INDIAN SCHOOL AL WADI AL KABIR

Class: XI	Department: Commerce
WORKSHEET: 1	Topic: Correlation

MCQ:

1. Karl Pearson's correlation coefficient indicates the _____ and also the degree of relationship between two variables.

    a. Direction

    b. Relation

    c. Interpretation

    d. None of these

2. Which of the following pair is correctly matched?

Column I (Method)		Column II (Formula)
A. Direct Method	(i)	$r = \dfrac{\Sigma dxdy \cdot n - (\Sigma dx)(\Sigma dy)}{\sqrt{\Sigma dx^2 \cdot n - (\Sigma dx)^2} \times (\sqrt{\Sigma dy^2 \cdot n - (\Sigma dy)^2}}$
B. Short-cut Method	(ii)	$r = \dfrac{\Sigma xy}{n \cdot \sigma_x \cdot \sigma_y}$
C. Step Deviation Method	(iii)	$r = \dfrac{\Sigma dx'dy' \cdot n - (\Sigma dx')(\Sigma dy')}{\sqrt{\Sigma dx'^2 \cdot n - (\Sigma dx')^2} \times \sqrt{\Sigma dy'^2 \cdot n - (\Sigma dy')^2}}$

a. A-i
b. B-ii
c. C-iii
d. None of these

3. Statement1: Correlation coefficient portrays the relation between two variables.

    Statement 2: Its value lies between -1 and +1.

    a. Statement 1 is correct and statement 2 is incorrect.

    b. Statement 1 is incorrect and statement 2 is correct.

c. Both the statements are correct.

d. Both the statements are incorrect.

4. Where is correlation multiple placed:
    (a) Between 0 and + 1
    (b) Between – 1 and 0
    (c) Between – 1 and + 1
    (d) None of these.

5. A scatter diagram:
    a. Is a statistical test
    b. Must be linear
    c. Must be curvilinear
    d. Is a graph of X and Y values

6. The correlation coefficient will be -1 if the slope of the straight line in a scatter diagram is:
    a. Positive
    b. Negative
    c. Zero
    d. None of these

7. In a negative relationship:
    a. As X increases, Y increases
    b. As X decreases, Y decreases
    c. As X increases, Y decreases
    d. Both (a) and (b)

8. Relation between price and demand is:
    a. Positive
    b. Negative
    c. One to one
    d. No relationship

9. When r = 1, all the points in a scatter diagram would lie:
    a. On a straight line directed from lower left to upper right
    b. On a straight line
    c. On a straight line directed from upper left to lower right
    d. Both (a) and (b)

10. The correlation between sale of cold drinks and day temperature is :
    a. Positive
    b. Negative
    c. Zero
    d. None of these

11. The correlation between ages of husbands and wives is:
    a. Positive
    b. Negative

   c. Zero

   d. None of these

12. Simple correlation is called:
   a. Linear correlation
   b. Nonlinear correlation
   c. Both (a) and (b)
   d. None of these

13. The correlation between shoe-size and intelligence is:
   a. Zero
   b. Negative
   c. Positive
   d. None of these

14. Correlation measures ---------, not ----------. (causation /covariation)
   A: covariation, causation

15. ------------- gives a visual presentation of the relationship and is not confined to linear relations.

   A: scatter diagram

16. Of the following three measures which can measure any type of relationship?

   (a) Karl Pearson's coefficient of correlation

   (b) Spearman's rank correlation

   (c) Scatter diagram

   (d) None of the above

17. The unit of correlation coefficient between height in feet and weight in kgs is

   (a)Kg/feet

   (b)Percentage

   (c)Non-existent

   (d)None

18. A high value of 'r' indicates strong linear relationship. True/False.

19. If $r_{XY} = 0$, the variable X and Y are
      (a) linearly related
       (b) not linearly related
       (c) independent

        (d) perfectly correlated

20. Karl Pearson's coefficient of correlation is also known as ------

(a) product moment correlation coefficient
(b) simple correlation coefficient
(c) rank correlation coefficient
(d) both (a) and (b)

21. Calculate Karl Pearson's coefficient of correlation:
    X: 20   18   16   15   14   12   12   10   8   5
    Y: 12   16   10   14   12   10   9   8   7   2
    (Ans: 0.87)

22. Compute Karl Pearson's coefficient of correlation and interpret the result:
    Marks in Mathematics: 15   18   21   24   27
    Marks in Economics :   25   25   27   31   32
    (Ans: 0.95)

23. Calculate the coefficient of correlation by step deviation method:
    Income (Rs Lac): 23   27   28   29   30   31   33   35   36   39
    Expenditure   : 18   22   23   24   25   26   28   29   30   32
    (Ans: 0.99)

24. Calculate the correlation coefficient between the heights of fathers in inches
    (X) and their sons (Y).

X	65	66	57	67	68	69	70	72
Y	67	56	65	68	72	72	69	71

(Ans: 0.44)

25. Calculate the correlation coefficient between X and Y and comment on their
    relationship.

X	−3	−2	−1	1	2	3
Y	9	4	1	1	4	9

(Ans: 0)

26. Calculate the correlation coefficient between X and Y and comment on their
    relationship.

X	1	3	4	5	7	8
Y	2	6	8	10	14	16

(Ans: 1)

Assertion n Reasoning Questions: (Studiestoday.com)

Alternatives:
a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of
   Assertion (A)
b. Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation
   of Assertion (A)
c. Assertion (A) is true, but Reason (R) is false.
d. Assertion (A) is false, but Reason (R) is true.

1. Assertion: Correlation analysis is a means for examining the relationship systematically.

    Reason: Causation explains the cause and effect relationship between variables.

2. Assertion: Sale of ice cream increases during summer, shows positive correlation.

    Reason: When two variable moves in the same direction, it shows positive correlation.

3. Assertion: Broadly, there are two types of correlation: positive and negative.

    Reason: Correlation is said to be positive when the two variables move together in the same direction and the correlation is said to be negative when they move in opposite direction.

4. Assertion: Karl Pearso's method is mathematical in nature.

    Reason: Value of correlation coefficient helps in identifying the nature of correlation between variables.

Case-Based questions: (Studiestoday.com)

Coefficient of correlation is an important statistical tool which is used to measure the relationship between two variables. This is not only useful in the field of statistics but also used in other disciplines like Economics, Geography, Psychology.
In the present time due to the outbreak of Covid-19 corona virus, demand has gradually come down in almost all areas. As per the latest estimates, demand for car has decreased after the nationwide lockdown is lifted in phased manner.

1. If one variable changes in exactly the reverse direction of the other variable, _____ should be the degree of correlation.

2. Which method of calculating correlation uses actual mean method?

3. In perfect positive correlation, the value of r is _____.

4. What will be the correlation between demand for car and varied level of income due to nationwide lockdown?

5. The relation between using mask and being injected by the vaccine will be _____.