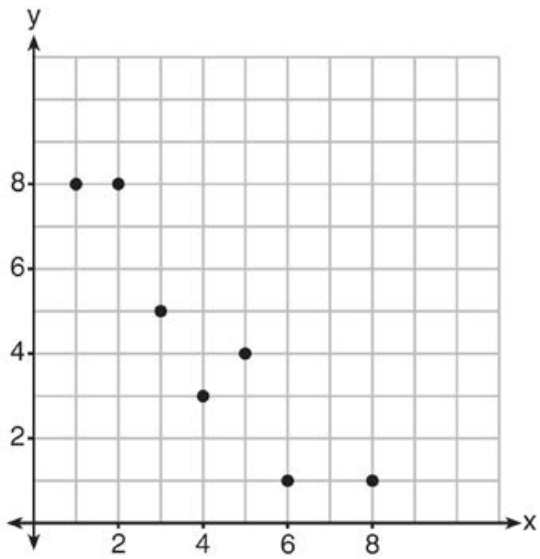
INDIAN SCHOOL AL WADI AL KABIR

Class: XI	**Department: Commerce**	
Worksheet: 1	**Topic: Correlation**	

1. What is the correlation coefficient of the linear fit of the data shown below, to the *nearest hundredth*?



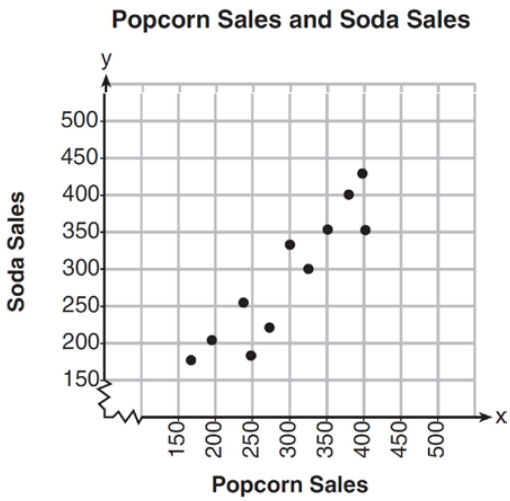
A) 1.00

B) 0.93

C) -0.93

D) -1.00

2. The scatterplot below compares the number of bags of popcorn and the number of sodas sold at each performance of the circus over one week.



Which conclusion can be drawn from the scatterplot?

A) There is a negative correlation between popcorn sales and soda sales.

B) There is a positive correlation between popcorn sales and soda sales.

C) There is no correlation between popcorn sales and soda sales.

D) Buying popcorn causes people to buy soda.

3. The table below shows the time, in hours, spent by students on electronic devices and their math test scores. The data collected model a linear regression.

Time Spent on an Electronic Device (hours)	**Math Test Score**
3	85
1	99
4	81
0	98
3	90
7	65
5	78
2	90

What is the correlation coefficient, to the *nearest hundredth*, for these data?

A) −0.98
B) −0.95
C) 0.98
D) 0.95

4. 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

5. Where is correlation multiple placed:

(a) Between 0 and + 1
(b) Between – 1 and 0
(c) Between – 1 and + 1
(d) None of these.

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. The statistical tool that studies the degree of association between two variables is called:
a) Correlation
b) Regression
c) Index numbers
d) None of these

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

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

13. Which one of the following statements about the correlation coefficient is correct?

a. The correlation coefficient is unaffected by scale changes.
b. Both the change of scale and the change of origin have no effect on the correlation coefficient.
c. The correlation coefficient is unaffected by the change of origin.
d. The correlation coefficient is affected by changes of origin and scale.

14. Who suggested the mathematical approach for determining the magnitude of a linear relationship between two variables, such as X and Y?
    a. Ya Lun Chou
    b. Croxton and Cowden
    c. Karl Pearson
    d. Spearman.

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

(a)Kg/feet

(b)Percentage

(c)Non-existent

(d)None

16. Calculate K.P.'s coefficient of correlation between the following two series:

Husband's Age	24	27	28	28	29	30	32	33	35	35	40
Wife's Age	18	20	22	25	22	28	28	30	27	30	22

(Ans. 0.504*)

17. Calculate the coefficient of correlation by step deviation method:

Income	23	27	28	29	30	31	33	35	36	39
Expenditure	18	22	23	24	25	26	28	29	30	32

(Ans: 0.99)

18. Draw a scatter diagram for the following data:

X	1	3	6	9	11
Y	12	28	37	28	12

Assertion and Reasoning questions:

Alternatives:

(A) Assertion (i) and Reason (ii) are true and Reason (ii) is the correct explanation of Assertion (i)
(B) Both Assertion (i) and Reason (ii) are true and Reason (ii) is not the correct explanation of Assertion (i)
(C) Assertion (i) is true but Reason (ii) is false.
(D) Assertion (i) is false but Reason (ii) is true.

1. Assertion (A): Correlation does not talk about cause-and-effect relationship.

Reason (R): Correlation studies the relationship between two variables

Ans. The correct answer is option B, which states that both the Assertion and Reason are

true, but the Reason is not the correct explanation of the Assertion

2. Assertion: The correlation between two variables "Intensity of cold" and "Sale of woollen clothes" is positive.

Reason: The correlation is said to be positive when the variables move together in the same direction.
Ans. A

3. Read the following statements and choose the correct alternative

Statement 1: Scatter diagram indicates the exact numerical value of correlation
Statement 2: Scatter diagram does not require to calculate any number.

a) Statement 1 is true and statement 2 is false
b) Statement 1 is false and statement 2 is true
c) Both statements 1 and 2 are true
d) Both statements 1 and 2 are true

Ans. b) Statement 1 is false and statement 2 is true.

Case Study:

Read the given cases carefully and answer the questions on the basis of the same.

A researcher collected data on the annual income and expenditure of 10 households in a locality. The data showed that as income increased, expenditure also increased proportionally. The correlation coefficient calculated between income and expenditure was +0.85.

Questions:

1. What type of correlation exists between income and expenditure? Explain.
2. What does a correlation coefficient of +0.85 suggest about the relationship between income and expenditure?
3. Can it be concluded that an increase in income causes an increase in expenditure? Why or why not?
4. Suggest two other pairs of variables that might show a similar correlation pattern.

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