



INDIAN SCHOOL AL WADI AL KABIR

DEPARTMENT OF COMMERCE CORRELATION

1. Define the following:

a. Correlation:

Correlation studies the relationship between the two variables say X and Y.

b. Linear correlation:

If the amount of change in any one variable tends to bear a constant relation with the amount of change in the other variable, then the correlation is said to be linear correlation. It can be represented by drawing a straight line on graph paper.

c. Scatter diagram:

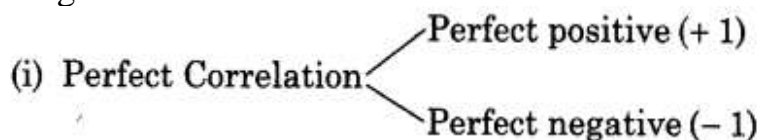
It is a useful technique used for examining visually the form of relationship between the two given variables, without calculating any numerical value.

2. What is correlation? Distinguish between positive and negative Correlation.

Correlation studies and measures the direction and intensity of relationship among variables. If the two variables X and Y move in the same direction, i.e.: with an increase in one variable, the other variable also increases or with the fall in one variable, the other variable also falls, the correlation is said to be positive. For eg: When the income rises, consumption also rises. There is a positive correlation between them. Whereas if the two variables X and Y move in the opposite direction, i.e., with the increase in one variable, the other variable falls or with the fall in one variable, the other variable rises, the correlation is said to be negative correlation. Eg: when the price of a commodity rises, its demand falls. There is a negative correlation between them.

3. Note on Degree of Correlation:

Degree of correlation refers to the coefficient of correlation



- (ii) Absence of Correlation
- (iii) Limited Degree of correlation

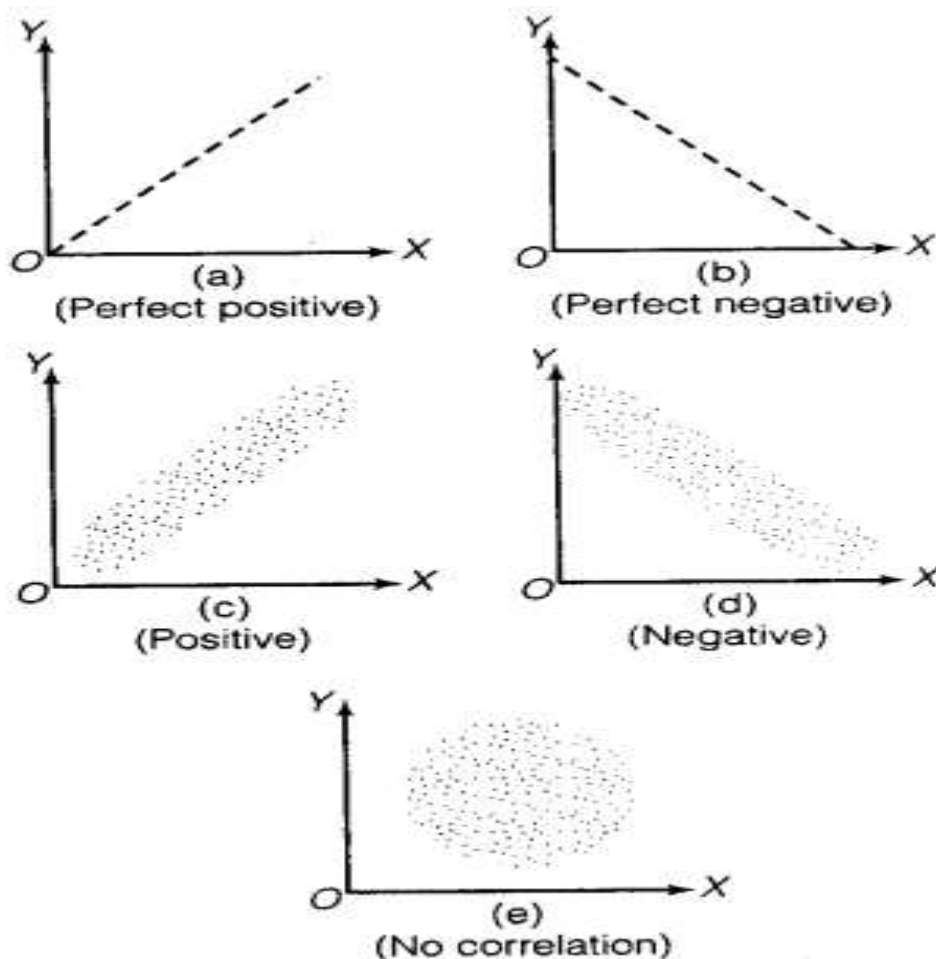
The degree of correlation between 0 and 1 may be rated as

- High (0.75 and 1)
- Moderate (0.25 and 0.75)
- Low (0 and 0.25)

4. **Name the graphic method of measuring dispersion.**

The graphic method of measuring dispersion is called Scatter Diagram.

Scattered diagram offers a graphic expression of the direction and degree of correlation.



Its **DEMERITS** are:

- a. It does not indicate the numerical value of correlation as it is a non-mathematical method.
- b. It provides only a broad and rough idea of the correlation between the two variables.
- c. In case of more than two variables, it is not possible to draw a scatter diagram.

5. **Does correlation imply causation?**

No, correlation measures do not imply causation. Correlation measures co-variation and not causation. Correlation does not imply cause and effect relation. The knowledge of correlation only gives us an idea of the direction and intensity of change in a variable when the correlated variable changes. The presence of correlation between two variables X and Y simply means that when the value of one variable is found to change in one direction, the value of the other variable is found to change either in the same direction (i.e. positive change) or in the opposite direction (i.e., negative change), in a definite way.

6. **Does zero correlation mean independence?**

No, zero correlation does not mean independence. If there is zero correlation ($r_{XY} = 0$), it means the two variables are uncorrelated and there is no linear relation between them. However, other types of relation may be there and they may not be independent.

7. **List some variables where accurate measurement is difficult.**

Accurate measurement is difficult in case of:

- Qualitative variables such as beauty, intelligence, honesty, etc.
- It is also difficult to measure subjective variables such as poverty, development, etc which are interpreted differently by different people.

8. **Interpret the values of r as 1, -1 and 0:**

- If $r = 0$ the two variables are uncorrelated. There is no linear relation between them. However, other types of relation may be there and hence the variables may not be independent.
- If $r = 1$ the correlation is perfectly positive. The relation between them is exact in the sense that if one increases, the other also increases in the same proportion and if one decreases, the other also decreases in the same proportion.
- If $r = -1$ the correlation is perfectly negative. The relation between them is exact in the sense that if one increases, the other decreases in the same proportion and if one decreases, the other increases in the same proportion.

9. **KARL PEARSON'S COEFFICIENT OF CORRELATION**

a. **ACTUAL MEAN METHOD:**

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \cdot \sum y^2}}$$

b. **STEP DEVIATION METHOD:**

$$r_{XY} = \frac{n \sum d'X d'Y - (\sum d'X)(\sum d'Y)}{\sqrt{n \sum d'X^2 - (\sum d'X)^2} \sqrt{n \sum d'Y^2 - (\sum d'Y)^2}}$$