

# VISHESH ACADEMY OF COMMERCE

DSS-33, OLD COURT COMPLEX NEAR FAWARA CHOWK HISAR

## CA FOUNDATION

### TEST – CORRELATION AND REGRESSION

TIME: 1 Hrs.

Marks: 30

Q1. The coefficient of correlation  $r$  between  $x$  and  $y$  when:  $\text{Cov}(x, y) = -16.5$ ,  $\text{Var}(x) = 2.89$ ,  $\text{Var}(y) = 100$  is:

- (a) -0.97 (b) 0.97  
(c) 0.89 (d) -0.89

Q2. If the sum of squares of the rank difference in Mathematics and Physics marks of 10 students is 22, then the coefficient of rank correlation is:

- (a) 0.267 (b) 0.867  
(c) 0.92 (d) None

Q3. For the following data, the coefficient of rank correlation is:

Rank in Botany:	1	2	3	4	5
Rank in Chemistry:	2	3	1	5	4

- (a) 0.93 (b) 0.4  
(c) 0.6 (d) None

Q4. For 10 pairs of observations, number of concurrent deviations was found to be 4. What is the value of the coefficient of concurrent deviation?

- (a)  $\sqrt{0.2}$  (b)  $1/3$   
(c)  $-1/3$  (d)  $-\sqrt{0.2}$

Q5. The coefficient of correlation between  $x$  and  $y$  series from the following data:

	X series	Y series
Number of pairs of Observations	15	15
Arithmetic Mean	25	18
Standard Deviation	3.01	3.03
Sum of squares of dev. from mean	136	138

Sum of the product of the deviations of  $X$  and  $Y$  series from their respective means = 122, is :

- (a) 0.89 (b) 0.99  
(c) 0.69 (d) 0.91

Q6. If the sum of square of differences of rank is 50 and number of items is 8 then what the value of rank correlation coefficient is.

- (a) 0.59 (b) 0.40  
(c) 0.36 (d) 0.63

Q7. The coefficient of correlation is significant if:

- (a)  $r > 5P.E$  (b)  $r < 6P.E$   
(c)  $r \geq 6 \times P.E.$  (d)  $r = 6P.E$

Q8. Correlation coefficient between X and Y will be negative when:-

- (a) X and Y are decreasing (b) X is increasing, Y is decreasing  
(c) X and Y are increasing (d) None of these

Q9. If the rank correlation coefficient between marks in management and mathematics for a group of students is 0.6 and the sum of the squares of the difference in rank is 66. Then what is the number of students in the group?

- (a) 9 (b) 10  
(c) 11 (d) 12

Q10. If the correlation coefficient between X and Y is r, &  $U = \frac{X-5}{10}$  then  $r_{ux}$  is

- (a) r (b) -r  
(c)  $(r-5)/2$  (d)  $(r-7)/10$

Q11. If the sum of the product of deviations of x and y series from their mean is zero, then the coefficient of correlation will be

- (a) 1 (b) -1  
(c) 0 (d) None of these

Q12. In case 'Insurance Companies' Profits and the no. of claims they have to pay:

- (a) Positive correlation (b) Negative correlation  
(c) No correlation (d) None of these

Q13. If  $r = 0.6$  then the coefficient of non-determination is \_\_\_\_\_

- (a) 0.4 (b) -0.6  
(c) 0.36 (d) 0.64

Q14. Correlation coefficient between x and y is 1, then correlation coefficient between  $x - 2$  and  $(-y/2) + 1$  is.

- (a) 1 (b) -1  
(c)  $-1/2$  (d)  $1/2$

Q15. If the sum of the squares of Rank differences in the marks of 10 students in two subject is 44, then the coefficient of rank correlation is \_\_\_\_\_

- (a) 0.78 (b) 0.73  
(c) 0.87 (d) None

Q16. The coefficients of correlation between two variables X and Y is the simple \_\_\_\_\_ of the two regression.

- (a) Arithmetic Mean. (b) Geometric Mean.  
(c) Harmonic Mean. (d) None of the above

Q17. If 2 variables are uncorrelated, their regression lines are:

- (a) Parallel (b) Perpendicular  
(c) Coincident (d) Inclined at 45 degrees

Q18. Given :

$$\bar{X}=16, \sigma_x=4.8, \bar{Y}=20, \sigma_y=9.6$$

The coefficient of correlation between x and y is 0.6 . What will be the regression coefficient of 'x' on 'y' ?

- (a) 0.03 (b) 0.3  
(c) 0.2 (d) 0.05

Q19. If the sum of the product of deviations of x and y series from their mean is zero, then the coefficient of correlation will be

- (a) 1 (b) -1  
(c) 0 (d) None of these

Q20. For a bivariate data two lines of regression are  $40x - 18y = 214$  and  $8x - 10y + 66 = 0$ , then find the values of x and y

- (a) 17 and 13 (b) 13 and 17  
(c) 13 and -17 (d) -13 and 17

Q21. Out of the following which one affects the regression co-efficient?

- (a) Change of origin only  
(b) Change of scale only  
(c) Change of scale & origin both  
(d) Neither change of origin nor change of scale

Q22. \_\_\_\_\_ of the regression Coefficient is greater than the correlation coefficient

- (a) Combined mean (b) Harmonic mean  
(c) Geometric mean (d) Arithmetic mean.

Q23. The two regression line are  $7x - 3y - 18 = 0$  and  $4x - y - 11 = 0$ . Find the value of  $b_{yx}$  and  $b_{xy}$

- (a)  $7/3, 1/4$  (b)  $-7/3, -1/4$   
(c)  $-3/7, -1/4$  (d) None of them

Q24. Which of the following regression equations represent regression line of Y on X:

$$7x + 2y + 15 = 0, 2x - 4y + 10 = 0$$

- (a)  $7x + 2y + 15 = 0$  (b)  $2x + 5y + 10 = 0$   
(c) Both (a) and (b) (d) None of these

Q25. The two regression equations are:  $2x + 3y + 18 = 0$  and  $x + 2y - 25 = 0$  find the value of y if x = 9

- (a) -8 (b) 8  
(c) -12 (d) 0

Q26. The lines of regression are as follows:

$$5x - 14y = -10y; 14y - 208 = -8x. \text{ The mean values } (\bar{x}, \bar{y}) \text{ is:}$$

- (a) (12, 5) (b) (5, 7)  
(c) (7, 12) (d) (5, 12)

Q27. Given the regression equations as  $3x + y = 13$  and  $2x + 5y = 20$ . Find regression equation of y on x.

- (a)  $3x + y = 13$  (b)  $2x + Y = 20$   
(c)  $3x + 5y = 13$  (d)  $2x + 5y = 20$

Q28. The method applied for deriving regression equations is known as:

- (a) Concurrent deviation (b) Product moment  
(c) Least squares (d) Normal equation

Q29. The following data is given, based on 450 students for marks in Statistics and Economics at a certain examination:

$$\text{Mean marks in Statistics} = 40$$

$$\text{Mean marks in Economics} = 48$$

$$\text{S.D. of marks (Statistics)} = 12$$

$$\text{Variance of marks (Economics)} = 256$$

$$\text{Sum of the products of deviations of marks from their respective mean} = 42075$$

The average marks in Economics of candidates who obtained 50 marks in Statistics is:

- (a) 45 (b) 54.5  
(c) 54 (d) 47.5

Q30. If the correlation coefficient between two variables is 1, then the two lines of regressions are:

- (a) Parallel (b) At right angles  
(c) Coincident (d) None of these

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ANSWER KEY:

1. A	2. B	3. C	4. C	5. A	6. B	7. C	8. B	9. B	10. A
11. C	12. B	13. D	14. B	15. B	16. B	17. B	18. B	19. C	20. B
21. B	22. D	23. A	24. B	25. B	26. D	27. D	28. C	29. B	30. C