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Question: : 3(a) : If $\bar{x}=18$, $\bar{y}=100$, $\sigma_x = 14$, $\sigma_y = 20$ and correlation coefficient $r_{xy} = 0.8$, find the regression equation of y and x .

Solution: :

Given : $\bar{x}=18$, $\bar{y}=100$, $\sigma_x = 14$, $\sigma_y = 20$, $r_{xy} = 0.8$

$$b_{yx} = r \times \frac{\sigma_y}{\sigma_x} = 0.8 \times \frac{20}{14} = \frac{8}{7}$$

The Regression equation y on x is :

$$y - \bar{y} = b_{yx}(x - \bar{x}) \quad (1)$$

$$\Rightarrow y - 100 = \frac{8}{7}(x - 18)$$

$$\Rightarrow 7y - 700 = 8x - 144$$

$$8x - 7y + 556 = 0 \quad (2)$$

$\therefore 8x - 7y + 556 = 0$ is the regression equation.

