Chapter 7 – Measures of Dispersion

Question 1

Evaluate the range and coefficient of the following series, that shows the monthly expenditure of seven students: 20, 32, 32, 49, 22, 31, 37

Answer:

Given:

Highest Value (H) =49

Lowest Value (L) =20

Range = Highest Value − Lowest Value

R= 49 − 20 = 29

$$\text{Coefficient of Range} = \frac{H-L}{H+L} = \frac{49-20}{49+20} = \frac{29}{69} = 0.42$$

Hence, the range is 29 and coefficient of range is 0.42

Question 2

Find range and coefficient of range from the weekly wage From the weekly wages of 8 labours of a workshop: 100, 120, 122, 138, 166, 185, 175, 155.

Answer:

Given:

Highest Value (H) = 185

Lowest Value (L) = 100

Range = Highest Value − Lowest Value

R= 185 − 100 = 85

$$\text{Coefficient of Range} = \frac{H-L}{H+L} = \frac{185-100}{185+100} = \frac{85}{285} = 0.29$$

Thus, range is 85 and coefficient of range is 0.29

Question 3

From the following data calculate range and coefficient of range:

Marks	15	25	35	45	55	65	75
No. of Studends	9	11	8	35	20	7	4

Answer:

Marks	**No. of Students**
15	9
25	11
35	8
45	35
55	20
65	7
75	4

Highest value (H) = 75

Lowest value (L) = 15

Range = Highest value − Lowest value

or, R = 75 − 15= 60 marks

$$\text{Coefficient of Range} = \frac{H-L}{H+L} = \frac{75-15}{75+15} = \frac{60}{90} = 0.66$$

Hence, range is 60 and coefficient of range is 0.66

Question 4

Find out range and coefficient range.

Marks	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of Students	8	10	9	30	25	6	5

Answer:

Marks	**No. of Students**
20-30	8

30-40	10
40-50	9
50-60	30
60-70	25
70-80	6
80-90	5

Range = Upper limit of the highest class interval − Lower limit of the lowest class intervalor, Range = 90 − 20 = 70

$$\text{Coefficient of Range} = \frac{H-L}{H+L} = \frac{90-20}{90+20} = \frac{70}{110} = 0.63$$

Hence, the range is 70 marks and coefficient of range is 0.63

Question 5

Evaluate out range and coefficient of range of the marks.

Marks	5−9	10−14	15−19	20−24	25−29	30−34
No. Students	4	6	3	2	6	4

Answer:

To get the range and its coefficient, first we have to convert inclusive class intervals into exclusive class intervals.

Class Interval	Exclusive Class Interval	Frequency
5 − 9	4.5 − 9.5	4
10 −14	9.5 − 14.5	6
15 −19	14.5 − 19.5	3
20 −24	19.5 − 24.5	2
25 −29	24.5 − 29.5	6
30− 34	29.5 − 34.5	4

Range = Upper limit of the highest class interval − Lower limit of the lowest class intervalor, Range = 34.5 − 4.5 = 30

$$\text{Coefficient of Range} = \frac{H-L}{H+L} = \frac{34.5-4.5}{34.5+4.5} = \frac{30}{39} = 0.769$$

Hence, the range is 730 marks and coefficient of range is 0769.