increases (decreases); (ii) they are inversely proportional, i.e. when one increases (decreases) the other decreases (increases); (iii) no relation. These three situations can be stated as follows statistically (i) positively correlated (ii) negatively correlated (iii) no-correlation.

SCATTER DIAGRAM

It is the simplest way of the diagrammatic representation of bivariate data. Let X and Y be the two variables under study with n observation each. If we plot $(X_1, Y_1), (X_2, Y_2), \dots, (X_n, Y_n)$ on a graph sheet, the resulting diagram gives us a vague idea about the correlation between these two variables X and \therefore



Fig 1 represents that there is a positive correlation between the variables *X* and *Y*.

S.D 2 4

r = 0.8Find the two regression equations

Solution

Regression equation Y on X

 $b_{yx} = r \cdot \frac{\sigma_y}{\sigma_x} = 0.8 \times \frac{2}{4} = 0.4$ $(Y - \bar{Y}) = b_{\nu x} \left(X - \bar{X} \right)$ (Y - 10) = 0.4(X - 15)Y - 10 = 0.4X + 10 - 6 $\int_{\sigma_x} = 0.8 \times \frac{4}{2} = 1.6$ $(X - \bar{X}) = b_{yx}(Y - FEN)$ (X - 1.F = 1.6(Y - 10) K = 1.6Y - 16 + 15 K - 1Y = 0.4X + 10 - 6X = 1.6Y - 1Example Find the regression equation for the following *X*: 2 4 6 8 *Y* : 25 10 20 30 Solution

Regression equation

$$X Y d_x = X - 5 d_y d_x^2 d_y^2 d_{y}^2 d_{xy}$$

11. Calculate the regression equation for the following data and also compute Karl Pearson's coefficient of correlation:

No. of students (X):	800	600	900	700	500	400
No. of Passed (Y) :	480	300	450	560	450	310

12. To study the effect of rain on yield of wheat the following results were obtained.

	Mean	S.E
Yield (X) :	800	12
Rainfall(Y):	50	2

r = +0.80

Estimate the yield when the rainfall is 80 inches.

13. Find the two regression equations, regression co-efficient of correlation from the following figures. $\sum X = 120$, $\sum Y = 432$, $\sum XY = 4992$, $\sum X^2 = 1394$, $\sum Y^2 = 18,252$, and n = 12

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