

# OPEN STUDENT FOUNDATION

Date : 19-02-2024

STD 12 Commerce Statistics  
IMPORTANT QUESTIONS DAY 2

Total Marks : 57

\* Answer The Following Questions as Directed.

[12]

1. Find the value of  $r$  if  $\Sigma(x - \bar{x})(y - \bar{y}) = -65$ ,  $S_x = 3$ ,  $S_y = 4$  and  $n = 10$ .
2. Find the value of  $r$  if  $\text{Cov}(x,y) = 120$ ,  $S_x = 12$  and  $S_y = 15$ .
3. For 10 the pairs of the observations ,  $\Sigma d^2 = 120$ . Find the value of rank correlation coefficient.
4. Find the correlation coefficient from the following information of rainfall (X) (in cm) and yield (Y) (tons per hectare) for the last 10 years of a district:  $n = 10$ ,  $\text{Cov}(x, y) = 30$ , S.D. of X = 5 and variance of Y = 144
5. To study the relationship between the marks obtained in Statistics (X) and marks in Economics (Y) of the students of a school, a sample of ten students is taken and the following information is obtained.  
 $\Sigma(x - \bar{x})(y - \bar{y}) = 120$ ,  $\Sigma(x - \bar{x})^2 = 80$ ,  $\Sigma(y - \bar{y})^2 = 500$   
Find the value of  $r$ .
6. Determine the value of the correlation coefficient from the following results.  
 $\text{Cov}(x, y) : s_x^2 = 3 : 5$  and  $s_x : s_y = 1 : 2$

\* Answer The Following Questions as Directed.

[15]

7. Interpret  $r = 1$ ,  $r = -1$  and  $r = 0$ .
8. The information obtained on the basis of ranks given by two judges to eight contestants of a dance competition is given below :  
 $\Sigma(R_x - R_y)^2 = 126$   
Where  $R_x$  and  $R_y$  are the ranks given to a contestant by two judges respectively. Find Spearman's rank correlation coefficient.
9. The coefficient of rank correlation of the marks obtained by 10 students in two particular subjects was found to be 0.5. Later on, it was found that one of the differences of the ranks of a student was 7 but it was taken as 3. Find the corrected value of the correlation coefficient.
10. The principal of a school has conducted a test for five students selected in a sample to judge the relation between the knowledge of Mathematics and memory ability in the subject of History of the students. The ranks given to these five students in the subjects of Mathematics and History are given below. Find the rank correlation coefficient between ranks of two subjects using this information.

<b>Student</b>	A	B	C	D	E
<b>Rank in Mathematics</b>	2	5	1	4	3
<b>Rank in History</b>	4	1	5	2	3

11. The singing talent of five singers A, B, C, D and E was judged by two judges in a singing competition. The ranks assigned to five singers are as follows.

<b>Rank</b>	1	2	3	4	5
<b>By Judge 1</b>	C	A	B	E	D
<b>By Judge 2</b>	B	C	D	A	E

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Find the similarity between the decisions of the two judges from the rank correlation coefficient.

**\* Calculate The Following Sums In Detail.**

**[30]**

12. Find the Karl Pearson's correlation coefficient from the following information of the average weekly hours spent on Video games and the grade point obtained in an examination by 6 children of a big city.

Weekly average hours spent for Video games	43	47	45	50	40	51
Grade points obtained in an examination	5.2	4.9	5.0	4.7	5.4	4.3

Calculate the correlation coefficient by Karl Pearson's method.

13. Find the Karl Pearson's correlation coefficient between density of population (per square km) and death rate (per thousand) from the following data.

City	A	B	C	D	E	F	G
Density (per sq. km)	750	600	350	500	200	700	850
Death rate (per thousand)	30	20	15	20	10	25	50

14. In order to study the relation between the sales (in crore ?) and the profit (in thousand ?) for truck tyre manufacturing companies, the following information is obtained for the last year.

<b>Sales (crore ₹) x</b>	1.6	2.2	1.9	2.0	2.3	1.7	2.4	1.8	2.1
<b>Profit (thousand ₹) y</b>	4200	5500	6000	6200	6100	4900	5900	5000	6700

Find the correlation coefficient between the sales and the profit from it.

15. An Engineer Association wants to know the relation between the production (thousand units) and the unit production cost of different factories. The information collected from six factories regarding their production and unit production cost is given below:

<b>Production (thousand units)</b>	15	20	35	24	18	31
<b>Cost per unit of production (₹)</b>	95	90	75	80	87	70

Find the correlation coefficient between production and cost per unit of production.

16. The following information is obtained to study the effect of the use of fertilizer on yield of corn in a rural area:

<b>Use of fertilizer (quintal)</b>	1.5	2.1	0.9	1.8	1.1	1.2
<b>Yield of corn per hectare (quintal)</b>	60	95	50	75	45	75

Find the correlation coefficient between use of fertilizer and yield of corn.

17. From the following information of heights of husband and wife, calculate the rank correlation coefficient between their heights:

<b>Height of husband (cms)</b>	156	153	185	157	163	191	162
<b>Height of wife (cms)</b>	154	148	162	157	162	170	154

