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Shivlal

Tutorial sheet:

Q1: Calculate Linear regression Coefficients from the following

x :	1	2	3	4	5	6	7	8
y :	3	7	10	12	14	17	20	24

Ans → : $b_{yx} = 2.7976$ and $b_{xy} = 0.3540$

Q(2) From the following data. Find the most likely value of y when $x = 24$

	y	x
Mean	985.4	18.1
S.D	36.4	2.0

and $r = 0.58$

Ans, $y = 10.556x + 794.73$, $y = 1048$ (Approx)

Q(3) The equations of two regression lines, obtained in a Correlation analysis of 60 observations are

$5x = 6y + 24$ and $1000y = 768x - 3608$

What is the Coeff. of Correlation and what is the ratio of variances of x and y.

Ans → : $r = 0.96$ and $\frac{\sigma_x}{\sigma_y} = \frac{5}{4}$

Q4):

A panel of two Judges, A and B, graded seven T.V. serial performances by awarding marks independently as shown in the following table:

performance :	1	2	3	4	5	6	7
marks by A :	46	42	44	40	43	41	45
marks by B :	40	38	36	35	39	37	41

The Eighth T.V performance which Judge B could not attend, was awarded 37 marks by Judge A. If the Judge B had also been present, How many marks would be expected to have been awarded by him to the eighth T.V performances.

Ans → (33.5) marks.

Q(5) → Two lines of regression are given by

$x + 2y - 5 = 0$ and $2x + 3y - 8 = 0$ and $\sigma_x^2 = 12$

Calculate

(i) The mean value of x and y

(ii) variance of y (iii) The coeff. of Correlation b/w x and y

Ans ⇒ (i) $\bar{x} = 1$, $\bar{y} = 2$ (ii) 4 (iii) $-\frac{\sqrt{3}}{2}$

Q.6 The means of a bivariate freq. distribution are at (3,4) and $r = 0.4$. The line of regression of y on x is parallel to the line $y = x$. Find the two lines of regression and Estimate value of x when $y = 1$

Q.7. Given $N = 50$, mean of $y = 44$
variance of x is $\frac{9}{16}$ of the variance of y
Regression eq^n of x on y is $3y - 5x = -180$
Find (i) mean of x
(ii) Coeff. of correlation b/w x and y.

Ans → (i) 62.4 (ii) 0.8 Ans

Q.8. For an army Persons of Strength 25, the regression of Weight of Kidneys (y) on weight of Heart (x), both measured in ounces is $y - 0.399x - 6.934 = 0$ and the regression of Weight of heart on Weight of Kidney is $x - 1.212y + 2.461 = 0$, Find the correlation Coeff. b/w x and y. Can you find the S.D of x and y.

Ans: $r = 0.7$, $\bar{x} = 11.5086$, $\bar{y} = 11.5261$,
σ_x and σ_y, ... ↑