PARUL UNIVERSITYs
FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES
4th SEMESTER B. TECH PROGRAMME
PROBABILITY, STATISTICS AND NUMERICAL METHODS (303191251)
ACADEMIC YEAR 2024-25
UNIT: 1 CORRELATION, REGRESSION ANDCURVE FITTING

TUTORIAL-1

1 Calculate the correlation coefficient between the following data

X	4	8	10	12	16	22
Y	10	12	14	16	18	19

2 Calculate the correlation coefficient between the following data.

X	21	40	50	60	80	110
Y	80	63	62	25	35	50

3 Given n = 10, σ_x = 25.20, σ_y = 16.2, and sum of the product of deviations from the mean of x and y is 85. Find the correlation coefficient.

4 Given n = 10, σ_x = 10.8, σ_y = 12.4, and sum of the product of deviations from the mean of x and y is 132. Find the correlation coefficient.

5 Two judges have given ranks to 10 students for their honesty. Find the rank correlation coefficient of the following data:

1ST Judge	3	5	8	4	7	10	2	1	6	9
2nd Judge	6	4	9	8	1	2	3	10	5	7

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

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

Find the rank correlation coefficient.

7 Find the Coefficient of rank correlation of the following data:

x	45	45	47	48	45	58	59	54	46	60
y	107	106	102	103	43	106	103	97	100	100

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

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

9 The following information is obtained for two variables x and y. Find regression equation of y on x. n=10;$\sum x = 130; \sum x^2 = 2288; \sum xy = 3467$.

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

11 The regression lines of a sample are $x + 6y = 6$ and $3x + 2y = 10$. Find
(a) Sample means $\bar{x}$ and $\bar{y}$, and
(b) the coefficient of correlation between x and y.

(c) Also estimate y when $x = 12$.

12 From the following data, draw a scatter diagram and state the type of correlation between the variables X and Y.

X	1	2	3	4	5
Y	5	10	15	20	25

13 Fit a straight line to the following data:

x	10	20	30	40	60	80
y	24	30	36	40	50	60

14 Fit a straight line to the following data. Also, estimate the value of y at $x = 2.5$

x	0	1	2	3	4
y	1	1.8	3.3	4.5	6.3