, variance and standard deviation
 - (B) mean, median and mode
 - (C) only the mean
 - (D) only the range
3. The range of the data 5, 8, 2, 11, 7 is
 - (A) 9
 - (B) 11
 - (C) 6
 - (D) 3
4. A measure of dispersion describes
 - (A) how spread out the data is
 - (B) the central value only
 - (C) the total sum
 - (D) the number of items

1 Mark Questions

1. Define the range of a data set.
2. Name any three measures of dispersion.
3. Find the range of 5, 8, 2, 11, 7.

2 Mark Questions

1. Find the range of the data 12, 6, 15, 9, 20, 4.
2. Why are measures of dispersion needed along with averages?

3 Mark Questions

1. Find the range and coefficient of range of the data 25, 30, 18, 42, 35.
2. Explain, with an example, why two data sets with the same mean can have different dispersions.

Mean Deviation for Ungrouped Data

MCQ Questions (choose the correct option)

- Mean deviation about the mean is
 - $(\sum |x_i - \bar{x}|)/n$
 - $\sum (x_i - \bar{x})/n$
 - $\sum x_i/n$
 - $\sum x_i^2/n$
- Mean deviation about the median uses
 - median
 - mean
 - mode
 - range
- The mean deviation about the mean of 2, 4, 6, 8 is
 - 1.5
 - 2
 - 5
 - 3
- Mean deviation is always
 - non-negative
 - negative
 - zero
 - positive only for odd n

1 Mark Questions

- Write the formula for mean deviation about the mean.
- Write the formula for mean deviation about the median.
- Find the mean deviation about the mean of 2, 4, 6, 8.

2 Mark Questions

- Find the mean deviation about the mean of 6, 8, 10, 12.
- Find the mean deviation about the median of 3, 5, 7, 9.

3 Mark Questions

- Find the mean deviation about the mean of 15, 18, 20, 22, 25.
- Find the mean deviation about the median of 12, 15, 18, 20, 25, 30.

Mean Deviation for Grouped Data

MCQ Questions (choose the correct option)

- For grouped data, mean deviation about the mean is
 - $(\sum f_i |x_i - \bar{x}|)/N$
 - $\sum f_i x_i/N$
 - $\sum f_i/N$
 - $\sum x_i f_i^2/N$
- In grouped data, x_i usually denotes the

- (A) midpoint of a class
 - (B) lower limit
 - (C) upper limit
 - (D) frequency
3. N in grouped-data formulas is
- (A) $\sum f_i$
 - (B) $\sum x_i$
 - (C) $\sum f_i x_i$
 - (D) f_i
4. Mean deviation for grouped data accounts for
- (A) the frequency of each class
 - (B) only the class size
 - (C) only the midpoints
 - (D) only the range

1 Mark Questions

1. Write the formula for mean deviation about the mean for grouped data.
2. What does x_i denote in grouped data?
3. What is N in the grouped-data formula?

2 Mark Questions

1. For the classes 0–10, 10–20, 20–30 with frequencies 2, 3, 5, write the midpoints.
2. Find the mean of the grouped data with midpoints 5, 15, 25 and frequencies 2, 3, 5.

3 Mark Questions

1. Find the mean deviation about the mean for the data with classes 0–10, 10–20, 20–30 and frequencies 2, 3, 5.
2. Find the mean deviation about the median for the grouped data with midpoints 10, 20, 30, 40 and frequencies 4, 6, 8, 2.

Variance and Standard Deviation

MCQ Questions (choose the correct option)

1. Variance is defined as
 - (A) the mean of the squared deviations from the mean
 - (B) the mean of the deviations
 - (C) the square root of the mean
 - (D) the range squared
2. Standard deviation is
 - (A) the positive square root of the variance
 - (B) the square of the variance
 - (C) the mean of deviations
 - (D) twice the variance
3. The variance of 2, 4, 6, 8 is
 - (A) 5
 - (B) $\sqrt{5}$

- (C) 25
 - (D) 10
4. The standard deviation has the same units as
- (A) the original data
 - (B) the variance
 - (C) the mean squared
 - (D) the number of items

1 Mark Questions

1. Define variance.
2. Define standard deviation.
3. Find the variance of 2, 4, 6, 8.

2 Mark Questions

1. Find the standard deviation of 4, 6, 8, 10.
2. Find the variance of 5, 10, 15.

3 Mark Questions

1. Find the variance and standard deviation of 6, 8, 10, 12, 14.
2. Find the variance and standard deviation of 3, 7, 11, 15.

Short-Cut and Step-Deviation Method

MCQ Questions (choose the correct option)

1. The short-cut method for variance uses deviations from
 - (A) an assumed mean
 - (B) the median
 - (C) the mode
 - (D) zero
2. In the step-deviation method, $d_i =$
 - (A) $(x_i - A)/h$
 - (B) $x_i - A$
 - (C) x_i / h
 - (D) $x_i - \bar{x}$
3. The short-cut method simplifies calculation when the data values are
 - (A) large
 - (B) small
 - (C) equal
 - (D) zero
4. The step-deviation method is useful for
 - (A) grouped data with equal class sizes
 - (B) ungrouped data only
 - (C) single values
 - (D) the range

1 Mark Questions

1. What is an assumed mean?
2. Write d_i for the step-deviation method.
3. When is the short-cut method preferred?

2 Mark Questions

1. Using an assumed mean of 10, write the deviations of 6, 8, 12, 14.
2. For classes of width 10 and assumed mean A, write d_i for a midpoint 35.

3 Mark Questions

1. Using the short-cut method with assumed mean 10, find the variance of 6, 8, 10, 12, 14.
2. Using the step-deviation method with $A = 25$ and $h = 10$, find the variance of the data with midpoints 15, 25, 35 and frequencies 2, 3, 5.

Combined Mean, Variance and Coefficient of Variation

MCQ Questions (choose the correct option)

1. The coefficient of variation is
 - (A) $(\text{standard deviation}/\text{mean}) \times 100$
 - (B) $(\text{mean}/\text{standard deviation}) \times 100$
 - (C) $\text{variance} \times 100$
 - (D) $\text{mean} \times 100$
2. The combined mean of two groups depends on
 - (A) the means and sizes of the groups
 - (B) only the means
 - (C) only the sizes
 - (D) the ranges
3. The coefficient of variation is used to compare
 - (A) the consistency of two distributions
 - (B) the totals
 - (C) the medians
 - (D) the ranges
4. A smaller coefficient of variation indicates
 - (A) greater consistency
 - (B) greater spread
 - (C) a larger mean
 - (D) a larger range

1 Mark Questions

1. Write the formula for the coefficient of variation.
2. What does the combined mean depend on?
3. Which distribution is more consistent: one with a smaller or larger coefficient of variation?

2 Mark Questions

1. Find the combined mean of two groups with $n_1 = 10$, $\bar{x}_1 = 20$ and $n_2 = 15$, $\bar{x}_2 = 30$.
2. Find the coefficient of variation given mean 50 and standard deviation 5.

3 Mark Questions

- Two groups have means 40 and 60 with sizes 20 and 30. Find the combined mean.
- Given mean 25 and standard deviation 5, find the coefficient of variation and comment on consistency if another distribution has CV 25%.

Comparing Two Distributions

MCQ Questions (choose the correct option)

- Distributions are usually compared using
 - the coefficient of variation
 - the mean only
 - the range only
 - the total
- A distribution with a lower coefficient of variation is
 - more consistent
 - more variable
 - larger in mean
 - smaller in range
- The coefficient of variation is a
 - relative measure of dispersion
 - absolute measure
 - measure of central tendency
 - measure of skewness
- If two distributions have the same mean, the one with smaller standard deviation is
 - more consistent
 - less consistent
 - identical
 - undefined

1 Mark Questions

- Which measure is used to compare the consistency of two distributions?
- Is the coefficient of variation a relative or absolute measure?
- If two distributions have the same mean, which is more consistent?

2 Mark Questions

- Distribution A: mean 60, SD 6. Find its coefficient of variation.
- Two distributions have CVs 10% and 15%. Which is more consistent?

3 Mark Questions

- Compare two distributions: A has mean 50, SD 5; B has mean 40, SD 8. Which is more consistent?
- The coefficient of variation of distribution A is 12% and of B is 18%. Interpret which distribution is more consistent and why.