UNIT 3: Correlation and Regression

1. Calculate the coefficient of correlation from the following data:

X	12	9	8	10	11	13	7
Y	14	8	6	9	11	12	3

2. Calculate the correlation coefficient between the following values of demand and the corresponding price of a commodity:

Demand In Quintals	11	13	15	16	18	19	20	21
Price in Rs. Per kg	20	19	22	24	25	21	23	18

3. Calculate the correlation coefficient from the following data

X	3	7	8	9	10	11	13	15	16	19
Y	18	12	13	14	15	16	15	14	10	12

4. Calculate Karl Pearson's coefficient of correlation for the data given below:

X	0	4	8	12	16	20
Y	8	12	14	16	18	21

5. The ICC ranking for ODI and test matches for nine team as shown bellows
   Check whether there is correlation between ranks

Teams	Ind	Aus	SA	SRI	PAK	ENG	NZ	BNG	WI
Test Rank	1	2	3	4	5	6	7	8	9
ODI rank	1	3	2	7	6	4	5	8	9

6. Ten students got the following percentage of mark in mathematics and physics:

Maths(x)	8	36	98	25	75	82	92	62	65	35
Phy(y)	84	51	91	60	68	62	86	58	35	49

   Find the rank correlation coefficient.

7. Ten competitors in a musical test were ranked by three judges a, b and c in the following order. Using the rank correlations method ,find which pair of judges has nearest approach to common liking in music

Rank by a	1	6	5	10	3	2	4	9	7	8
Rank by b	3	5	8	4	7	10	2	1	6	9
Rank by c	6	4	9	8	1	2	3	10	5	7

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8. Given $n = 10$, $\sigma_x = 5.4$, $\sigma_y = 6.2$ and sum of the product of deviations from the mean of x and y is 66. Find the correlation coefficient.

9. If two lines of regression are $4x - 5y + 30 = 0$ and$20x - 9y - 107 = 0$, which of these lines of regression of x on y and y on$x$? Find r_{xy} and σ_y when $\sigma_x = 3$.

10. The regression lines of a sample are $x + 6y = 6$ and $3x + 2y = 10$. Find
    (1) sample means $\bar{x}$ and $\bar{y}$, and
    (2) the coefficient of correlation between x and y.
    (3) Also estimate y when $x = 12$.

11. For a bivariate data, the mean value of x is 20 and the mean value of y is 45. The regression coefficient of y on x is 4 and that of x on y is$\frac{1}{9}$. Find
    a) The coefficient of correlation
    b) the standard deviation of x if the standard deviation of y is 12.
    c) also write down the equation of regression lines.

12. Find the regression coefficient of y on x for the following data:

x	1	2	3	4	5
y	160	180	140	180	200

13. Obtain the two regression lines from the following data and hence, find the correlation coefficient.

x	6	2	10	4	8
y	9	11	5	8	7

14. From the following data obtain the two regression lines and correlation coefficient.

Sales(x)	100	98	78	85	110	93	80
Purchase(y)	85	90	70	72	95	81	74