INDIAN SCHOOL AL WADI AL KABIR

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

MCQs

1. Correlation studies the relationship between:
   a) Two unrelated variables
   b) Two variables
   c) Only quantitative variables
   d) Only qualitative variables

2. If both variables move in the same direction, the correlation is:
   a) Negative
   b) Zero
   c) Positive
   d) Perfect negative

3. When the price of a commodity rises and its demand falls, the correlation is:
   a) Positive
   b) Negative
   c) Zero
   d) Perfect positive

4. The range of Karl Pearson's coefficient of correlation is:
   a) 0 to infinity
   b) $-1-1$ to $+1+1$
   c) $-\infty-\infty$ to $+\infty+\infty$
   d) 0 to 100

5. A correlation coefficient has:
   a) The unit of the first variable
   b) The unit of the second variable
   c) No unit
   d) The unit of both variables

6. If $r=+1r=+1$, the relationship is:
   a) Perfect positive
   b) Perfect negative
   c) No correlation

d) Weak positive

7. If r=0*r*=0, the variables are:
   a) Perfectly correlated
   b) Not linearly related
   c) Always independent
   d) Perfectly negatively correlated

8. Which method gives a visual idea of correlation without calculating a numerical value?
   a) Scatter diagram
   b) Karl Pearson's method
   c) Spearman's rank method
   d) Standard deviation method

9. Spearman's rank correlation is especially useful when:
   a) Data are precisely measured
   b) Variables cannot be measured precisely and can only be ranked
   c) Data are always linear
   d) There is no relationship between variables

10. Correlation between two variables:
    a) Always proves causation
    b) Measures covariation, not causation
    c) Measures only cause-and-effect relationships
    d) Cannot be calculated for economic data.

Assertion–Reasoning Questions

11. Assertion (A): If the value of r*r* is +0.95+0.95, there is a strong positive correlation between the variables.
Reason (R): A value of r*r* close to +1+1 indicates that the variables move in the same direction and have a strong linear relationship.

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

12. Assertion (A): A positive correlation between ice-cream sales and deaths due to drowning proves that ice-cream consumption causes drowning.
Reason (R): Correlation measures covariation, but it does not establish a cause-and-effect relationship.

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

Statement-Based Questions

13. Statement I: A scatter diagram can show the direction of relationship between two variables.

Statement II: A scatter diagram provides an exact numerical value of correlation.
a) Both Statement I and Statement II are true.
b) Both Statement I and Statement II are false.
c) Statement I is true, but Statement II is false.
d) Statement I is false, but Statement II is true.

14. Statement I: Karl Pearson's coefficient of correlation is suitable for measuring linear relationships between precisely measured variables.
Statement II: Spearman's rank correlation can be used when variables such as honesty or beauty are ranked rather than measured numerically.
a) Both Statement I and Statement II are true.
b) Both Statement I and Statement II are false.
c) Statement I is true, but Statement II is false.
d) Statement I is false, but Statement II is true.

Case Study:

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

A researcher surveyed **eight households** in a locality to study whether a higher monthly income is associated with higher monthly consumption expenditure.

Household	Monthly Income (OMR)	Monthly Consumption Expenditure (OMR)
A	300	230
B	400	290
C	500	340
D	600	410
E	700	460
F	800	530
G	900	580
H	1000	640

The researcher observed that consumption expenditure generally rises as household income increases. However, she cautioned that this relationship does not by itself prove that income is the only factor influencing expenditure; family size, saving habits, prices, and borrowing may also matter.

Questions

1. Identify the two variables in the study.

2. Predict the type of correlation shown by the data: positive, negative, or zero. Give one reason.

3. If these observations were plotted on a scatter diagram, in which general direction would the dots move?

4. State whether the relationship appears weak, moderate, or strong. Explain using the pattern in the table.
5. Calculate Karl Pearson's coefficient of correlation to interpret the result and state whether the

relationship appears weak, moderate, or strong.

6. Does correlation establish a cause-and-effect relationship? Explain with reference to this case.

Answers

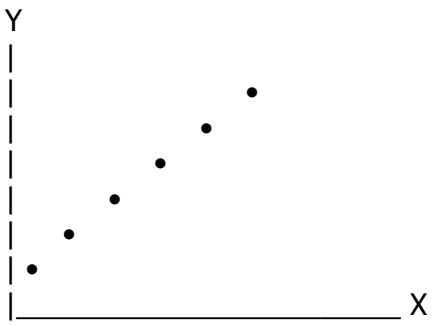
1. **Variables:**
   - Income of households
   - Consumption expenditure of households
2. The data show a **positive correlation** because consumption expenditure generally increases when income increases.examspark
3. On a scatter diagram, the dots would move **upward from left to right**, indicating a positive relationship.
4. For this data, the calculated value is approximately:
5. r≈+0.999\boxed{r \approx +0.999}r≈+0.999 and The relationship is **strong and positive**, because the values rise consistently and lie close to an upward-sloping straight line. This shows an **almost perfect positive correlation** between household income and consumption expenditure.

6. No. Correlation only indicates that two variables move together; it does not prove that one variable alone causes the other. Consumption may also be affected by family size, saving habits, prices, and borrowing.

What does a correlation coefficient close to +1+1+1 tell you about the direction and strength of the relationship?

Picture-Based Question

Study the scatter diagram below and answer the questions that follow.



The diagram shows values of two variables, XXX and YYY, plotted as points. A scatter diagram is used to visually examine the nature and intensity of the relationship between variables.

1. What type of correlation is shown in the scatter diagram: positive, negative, or zero?
2. Give one reason for your answer based on the direction of the plotted points.
3. What would be the approximate sign of Karl Pearson's coefficient of correlation for this diagram: positive or negative?
4. If all the points had lain exactly on the upward-sloping straight line, what type of correlation would it represent?
5. State one limitation of using a scatter diagram compared with Karl Pearson's coefficient of correlation.

Answers

1. The diagram shows **positive correlation**.

2. The points move **upward from left to right**; as XXX increases, YYY also increases.
3. The coefficient of correlation would be **positive**.
4. It would represent **perfect positive correlation**, where r=+1r = +1r=+1.
5. A scatter diagram shows the direction and approximate strength of a relationship, but it does **not give an exact numerical value** of correlation; Karl Pearson's method does.

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