Unit 11 · Statistics

HARDER WORKSHEET

Full marks 26

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 26

1 Multiple choice [3]

Choose the correct option for each of the following questions.

i. Every value of a data set is multiplied by 3. What happens to its coefficient of variation? [1]

a. it is multiplied by 3 **b.** it is multiplied by 9

c. it does not change **d.** it is divided by 3

ii. A data set has a mean of 50 and a C.V. of 10%. Then 10 is added to every value. What is the new C.V.? [1]

a. 10% **b.** 20%

c. 8.33% **d.** 12%

iii. In a box plot, the median line is much nearer Q_1 than Q_3. What must be true? [1]

a. the mean equals the median

b. the values in the third quarter are more spread out than those in the second

c. there are more values between the median and Q_3 than between Q_1 and the median

d. the smallest value is 0

2 Short answers [13]

Write short answers to the following questions.

a. The mean of the four numbers 2, 4, 6 and x is 5. [3]

a. Find x.

b. Find the standard deviation.

c. Find the coefficient of variation.

b. One frequency in the table is missing. The mean is 19. **[3]**

Marks	**0–10**	**10–20**	**20–30**	**30–40**
Students	4	k	6	4

a. Find k.

b. Find the standard deviation.

c. Is the report possible? For one set of marks, a student reports a mean deviation (from the mean) of 12 and a standard deviation of 10. Could both be right? Give a reason. **[2]**

d. Show that the standard deviation of two numbers a and b is half the distance between them, $\sigma = \frac{|a-b|}{2}$. **[3]**

e. Two vegetable sellers at a market keep a record of their daily earnings. Sita earns Rs 1,500 a day on average, with a standard deviation of Rs 300; Gita Rs 2,200, with a standard deviation of Rs 400. Whose earnings are steadier? Show why. **[2]**

3 Long answers [8]

Solve the following problems. Show your working.

a. The monthly rents of 40 rooms in a town are: [4]

Rent (Rs, more than)	4,000	6,000	8,000	10,000	12,000
Rooms	40	34	22	10	3

The highest rent is under Rs 14,000.

a. Make a table of the classes and their frequencies.
b. Find the mean rent.
c. Find the standard deviation.
d. Find the coefficient of variation.

Answer: _____

b. Make your own data. [4]

a. Write five marks whose mean is 50 and whose standard deviation is exactly 10. Check both.
b. Find the mean deviation of your marks and show that it is less than 10.
c. A sixth student scores 50. Find the new standard deviation.
d. Explain why it went down, although nothing about the old marks changed.

4 Think [2]

Think, then answer.

A survey of household incomes in a village ends with the class “Rs 1,00,000 a month or more”. Which measure of dispersion would you use, and why? Would the standard deviation be a good choice even if the top class were closed?