Seat No. : _____

JH-104

January-2024

B.Com., Sem.-I

Major-DSC-C-STA-112 : Business Statistics

Time : 2 Hours] **[Max. Marks : 50**

Instructions : (1) Figures on right indicate marks of the question.
(2) Use of simple calculator is allowed.

Note : Each question carries **10** marks.

1. (a) Define Correlation coefficient. Explain scatter diagram method. **5**

(b) For the following data, obtain Rank Correlation Coefficient : **5**

X	67	62	50	60	50	45	42	68	62	64
Y	80	80	65	80	40	65	40	60	64	62

OR

1. (a) Find out Karl Pearson's coefficient of correlation from the following data : **5**

X	25	26	27	27	28	29	30	31	32	35
Y	103	102	105	107	108	111	110	113	115	116

(b) Explain the terms :

(i) Probable error

(ii) Coefficient of determination **5**

2. (a) Define regression coefficient. State properties of it. **5**

(b) Obtain two regression lines on the basis of the following information : **5**

Particulars	**Variable X**	**Variable Y**
Mean	40	45
Standard Deviation	10	09
Correlation Coefficient between X and Y is 0.5		

OR

2. (a) Find the regression line of y on x from the following data 5

	x		
y	20-25	25-30	30-35
16-20	9	13	–
20-24	7	11	4
24-28	–	–	6

(b) The equation of regression line for x on y is $3x + 2y - 45 = 0$ and if $x = 10$ then obtain the value of y and determine b_{xy}. 5

3. (a) Explain any one method of studying association. 5

(b) 800 students appeared in an examination. Among them 600 were boys and rest are girls. Total 650 students were successful and 160 girls were unsuccessful. Can this information be regarded as consistent ? 5

OR

3. (a) Determine the nature of association of two attributes A and B by comparing observed frequency and expected frequency. N = 500, (A) = 250, (Aβ) = 80, (β) = 160. 5

(b) Find Yule's coefficient of association if N = 2000, (A) = 800, (β) = 1200 and (AB) = 200. 5

4. (a) From the following data, obtain the regression line equation of x_1 on x_2 and x_3. Estimate the value of x_1 for $x_2 = 8$ and $x_3 = 10$. 5

$\sigma_1 = 3$ $\quad \sigma_2 = 4$ $\quad \sigma_3 = 4$

$r_{12} = 0.6$ $\quad r_{13} = 0.4$ $\quad r_{23} = 0.6$

$\bar{x_1} = 3$ $\quad \bar{x_2} = 4$ $\quad \bar{x_3} = 4$

(b) Write a short note on multiple regression model. 5

OR

4. (a) If $r_{12} = r_{13} = r_{23} = 0.6$ then find $r_{12.3}$ and $R_{1.23}$. 5

(b) Write the formula of multiple regression equation of x_2 on x_1 and x_3. Also write the formula of x_3 on x_1 and x_2. 5

5 Attempt any ten

(1) The value of r^2 lies between _____ and _____.

(a) 0 to 1 (b) −1 to 1

(c) −1 to 0 (d) None of these

(2) If the ranks of two variables x and y are exactly in same order then what is the value of Σd^2 ?

(a) 1 (b) 0

(c) −1 (d) None of these

(3) The correlation coefficient between two variables x and y is 0.6, hence the correlation coefficient r between $x + 0.2$ and $y + 0.2$ is _____

(a) 0.8 (b) 0.6

(c) 1.6 (d) None of these

(4) The regression coefficients of two series are $b_{yx} = -0.6$ and $b_{xy} = -0.6$, hence correlation coefficient r is _____

(a) 0.36 (b) −0.6

(c) 0.6 (d) −0.36

(5) The regression lines between two variables are perpendicular to each other, hence the correlation coefficient between them is

(a) −1 (b) 0

(c) 1 (d) ± 1

(6) The greater the angle between the regression lines for two variables, the correlation between the variables is _____.

(a) greater (b) lesser

(c) 0 (d) None of these

(7) When two attributes A and B are said to be independent from each other ?

(a) $(AB)(\alpha\beta) = (\alpha B)(a\beta)$ (b) $(AB)(\alpha\beta) > (\alpha B)(A\beta)$

(c) $(AB)(\alpha\beta) < (\alpha B)(a\beta)$ (d) None of these

(8) A and B are two attributes then $(AB) + (A\beta) = \ldots$

(a) (A) (b) (B)

(c) (β) (d) (α)