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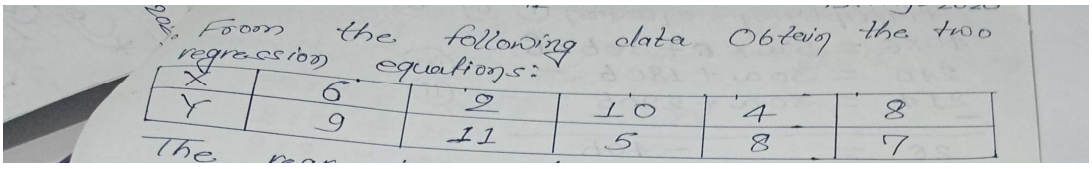
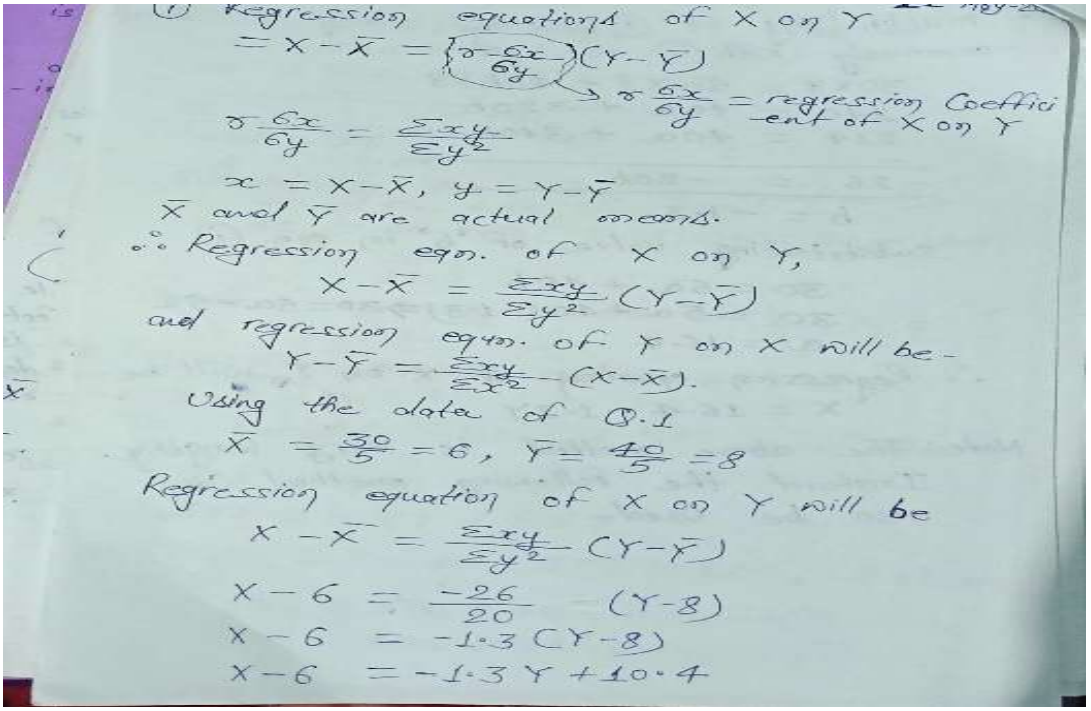
Class: B.A. Economics (Part-III)
Paper: 08
Topic- Numerical of Regression


From the following data Obtain the two regression equations:

X	6	2	10	4	8
Y	9	11	5	8	7

The


(1) Regression equations of X on Y

$X - \bar{X} = r\frac{\sigma_x}{\sigma_y}(Y - \bar{Y})$

$r\frac{\sigma_x}{\sigma_y}$ = regression Coefficient of X on Y

$r\frac{\sigma_x}{\sigma_y} = \frac{\Sigma xy}{\Sigma y^2}$

$x = X - \bar{X}$, $y = Y - \bar{Y}$

$\bar{X}$ and $\bar{Y}$ are actual means.

∴ Regression eqn. of X on Y,

$X - \bar{X} = \frac{\Sigma xy}{\Sigma y^2}(Y - \bar{Y})$

and regression eqn. of Y on X will be-

$Y - \bar{Y} = \frac{\Sigma xy}{\Sigma x^2}(X - \bar{X})$.

Using the data of Q.1

$\bar{X} = \frac{30}{5} = 6$, $\bar{Y} = \frac{40}{5} = 8$

Regression equation of X on Y will be

$X - \bar{X} = \frac{\Sigma xy}{\Sigma y^2}(Y - \bar{Y})$

$X - 6 = \frac{-26}{20}(Y - 8)$

$X - 6 = -1.3(Y - 8)$

$X - 6 = -1.3Y + 10.4$

$X = 16.4 - 1.3Y$

Regression equation of Y on X will be-

$$Y - \bar{Y} = \frac{\Sigma xy}{\Sigma x^2}(X - \bar{X})$$

$$Y - 8 = \frac{-26}{40}(X - 6)$$

$$Y - 8 = -0.65X + 3.9$$

$$Y = 11.9 - 0.65X$$

The two equations are $X = 16.4 - 1.3Y$ and $Y = 11.9 - 0.65X$.