Statistics Theory Weightage till Sep24

Chapter → Exam↓	Chp13	Chp14	Chp17	Chp18	Total
May 18	2	4	6	8	**20**
Nov 18	6	1	2	3	**12**
Jun 19	5	3	1	5	**14**
Nov 19	1	7	2	5	**15**
Nov 20	8	5	3	6	**22**
Jan 21	10	5	2	4	**21**
Jul 21	6	1	1	0	**8**
Dec 21	3	5	2	4	**14**
Jun 22	9	3	4	6	**22**
Dec 22	4	3	1	3	**11**
Jun 23	2	0	0	2	**4**
Dec 23	5	0	2	2	**9**
Jun 24	7	3	2	4	**16**
Sep 24	8	4	3	3	**18**

Theory Summary Revision

THEORY CONCEPTS

Statistical Description of Data – Basics of Statistics

Definition of Statistics

- Plural Sense: Any data – quantitative or qualitative used for statistical analysis.
- Singular Sense: Scientific method of collecting, analyzing, and presenting data to draw statistical inferences. It is also called as Science of Averages or Science of Counting

Origin of Word

Language	Actual Word	Memorize by
Latin	Status	Latus
Italian	Statista	Pasta
German	Statistic	Breadstick
French	Statistique	Barbeque

Publication

Koutilya's Arthashastra	• Record of Birth and Deaths • Chandragupta's reign • 4th Century B.C
Abu Fezal's Ain-i-Akbari	• Record on Agriculture • Akbar Reign • 16th Century A.D.
First Census	• Egypt 300 BC to 2000 BC • By Pharaoh

<table>
<tr><td>Application of Statistics</td><td>• Economics: Demand Analysis, Future Projection etc.
• Business Management: Decision making using quantitative techniques not intuition
• Industry and Commerce: Profit maximization using business data – sales, purchase, market etc. by consulting experts</td></tr>
<tr><td>Limitation of Statistics</td><td>• It deals with aggregate data and not individual data
• Quantitative data can only be used, however for qualitative – it needs to be converted into quantitative
• Projections are based on conditions/ assumptions and any change in that will change the projection. Example: Future projections of sales
• Sampling based conclusions are used, improper sampling leads to improper results. Random Sampling is must.</td></tr>
<tr><td>Data</td><td>• Quantitative Information shown as number
• Primary: first time collected by agency/ investigator
• Secondary: collected data used by different person/ agency</td></tr>
<tr><td>Variable</td><td>• Measurable Data – Value can vary
<table>
<tr><td>Discrete Variable</td><td>• When a variable assumes a finite or count ably infinite isolated values.
• Example: no. of petals in a flower, no. of road accident in locality</td></tr>
<tr><td>Continuous Variable</td><td>• When a variable assumes any value from the given interval (can also be in decimals, fractions).
• Example: height, weight, sale, money</td></tr>
</table></td></tr>
<tr><td>Attribute</td><td>• Qualitative Characteristics. Example: gender of a baby, the nationality of a person, the colour of a flower etc.</td></tr>
<tr><td>Collection of Primary Data – Interview Method</td><td>
<table>
<tr><th>Method</th><th>Details</th></tr>
<tr><td>Personal Interview</td><td>• Where data is collected directly from respondents.
• Highly Accurate – Low Coverage
• Example: Natural Calamity, Door to Door Survey</td></tr>
<tr><td>Indirect Interview</td><td>• When reaching respondent is difficult, data is collected by contacting associated persons.
• Highly Accurate – Low Coverage
• Example: Rail accident</td></tr>
<tr><td>Telephone Interview</td><td>• Data is collected over phone
• Quick and non-expensive method
• Low Accuracy – High Coverage</td></tr>
</table></td></tr>
<tr><td>Collection of Primary Data – Mailed Questionnaire Method</td><td>• In this method well drafted and soundly sequenced questionnaire,
• covering all the important aspects of the data requirement is sent to respondent for filling.
• Here coverage is wide but amount of non-responses will be maximum</td></tr>
</table>

<table>
<tr><td>Collection of Primary Data – Observation Method</td><td>

In this method data is collected by direct observation or using instrument.
For example: data on height and weight for a group of students.
Although more accurate but it is time consuming, low coverage and laborious method.

</td></tr>
<tr><td>Collection of Primary Data – Questionnaire Filled and sent by Enumerators</td><td>

Mix of Interview and Mailed Questionnaire
Enumerator means a Person who directly interacts with respondent and fills the questionnaire.
It is generally used in case of Surveys and Census.

</td></tr>
<tr><td>Sources of Secondary Data</td><td>
<table>
<tr><td>International Sources</td><td>World Health Organization (WHO), International Monetary Fund (IMF), International Labor Organization (ILO), World Bank</td></tr>
<tr><td>Government Sources</td><td>In India – Central Statistics Office (CSO), Indian Agricultural Statistics by the Ministry of Food and Agri, National Sample Survey Office- NSSO, Regulators – RBI, SEBI, RERA, IRDA</td></tr>
<tr><td>Private or Quasi-govt. sources</td><td>Indian Statistical Institute (ISI), Indian Council of Agriculture, NCERT</td></tr>
</table>
</td></tr>
<tr><td>Scrutiny of Data</td><td>

checking accuracy and consistency of data
There is no rule for it, one must apply his intelligence, patience and experience while scrutinizing the given information.
Internal Consistency: When two or more series of related data are given, we should check consistency among them.

</td></tr>
<tr><td>Presentation of Data – Classification / Organization of Data</td><td>
Classification or Organisation: putting data in a neat, precise, and condensed form, making it comparable, suitable for analysis, more understandable.
<table>
<tr><td>Chronological/ Temporal/ Time Series Data</td><td>• Data arranged based on Time
• Example: Revenues YoY i.e year on year</td></tr>
<tr><td>Geographical or Spatial Series Data</td><td>• Arrangement based on regions
• Example: Country wise Revenue of a global company</td></tr>
<tr><td>Qualitative or Ordinal Data</td><td>• Based on some attribute
• Nationality Wise Medal Winners in Olympics</td></tr>
<tr><td>Quantitative or Cardinal Data</td><td>• Based on some variable
• Example: Frequency Distribution of a Data</td></tr>
</table>
</td></tr>
<tr><td>Mode of Presentation of Data – Textual</td><td>

This method comprises presenting data with the help of a paragraph or several paragraphs.
This is not a suitable mode of presentation as it is dull, monotonous and non-comparable.

</td></tr>
</table>

<table>
<tr><td>Mode of Presentation of Data – Tabular Form</td><td>

When data is shown in the form of Table.
Useful in easy comparison
Complicated data can be presented
Table is must to create a diagram
No analysis possible without table
Components of Table

</td></tr>
<tr><td>Components of Table</td><td>
<table>
<tr><th>Description</th><th>Name of Component of Table</th></tr>
<tr><td>Entire Upper Part</td><td>Box Head</td></tr>
<tr><td>Upper Part describing columns and sub-columns</td><td>Caption</td></tr>
<tr><td>Left part of the table describing rows</td><td>Stub</td></tr>
<tr><td>Main Data of Table</td><td>Body</td></tr>
<tr><td>Source of Data at the bottom of Table</td><td>Footnote</td></tr>
</table>
</td></tr>
<tr><td>Mode of Presentation of Data – Diagrams</td><td>

Can be used by educated and uneducated section of society
Hidden trend can be traced
If priority is accuracy, then tabulation is better

</td></tr>
<tr><td>Line Diagram</td><td>

Time Series is generally in x axis
For wide fluctuation – log chart or ratio chart is used
Two or more series of same unit – Multiple Line Chart
Two or more series of different unit – Multiple Axis Chart

</td></tr>
<tr><td>Bar Diagram</td><td>

Bar means rectangle of same width and of varying length drawn horizontally or vertically
For comparable series – multiple or grouped bar diagrams can be used
For data divided into multiple components – subdivided or component bar diagrams
For relative comparison to whole, percentage bar diagrams or divided bar diagrams
Vertical Bar Diagram: Useful for Data varying over Time and Quantitative Data
Horizontal Bar Diagram: Useful for Data varying over Space and Qualitative Data

</td></tr>
<tr><td>Pie Chart</td><td>

Used for circular presentation of relative data (% of whole)
Summation of values of all components/segments are equated to 360 Degree (total angle of circle)
Segment angle = $\frac{\textbf{(segment value x 360°)}}{\textbf{(total value)}}$

</td></tr>
</table>

Statistical Description of Data – Frequency Distribution

Frequency and Distribution

- Frequency means number of times a particular observation is repeated.
- Frequency Distribution is table which contains observation or class intervals in one column and corresponding frequency in the other.
- Definition: A frequency distribution may be defined as a
  - tabular representation of statistical data, usually in an ascending order,
  - relating to a measurable characteristic
  - according to individual value or a group of values of the characteristic under study.

Types of Frequency Distribution

Ungrouped/ Simple Frequency Distribution

- When there are limited number of distinct observations, frequency can be assigned to each one of them.
- This distribution is simple

Grouped Frequency Distribution

- When there are large no. of observations, grouping is done among them (generally in ascending order).
- Each group is called as class interval and frequency is assigned to group and not individual values,
- this is called Grouped Frequency Distribution

Class Limit

- For a class interval CL is the minimum and maximum value the class interval may contain
- Minimum Value – Lower Class Limit
- Maximum Value – Upper Class Limit

Class Interval	Frequency	LCL	UCL
10-19	10	10	19
20-29	5	20	29
30-39	8	30	39

Classification of Grouped of Frequency Distribution

Mutually Exclusive / Overlapping Classification

Class	LCL	UCL
10-20	10	20
20-30	20	30
30-40	30	40

- Here UCL an interval and LCL of next interval are same
- This is usually applicable for continuous variable.
- An observation which is equivalent to common class limit is excluded from the class interval where it is UCL and taken in the class where it is LCL.

<table>
<tr><td></td><td>
Mutually Inclusive / Non-Overlapping Classification
<table>
<tr><th>Class</th><th>LCL</th><th>UCL</th></tr>
<tr><td>10-19</td><td>10</td><td>20</td></tr>
<tr><td>20-19</td><td>20</td><td>30</td></tr>
<tr><td>30-39</td><td>30</td><td>40</td></tr>
</table>

There is no common class limits between two intervals.
This is usually applicable to discrete variable.
All observation including UCL and LCL will be taken in the same class interval as there is no confusion.

</td></tr>
<tr><td>Class Boundary</td><td>
In case of Exclusive / Overlapping Classification
Class Boundary = Class Limit
<table>
<tr><th>Class</th><th>LCL</th><th>UCL</th><th>LCB</th><th>UCB</th></tr>
<tr><td>10-20</td><td>10</td><td>20</td><td>10</td><td>20</td></tr>
<tr><td>20-30</td><td>20</td><td>30</td><td>20</td><td>30</td></tr>
<tr><td>30-40</td><td>30</td><td>40</td><td>30</td><td>40</td></tr>
</table>
In case of Inclusive / Overlapping Classification
Lower Class Boundary
LCB = LCL – 0.5
UCB = UCL + 0.5
<table>
<tr><th>Class</th><th>LCL</th><th>UCL</th><th>LCB</th><th>UCB</th></tr>
<tr><td>10-19</td><td>10</td><td>19</td><td>9.5</td><td>19.5</td></tr>
<tr><td>20-29</td><td>20</td><td>29</td><td>19.5</td><td>29.5</td></tr>
<tr><td>30-39</td><td>30</td><td>39</td><td>29.5</td><td>39.5</td></tr>
</table>
</td></tr>
<tr><td>Mid-Point / Class Mark / Mid Value of Class Interval</td><td>
$\frac{\text{LCL+UCL}}{2}$ $\frac{\text{LCB+UCB}}{2}$

Useful in calculation of AM, GM, HM, SD in case of grouped frequency distribution

</td></tr>
<tr><td>Class Length/ Width or Size</td><td>UCB – LCB only</td></tr>
<tr><td>Cumulative Frequency</td><td>

Less than type: It shows no. of observations less than UCB
More than type: It shows no. of observations more than UCB

<table>
<tr><th>Class Interval</th><th>Freq.</th><th>UCB</th><th>Less than type CF</th><th>More than type CF</th><th>Total of both CF</th></tr>
<tr><td>44-48</td><td>3</td><td>48.5</td><td>3</td><td>33</td><td>36</td></tr>
<tr><td>49-53</td><td>4</td><td>53.5</td><td>7</td><td>29</td><td>36</td></tr>
<tr><td>54-58</td><td>5</td><td>58.5</td><td>12</td><td>24</td><td>36</td></tr>
<tr><td>59-63</td><td>7</td><td>63.5</td><td>19</td><td>17</td><td>36</td></tr>
<tr><td>64-68</td><td>9</td><td>68.5</td><td>28</td><td>8</td><td>36</td></tr>
<tr><td>69-73</td><td>8</td><td>73.5</td><td>36</td><td>0</td><td>36</td></tr>
<tr><td>Total</td><td>36</td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Frequency Density</td><td>$\frac{\text{Class Frequency}}{\text{Class Length of class}}$</td></tr>
<tr><td>Relative Frequency</td><td>$\frac{\text{Class frequency}}{\text{Total Frequency}}$
Its can have values between 0 and 1</td></tr>
</table>

Percentage Frequency	$\frac{\text{Class frequency}}{\text{Total Frequency}} \times 100$
Frequency Dist. Diagram – Histogram	• It is a convenient way to represent FD • Comparison between frequency of two different classes possible • It is useful to calculate mode also
Frequency Polygon	• Usually preferable for ungrouped frequency distribution • Can be used for grouped also but only if class lengths are even
Ogives/ Cumulative Frequency	• This graph can be made by both type of Cumulative Frequency and called as Less than Ogive or More than Ogive • It can be used for calculating quartiles, median
Frequency Curve	• It is a limiting form of Area Diagram (Histogram) or Frequency Polygon • It is obtained by drawing smooth and free hand curve though the mid points • Most used curve is Bell Shaped

Index Numbers

Practical Examples of Index Numbers	• Index numbers are convenient devices for **measuring relative changes (generally in %)** of differences from **time to time** or from **place to place** • Series of numerical figures which show relative position • Index Numbers show percentage changes rather than absolute amounts of change
Data Selection	• It **depends on the purpose** for which the index is used. • Index numbers are often constructed from the **sample**. **Random sampling,** and if need be, a **stratified random sampling** can be used to ensure that sample is representative. • Data should be **comparable** by ensuring consistency in selection method.
Base Period	• It is a **point of reference** in comparing various data. • Standard point of comparison. • The period should be **normal**. • It should be **relatively recent** • Choice of suitable base period is a temporary solution
Use of Averages	• The **geometric mean is better** in averaging relatives, • But for most of the index's **arithmetic mean is used because of its simplicity**
Price/ Quantity/ Value Relative	For Individual Commodity, $\frac{\textbf{Current Period Price/ Quantity/ Value}}{\textbf{Base Period Price/ Quantity/ Value}}$
Link Relative	$\frac{P_1}{P_0}, \frac{P_2}{P_1}, \frac{P_3}{P_2}, \ldots, \frac{P_n}{P_{n-1}}$ Same can be created for quantities also

Chain relatives	When the above relatives are in respect to a fixed base period these are also called the chain relatives $\frac{P_1}{P_0}, \frac{P_2}{P_0}, \frac{P_3}{P_0}, \ldots, \frac{P_n}{P_0}$
Formula for Chain Index (when direct data is not available)	$\frac{\text{Link relative of current year} \times \text{Chain Index of previous year}}{100}$ The chain index is an unnecessary complication unless of course where data for the whole period are not available or where commodity basket or the weights have to be changed.
Limitations of Index Numbers	• Chances of errors due to Sampling • It gives broad trend not real picture • Due to many methods, at times it creates confusion
Usefulness of Index Numbers	• Index numbers are very useful in deflating (eg. Nominal wages into real) • Framing suitable policies in economics and business • They reveal trends and tendencies in making important conclusions • They are used in time series analysis to study long-term trend, seasonal variations and cyclical developments
Formula for Deflated Value	$\text{Deflated Value} = \frac{\text{Current Value}}{\text{Price Index of the current year}}$
Shifted Price Index	$\frac{\text{Original Price Index}}{\text{Price Index of the year on which it has to be shifted}} \times 100$
Unit Test	• This test requires that the formula should be independent of the unit in which or for which prices and quantities are quoted. • Except for the simple (unweighted) aggregative index all other formulae satisfy this test.
Time Reversal Test	• It is a test to determine whether a given method will work both ways in time, forward and backward. • $P_{01} \times P_{10} = 1$ • Laspeyres' method and Paasche's method do not satisfy this test, but Fisher's Ideal Formula does.
Factor Reversal Test	• This holds when the product of price index and the quantity index should be equal to the corresponding value index. • Symbolically $P_{01} \times Q_{01} = V_{01}$ • Fisher's Index Number is ideal as it satisfies Unit, Time Reversal and Factor Reversal Test
Circular Test	• This property therefore enables us to adjust the index values from period to period without referring each time to the original base. • It is an extension of time reversal test • The test of this **shiftability of base** is called the circular test. • This test is not met by Laspeyres, or Paasche's or the Fisher's ideal index.

	• The weighted GM of relative, **simple geometric mean of price relatives** and the **weighted aggregative with fixed weights meet this test.** (These methods are not in syllabus)
Cost of Living Index (also called General Index)	• CLI is defined as the **weighted AM of index numbers** of few groups of basic necessities. • AM of group indices gives the General Index • Generally, for calculating CLI; food, clothing, house rent, fuel & lightning and miscellaneous groups are taken into consideration. • Examples of CLI: WPI, CPI, etc.
Symbol	• P_{01} is the index for time 1 on 0 • P_{10} is the index for time 0 on 1

Measures of Central Tendency

Arithmetic Mean

Property 1	If all the observations are constant, AM is also constant
Property 2	the algebraic sum of deviations of a set of observations from their AM is zero
Property 3	AM is affected both due to change of origin and scale If $y = a + bx$ then $\bar{y} = a + b\bar{x}$
Property 4	Combined AM $\bar{x}_c = \frac{n_1\bar{x}_1 + n_2\bar{x}_2}{n_1 + n_2}$
General Review	• AM is best measure of central tendency • AM is based on all observations • AM is affected by sampling fluctuations • AM is amenable to mathematical property • AM cannot be used in case of open end classification

Median

Property 1	For a set of observations, the sum of absolute deviations is minimum, when the deviations are taken from the median. $\sum\lvert x_i - Me\rvert$
Property 2	Median is also affected by both change of origin and scale.
General Review	• Median is also called as positional average • Median is not based on all observations • Median is not affected by sampling fluctuations • Median is best measure of central tendency in case of open end classification

Partition Values

Meaning

- These may be defined as **values dividing** a given **set of observations** into number of **equal parts**
- When we want to divide the given set of observations into two equal parts, we consider median, similarly there are quartiles, deciles, percentiles

Name of PV	No. of equal parts	No. of PVs	Symbol
Median	2	1	**Me**
Quartile	4	3	Q_1, Q_2, Q_3
Decile	10	9	$D_1, D_2, \ldots, D_9$
Percentile	100	99	$P_1, P_2, \ldots, P_{99}$

Mode – Concept/ Formula

Meaning	Mode is the **value** that **occurs the maximum** number of times
Special Thing about Mode	• If two or more observations are having maximum frequency then there are **multiple modes** [multimodal distribution] • If there are **exactly two** modes then distribution is called as **Bimodal** Distribution • If all observations are having same frequency then distribution has **no mode** • We can say that Mode is **not rigidly defined**
Property 1	If all the observations are constant, mode is also constant
Property 2	Mode is also affected both due to change of origin and scale
General Review	• Mode is not based on all observations • Mode is not rigidly defined • Mode is not amenable to Mathematical Property

Relationship between Mean, Median and Mode

In case of Symmetric Distribution	**Mean = Median = Mode**
In case of Moderately Skewed Distribution (Empirical relationship)	**Mean – Mode = 3 (Mean – Median)**

Geometric Mean

Definition	For a given set of n **positive observations**, the geometric mean is defined as the n^{th} root of the product of the observations

Property 1	Logarithm of G for a set of observations is the AM of the logarithm of the observations $$\log G = \frac{1}{n}\sum \log x$$
Property 2	If all the observations are constant, GM is also constant
Property 3	$\text{GM of } z = \text{GM of } x \times \text{GM of } y$
Property 4	$\text{GM of } z = \frac{\text{GM of } x}{\text{GM of } y}$

Harmonic Mean

Definition	For a given set of **non-zero** observations, harmonic mean is defined as the **reciprocal of the AM of the reciprocals of the observation**
Property 1	If all observations are constant HM is also constant

Use of GM and HM

Both	Both are used for calculating average rates
GM	Appropriate for rates having percentages
HM	Appropriate for rates other than percentages

Measures of Dispersion

Meaning of Measure of Dispersion	• Dispersion for a given set of observations may be defined as • the **amount of deviation** of the observations, • usually, from an **appropriate** measure of **central tendency**	
Types of Measure of Dispersion	**Absolute Measures of Dispersion**	• These are with units • These are not useful for comparison of two variables with different units. • Example: Range, Mean Deviation, Standard Deviation, Quartile Deviation
	Relative Measures of Dispersion	• These are unit free measures • These are useful for comparison of two variables with different units. • Example: Coefficient of Range, Coefficient of Mean Deviation, Coefficient of variation, Coefficient of Quartile Deviation

Range

Property 1	• **Not affected** by change of **origin** • Affected by **change of scale (only value)** • **No impact of sign** of change of scale • Note: **Measure of Dispersion can never be negative**
General Review	• Not Based on All Observations • Easy to Compute

Mean Deviation

Meaning	• Mean deviation is defined as the • **arithmetic mean** of the • **absolute deviations** of the observations • from an **appropriate measure** of central tendency
Property 1	Mean Deviation takes its **minimum value** when deviations are taken from **Median**
Property 2	Change of Origin – **No Affect**, Change of Scale – **Affect of value not sign**
General Review	• Based on **all observations** • Improvement over Range • **Difficult to compute** • **Not amenable to Mathematical Property** because of usage of **Modulus**

Standard Deviation

Meaning	• Improvement over Mean Deviation • It is defined as the **root mean square deviation** when the deviations are <u>taken from the AM</u> of the observations
Coefficient of Variation	$\frac{SD_x}{\bar{x}} \times 100$
SD for any two numbers	$SD = \frac{\lvert a-b \rvert}{2}$
SD for first n natural numbers	$s = \sqrt{\frac{n^2-1}{12}}$
Property 1	If all the observations are constant, SD is **ZERO**
Property 2	No effect of change of origin but affected by change of scale in the magnitude (ignore sign)
Property 3	$SD_c = \sqrt{\frac{n_1 s_1^{\,2} + n_2 s_2^{\,2} + n_1 d_1^{\,2} + n_2 d_2^{\,2}}{n_1 + n_2}}$ $d_1 = \bar{x}_c - \bar{x}_1$ $d_2 = \bar{x}_c - \bar{x}_2$

Quartile Deviation

Meaning	It is semi-inter quartile range
General Review	• It is the **best measure** of dispersion for **open-end** classification • It is also **less affected** due to sampling fluctuations • Like other measures of Dispersion, **QD** is also not affected by change of origin but affected by scale ignoring sign

Correlation and Regression

Bivariate Data

Definition	• When data are collected on two variables **simultaneously**, they are known as **bivariate data** • and the corresponding frequency distribution, derived from it, is known as **Bivariate Frequency Distribution**
Marginal Distribution	• It is the frequency distribution of **one variable** (x or y) across the other variable's **full range of values** • **Number of Marginal Distribution = 2**
Conditional Distribution	• It is the frequency distribution of **one variable** (x or y) across a **particular sub-population** of the other variable. • **No. of Conditional Distributions = m + n** ***m = no. of class interval of x*** ***n = no. of class interval of y***

Scatter Diagram

Concept Points	• It helps us to find **Nature** and **Relative Strength** of Correlation • It is useful for **Non-Linear** Correlation also • It **cannot** be used to determine **value** • Diagrams are **time taking**

Karl Pearson's Correlation Coefficient

How to Calculate	Correlation Coefficient is the ratio of covariance with product of standard deviations	
Property 1	The Coefficient of Correlation is a **unit-free measure**	
Property 2	Value lies from **-1 to +1**	
Property 3	**Change of Origin**	No impact
	Change of Scale	No impact of value, but if change of scale of both variables are of **different sign** then **sign of r** will also change

Interpretation of Value of r	

Value of r	Interpretation
-1	Perfect Negative
Between -1 and 0	Negative
Closer to -1	Strong Negative
Far from -1	Weak Negative
0	No Correlation
Between 0 and 1	Positive
Far from +1	Weak Positive
Near to +1	Strong Positive
+1	Perfect Positive

Spearman's Rank Correlation Coefficient

Usage	• find the level of **agreement (or disagreement**) between two judges so far as assessing a **qualitative characteristic (attribute)** is concerned • Use in case of ranks
Ranking in case of Tie	In case of tie, simple average of ranking should be assigned to tied values

Coefficient of Concurrent Deviations

Usage	A very **quick, simple** and **casual** method of finding correlation when we are not serious about the magnitude of the two variables

Regression Basics

Meaning	Estimation of one variable for a **given value** of another variable on the basis of an **average mathematical relationship** between the two variables	
Requirements	• Estimation of Y when X is given • Estimation of X when Y is given	
General Points	**Perfect Correlation**	• When linear relationship exists between two variables, correlation is perfect. • Perfect Correlation is represented by a linear equation and this equation can be used for regression purpose directly. • Same equation can be used in both ways
	Imperfect Correlation	• In case of imperfect correlation there is no definite line and equation • We will use method of least square to estimate both regression lines

<table>
<tr><td>Formula of Regression Equations/ Lines</td><td>
<table>
<tr><td>Estimation of Y when X is given</td><td>• Use Regression line of Y on X
• Equation Format:
$Y-\bar{Y}=b_{yx}(X-\bar{X})$
b_{yx} is regression coefficient of Y on X</td></tr>
<tr><td>Estimation of X when Y is given</td><td>• Use Regression line of X on Y
• Equation Format:
$X-\bar{X}=b_{xy}(Y-\bar{Y})$
b_{xy} is regression coefficient of X on Y</td></tr>
</table>
</td></tr>
<tr><td>Property 1</td><td>Change of Origin and Scale
• Origin: No Impact
• Scale: If original pair is $x,\ y$ and modified pair is u, v
$b_{vu}=b_{yx}\times\frac{\text{change of scale of y}}{\text{change of scale of x}}$
$b_{uv}=b_{xy}\times\frac{\text{change of scale of x}}{\text{change of scale of y}}$</td></tr>
<tr><td>Property 2</td><td>Two regression lines (if not identical) will intersect at the point [means] $(\bar{x},\bar{y})$</td></tr>
<tr><td>Property 3</td><td>Relation between Correlation and Regression Coefficients
$r_{xy}=\pm\sqrt{b_{xy}\times b_{yx}}$
r_{xy}, b_{xy}, b_{yx} will always have same sign</td></tr>
</table>

Coefficient of Determination and Non-Determination

Coefficient of Determination Accounted Variance/ Explained Variance	r^2
Coefficient of Non-Determination Unaccounted Variance/ Unexplained Variance	$1-r^2$

Theory MCQs

Chapter 13: Statistical Description of Data

Basics of Statistics - PYQs

		PYQ May 18
(1)	Divided bar chart is considered for	
D	a.	Comparing different components of a variable
	b.	The relation of different components to the table
	c.	(a) or (b)
	d.	(a) and (b)
		PYQ Nov. 18
(2)	Data are said to be _____if the investigator himself is responsible for the collection of the data.	
A	a.	Primary data
	b.	Secondary data
	c.	Mixed of primary and secondary data
	d.	None of these
		PYQ Nov. 18
(3)	A suitable graph for representing the portioning of total into sub parts in statistics is:	
A	a.	A Pie chart
	b.	A pictograph
	c.	An ogive
	d.	Histogram
		PYQ Nov. 20
(4)	The average of salaries in a factory is ₹ 47,000. The statement that the average salary ₹ 47,000 is	
A☆	a.	Descriptive Statistics
	b.	Inferential
	c.	Detailed
	d.	Undetailed
		PYQ Nov. 20
(5)	Statistics cannot deal with _____ data.	
B	a.	Quantitative
	b.	Qualitative
	c.	Textual
	d.	Undetailed
		PYQ Nov. 20
(6)	Sweetness of a sweet dish is:	
A	a.	Attribute
	b.	Discrete variable
	c.	Continuous variable
	d.	Variable
		PYQ Nov. 20
(7)	Census reports are used as a source of_____ date.	

A
a. Secondary
b. Primary
c. Organize
d. Confidential

PYQ Nov. 20

(8) ☆ A
You are an auditor of a firm and the firm earns a profit of ₹ 67,000 you stated to them that the annual profit is ₹ 67,000. This is ____ type of statistics.
a. Descriptive
b. Detailed
c. Non detailed
d. Inferential

PYQ Nov. 20

(9) **C** ☆
The _____ are used usually when we wants to examine the relationship between two variables.
a. Bar Graph
b. Pie Chart
c. Line Chart
d. Scatter Plot

PYQ Nov. 20

(10) **C**
When data are classified according to one criterion, then it is called _____ classification.
a. Quantitative b. Qualitative
c. Simple d. Factored

PYQ Jan. 21

(11) **D**
A bar chart is drawn for
a. Continuous data
b. Nominal data
c. Time series data
d. Comparing different components

PYQ Jan. 21

(12) D
A tabular presentation can be used for
a. Continuous series data
b. Nominal data
c. Time series data for longer period
d. Comparison of Data

PYQ Jan. 21

(13) B
A variable with qualitative characteristic is
a. Quality variable
b. An attribute
c. A discrete variable
d. A continuous variable

PYQ Jan. 21

(14) **A**
The accuracy and consistency of data can be verified by
a. Scrutiny
b. Internal Checking
c. External Checking
d. Double Checking

PYQ Jan. 21

(15) The left part of a table providing the description of rows is called.

C

a. Caption b. Box – head
c. Stub d. Body

PYQ Jan. 21

(16) Sweetness of sweet dish is.

A

a. An attribute
b. A discrete variable
c. A continuous variable
d. A variable

PYQ July 21

(17) _____ Means separating items according to similar characteristics grouping them into various classes:

A

☆

a. Classification
b. Editing
c. Separation
d. Tabulation

PYQ July 21

(18) In graphical representation of data, ideographs are also called as:

☆

D

a. Picto-graphs
b. Asymmetry graphs
c. Symmetry graphs
d. Pictograms

PYQ July 21

(19) A graph that uses vertical bars to represent data is called a:

D

a. Line graph
b. Scatter plot
c. Vertical graphs
d. Bar graph

PYQ July 21

(20) In a graphical representation of data, the largest numerical value is 45, the smallest numerical value is 25. If classes desired are 4 then which class interval is:-

B

a. 45 b. 5
c. 20 d. 7.5

PYQ July 21

(21) Data collected on religion from the census reports are:

D

a. Primary data
b. Unclassified data
c. Sample data
d. Secondary data

PYQ July 21

(22) Data collected on religion from the census reports are:

C

a. Primary data

b. Unclassified data
c. Sample data
d. Secondary data

PYQ July 21

(23) Which of the following diagram is the most appropriate to represents various heads in total cost?
A
a. Pie chart
b. Bar graph
c. Multiple Line chart
d. None

PYQ Dec. 21

(24) A national institute arranged its student's data in accordance with different states. This arrangement of data is known as
B
a. Temporal Data
b. Geographical Data
c. Ordinal Data
d. Cardinal Data

PYQ Dec. 21

(25) Multiple axis line chart is considered when
D
a. There is more than one time series
b. The units of the variables are different
c. In any case
d. If there are more than one time series and unit of variables are different.

PYQ June 22

(26) If data is collected from a census Report. What type of data it is:-
C
a. Time series data
b. Primary data
c. Secondary data
d. Geographical data

PYQ June 22

(27) Sweetness is an
D
a. Attribute b. Quantity
c. Quality d. a or c

PYQ June 22

(28) Which of the following is not a way of Presenting data?
D
a. Tabular form
b. Textual form
c. Graphical form
d. Regression analysis

PYQ June 22

(29) Which of the following does not form characteristics in dividing the data?
☆
D
a. No. of auditors auditing Accounts.
b. No. of files audited by auditor
c. No. of files audited less than 6, less than 5, less than 10
d. File less than, moderate than, higher than

PYQ June 22

(30) Which one is research data?

☆

a. Discrete and Continuous

B

b. Qualitative and Quantitative

c. Processed and Unprocessed

d. Organise and unorganised data

PYQ Dec 22

(31) Which one of the following is a source of primary data?

D

a. Government Records

b. Research Articles

c. Journals

d. Questionnaire filled by Enumerators

PYQ Dec 22

(32) Which is the left part of table providing description of the rows?

C

a. Caption

b. Box Head

c. Stub

d. Body

PYQ Jun 23

(33) The share holding pattern of ABC Ltd. is as follows:

B

Share holders	No. of shares in Millions
Promoter	120
FII	25
DII	20
Govt	20
Public	15

What is the difference between central angles (in degree) for shares held by Promoters and Public, in pie chart?

a. 216

b. 189

c. 180

d. 99

PYQ Jun 23

(34) What does an Ogive curve represent?

A

a. The cumulative frequency and class boundary

b. The frequency and class boundary

c. The frequency and cumulative frequency

d. The frequency and class interval

PYQ Jun 23

(35) The following is the data related to the daily income of 86 persons:

A

Income in ₹	No. of persons:
500-999	15
1000-1499	28
1500-1999	36

2000-2499	7

What is the percentage of persons earning at least ₹ 1,500 per day?

a. 50% b. 45%
c. 40% d. 60%

PYQ Jun 23

(36) For tabulation, 'caption' is
A
a. The upper part of the table
b. The lower part of the table
c. The main part of the table
d. The upper part of a table that describes the rows and sub-rows

PYQ Sep 24

(37) B The secondary data is collected by:
a. Observation method
b. International source like World Bank
c. Interview method
d. Mailed questionnaire method

PYQ Sep 24

(38) B Exit polls are an example of which method of collecting data?

a. Investigation
b. Random sampling
c. Census
d. Quota sampling

PYQ Sep 24

(39) C Numerical data presented in descriptive form are called:

a. Tabular presentation
b. Classified presentation
c. Textual presentation
d. Graphical presentation

PYQ Sep 24

(40) A What type of data is most appropriate for representing using a Pie-chart?

a. Categorical data
b. Continuous data
c. Ordinal data
d. Interval data

Basic of Statistics - MTPs

MTP May 18

(1) Statistics is concerned with
D
a. Qualitative information
b. Quantitative information
c. a or b
d. Both a & b

MTP Nov 18

(3)☆ The technician of graphic presentation is extremely helpful in which of the following
A
a. Analysing the changes at different points of Time
b. Analysing cause and effect relationship
c. Analysing proportional relationship
d. Analysing the degree of relationship

MTP Nov 18

(4) Statistics Analyses:
B
a. Qualitative
b. Quantitative
c. Either Qualitative or Quantitative
d. Quantitative and Qualitative

MTP Nov 19

(11)B The number of times a particular item occurs in a given data is called its
a. Variation
b. Frequency
c. Cumulative Frequency
d. None of these

MTP Nov 20

(12) The most appropriate diagram to represent the data relating to the monthly expenditure on different items by a family is ?
B
a. Histogram
b. Pie-diagram
c. Frequency polygon
d. Line graph

MTP Nov 21

(14)C Which of the following is not an example of continuous variable?
a. Temperature in India
b. Profit of Company X
c. Number of road accidents
d. A person's height

MTP Dec 22 Series II

(20) A suitable graph for representing the portioning of total into sub parts in statistics is:
B
a. A Pictograph b. A Pie Chart
c. An Ogive d. A Histogram

MTP June 2023 Series I

(21) The most accurate mode of data presentation is:
B
a. Diagrammatic b. Tabulation
c. Textual presentation d. None of these

MTP Dec 2023 Series I

(23) A tabular presentation can be used for
D
a. Continuous data
b. Nominal data
c. Time Series data
d. Comparing different components

MTP Dec 2023 Series I

(24) When data are classified according one criterion, then it is called -------classification
C
a. Quantitative b. Qualitative

	c. Simple	d. Factored
		MTP Dec 2023 Series II
(27)	100 students are classified into male/female and graduate/non-graduate classes.	
B	This data classification is	
	a. Cardinal data	
	b. Ordinal data	
	c. Spatial Series data	
	d. Temporal data	
		MTP June 24 Series I
(28)	Which of the following statement is true?	
B	a. Statistics is derived from the French word 'Statistik'	
	b. Statistics is derived from the Italian word 'Statista'	
	c. Statistics is derived from the Latin word 'Statistique'.	
	d. None of these	
		MTP June 24 Series III
(35)C	The pair of averages whose value can be determined graphically.	
	a. Mean and Median	
	b. Mode and Mean	
	c. Mode and Median	
	d. None of these	
		MTP Sep 24 Series I
(37)C	The following set of data cannot be presented in a table	
	a. The heights of students described in centimeters	
	b. The weights of candidates expressed in kilograms	
	c. The amount of rainfall opined as "medium", "average", "heavy", etc.	
	d. The number of bills per day cleared by an auditor in a month	
		MTP 1 Jan 25
(38)	A table has _____ parts	
C	a. Four	
	b. Two	
	c. Five	
	d. None	
		MTP 1 Jan 25
(39)	Column headings are known as	
D	a. Body	
	b. Stub	
	c. Box-Head	
	d. Caption	
		MTP 1 Jan 25
(40)	Arrange the dimensions of Bar diagram, Cube diagram, Pie diagram in Sequence	
C	a. 1, 2, 3	
	b. 2, 1, 3	
	c. 2, 3, 2	
	d. 3, 2, 1	

Frequency Distribution – PYQs

PYQ May 18

(1) Frequency density is used in the construction of

A
a. Histogram
b. Ogive
c. Frequency polygon
d. None when the classes are of unequal width.

PYQ Nov. 18

(2) The following frequency distribution is classified as

B

X	12	17	24	36	45
F	2	5	3	8	9

a. Continuous distribution
b. Simple Frequency Distribution
c. Cumulative frequency distribution
d. None of these

PYQ Nov. 18

(3) Histogram is useful to determine graphically the value of

C
a. Arithmetic mean
b. Median
c. Mode
d. None of these

PYQ Nov. 18

(4) The number of times a particular items occurs in a class interval is called its:

B
a. Mean
b. Frequency
c. Cumulative frequency
d. None of these

PYQ Nov. 18

(5) An ogive is a graphical representation of

A
a. Cumulative frequency distribution
b. A frequency distribution
c. Ungrouped data
d. None of these

PYQ Nov. 18

(6)

Class	0-10	10-20	20-30	30-40	40-50
Freq.	4	6	20	8	3

C

For the class 20-30. Cumulative frequency is:

a. 10 b. 26
c. 30 d. 41

PYQ June 19

(7) Which of the following graph is suitable for cumulative frequency distribution?

A
a. 'O'give b. Histogram
c. G.M d. A.M

PYQ June 19

(8) Histogram can be shown as

B	a.	Ellipse	b.	Rectangle
	c.	Hyperbola	d.	Circle

PYQ June 19

(9) _____Series is continuous.

B
a. Open ended
b. Exclusive
c. Close ended
d. Unequal call intervals

PYQ June 19

(10) Ogive graph is used for finding

C	a.	Mean	b.	Mode
	c.	Median	d.	None of these

PYQ June 19

(11) Histogram is used for finding

A	a.	Mode	b.	Mean
	c.	First quartile	d.	None of these

PYQ Nov. 19

(12) The graphical representation of cumulative frequency distribution is called.

C
a. Histogram
b. Historiagram
c. Ogive
d. None of these

PYQ Nov. 20

(13) Types of cumulative frequencies are:

B	a.	1	b.	2
	c.	3	d.	4

PYQ Jan. 21

(14) From a histogram one cannot compute the approximate value of

B
a. Mode
b. Standard deviation
c. Median
d. Mean

PYQ Jan. 21

(15) Mode can be obtained from_____

B
a. Frequency polygon
b. Histogram
c. Ogive
d. All of the above

PYQ Jan. 21

(16) Most of the Commonly used distributions provide

A
a. Bell – shaped
b. U Shaped
c. J – Shaped Curve
d. Mixed Curve

PYQ Jan. 21

(17) Which of the following is suitable for the graphical representation of a Cumulative frequency distribution?
C
a. Frequency polygon
b. Histogram
c. O give
d. Pie chart

PYQ July 21

(18) Frequency density of a class interval is the ratio of _____.
D
a. Class frequency to the total frequency
b. Class length to class frequency
c. Class frequency to the cumulative frequency
d. Frequency of that class interval to the corresponding class length.

PYQ Dec. 21

(19) Ogive curves are used to determine
B
a. Mean b. Median
c. Mode d. Range

PYQ June 22

(20) Less than 'o' give curve give-
B
a. Mean b. Median
c. Mode d. M D

PYQ June 22

(21) Histogram can be drawn when
D
a. Class interval are equal
b. Class interval are unequal
c. Frequency of class interval are equal
d. None of these

PYQ June 22

(22) If the cumulative frequency are plotted on axis then which type of curve is formed
A
a. Ogive
b. Frequency curve
c. Histogram
d. Frequency Polygon

PYQ Dec 22

(23) The suitable formula for computing the number of class intervals is (N is total frequency)
C
☆
a. 3.322 logN b. 0.322 logN
c. 1 + 3.322 logN d. 1 – 3.322 logN
Note: Out of Syllabus

PYQ Dec 22

(24) Ogive for more than type and less than type distributions intersect at
B
a. Mean b. Median
c. Mode d. Origin

PYQ July 21

(25) The modes of presentation of data are:
C
a. Textual, Diagrammatic and Internal presentation

b. Tabular, Textual and Internal presentation
c. Textual, Tabular and Diagrammtic presentation
d. Tabular, Diagrammatic and Internal Presentation

PYQ Dec 23

(26) B The frequency of visitor in an office is given below:

Time	Frequency
9 AM-11 AM	5
11 AM-1 PM	18
1 PM-3 PM	7
3 PM-5 PM	12

Find the cumulative frequency of visitors for the time 11AM – 1PM?

a. 5 b. 23
c. 18 d. 30

PYQ Dec 23

(27) B By plotting cumulative frequency against the respective class boundary, we get

a. Frequency curve
b. Ogives
c. Frequency polygon
d. Histogram

PYQ Dec 23

(28) B In a cumulative frequency curve, what is represented on the Y-axis?

a. Class interval
b. Cumulative frequency
c. Frequency density
d. Relative frequency

PYQ Dec 23

(29) B In a frequency distribution, the relative frequency of the class is:

a. The ratio of the class frequency to the total number of classes
b. The ratio of the class frequency to the total frequency
c. The ratio of the class frequency to the total number of data points
d. The ratio of the class mid point to the class frequency

PYQ Dec 23

(30) A Frequency density corresponding to a class interval is ratio of:

a. Class frequency to class length
b. Class frequency to total frequency
c. Class frequency to cumulative frequency
d. Class length to class frequency

PYQ Dec 23

(31) A A perpendicular drawn from the point of intersection of two Ogive on the horizontal axis given the value of

a. 2^{nd} Quartile b. 3^{rd} Quartile

c. Mode d. 1st Quartile

PYQ June 24

(32) A less than ogive curve is drawn by plotting
A
a. Less than Cumulative frequencies on the vertical axis
b. More than Cumulative frequencies on the vertical axis
c. Highest frequencies on vertical axis
d. Lowest frequencies on vertical axis

PYQ June 24

(33) Two frequency distributions are given to you. To compare them visually, the best diagram to be drawn on the same sheet is
B
a. Pie chart
b. Histogram
c. Frequency polygon
d. Bar chart

PYQ June 24

(34) A histogram and a pie chart represents the same data on monthly expenses of a household. Which statement is most likely true?
D
a. The histogram only shows the frequency of each expense category, while the pie chart shows the proportion of each category
b. Both the histogram and pie chart show the frequency of each expenses category
c. Both the histogram and pie chart show the proportion of each expenses category
d. Pie charts are always better than histograms for representing expenses

PYQ June 24

(35) The following set of data cannot be presented in a table
C
a. The heights of students described in centimeters
b. The weights of candidates expressed in kilograms
c. The amount of rainfall opined as “medium”, “average”, “heavy”, etc.
d. The number of bills per day cleared by an auditor in a month

PYQ June 24

(36) An ogive is used to represent:
B
a. The frequency of each data point
b. The number of data points falling below a specific value
c. The proportion of data points falling below a specific value
d. The relationship between two variables

PYQ Sep 24

(37) D The Ogive can be used for making
a. Medium term projection
b. Short term projection
c. Long term projection
d. Group frequency distribution

PYQ Sep 24

(38) A The distribution of commuters coming to a Metro station from early morning hours to peak morning hours follows which type of frequency curve?
a. J-shaped curve
b. Bell shaped curve

c. U-shaped curve
d. Mixed Curve

PYQ Sep 24

(39) A Series in which frequencies are continuously added corresponding to each class interval in the series:
a. Cumulative frequency series
b. Frequency
c. Deviation
d. Mid value

PYQ Sep 24

(40) B If the class intervals of certain data are 10-14, 15-19, 20-24, then the first class boundaries is
a. 10-14 b. 9.5-14.5
c. 10-15 d. 10. 5-15.5

Frequency Distribution – MTPs

MTP May 18

(2) A The difference between the upper and lower limit of a class is called
a. Class interval b. Mid value
c. Class boundary d. frequency

MTP May 18

(3) C What is exclusive Series
a. In which both upper and lower limit are not included in class frequency
b. In which lower limit is not included class frequency
c. In which upper limit is not included in class frequency
d. None of the above

MTP Nov 18

(4)☆ A For frequency distribution and time series which form of presentation is rarely used.
a. Diagrammatic presentation
b. Graphic
c. both Diagrammatic and Graphic
d. More information required

MTP Nov 18

(5)A Frequency Polygon is meant for ---------frequency distribution
a. Single
b. Double
c. Multi
d. None of the above

MTP Nov 18

(6) B Ogive is also called as
a. frequency graph
b. cumulative frequency graph
c. Histogram
d. None of these

MTP Nov 18

(7) There are _____ types of frequency curves
D
a. 1 b. 2
c. 3 d. 4

MTP Nov 18

(8) The J shaped curve starts with a _____frequency
A
a. Minimum b. Maximum
c. Either a & b d. none

MTP Nov 18

(9) Mid values are also called
C
a. Lower limit
b. Upper limit
c. Class mark
d. None

MTP May 19 Series II

(12) Mode of a distribution can be obtained from
A
a. Histogram
b. Less than type ogives
c. More than type ogives
d. Frequency polygon

MTP Nov 19

(13) Frequency density is used in the construction of.
A
a. Histogram
b. Ogive
c. Frequency Polygon
d. None of these

MTP May 20

(15) Median of a distribution can be obtained from
C
a. Frequency polygon
b. Histogram
c. Less than type ogives
d. None of these.

MTP March 21

(17)☆ Histogram is used for presentation of the following type of series
B
a. Time Service
b. Continuous Series
c. Discrete Series
d. Individual Series

MTP March 21

(18)D The graphical representation of cumulative frequency distribution is called–
a. Histogram
b. Pie Chart
c. Frequency Polygon
d. Ogive

MTP Apr 21

(20)
B
The following frequency distribution

x	12	17	24	36	45
f	2	5	3	9	8

is classified as-

	a.	Continuous	b.	Discrete
	c.	Cumulative	d.	None of these

MTP Oct 21

(21) A The curve obtained by joining the points, whose x- coordinates are the upper limits of the class-intervals and y coordinates are corresponding cumulative frequencies is called

a. Ogive
b. Histogram
c. Frequency Polygon
d. Frequency Curve

MTP March 22

(23) C For the non-overlapping classes 0—19 , 20—39 , 40—59 the class mark of the class 0—19 is

a.	0	b.	19
c.	9.5	d.	none of these

MTP June 22

(27) B Less than type and more than type Ogives meet at a point known as:

a.	Mean	b.	Median
c.	Mode	d.	None of these

MTP Dec 22 Series II

(34) B _____ Series is continuous.

a. Open ended
b. Exclusive
c. Close ended
d. Unequal class intervals

MTP Dec 22 Series II

(35) D Ogive graph is used for finding:

a.	Quartiles	b.	Deciles
c.	Median	d.	All of these

MTP Dec 22 Series II

(36) B Histogram is useful to determine graphically the value of:

a.	AM	b.	Mode
c.	Median	d.	None of these

MTP June 2023 Series I

(37) B Ogive for more than type and less than distributions intersect at

a.	Means	b.	Median
c.	Mode	d.	Origin

MTP June 2023 Series II

(38) B Perpendicular is drawn from the point of intersection of 2 Ogives on the horizontal axis. The value of x denotes:

a. First Quartile
b. Second Quartile
c. Third Quartile
d. Any of the above

MTP June 2023 Series II

(39) A In study of impact of novel Coronavirus in the world, a frequency graph is plotted for age on the x axis and fatalities on the y axis. Which frequency curve is most expected as the output?

a. J shaped curve
b. U shaped curve
c. Bell shaped curve
d. Mixed shaped curve

MTP Dec 2023 Series II

(41) The graphical representation of Median is calculated:
A a. Ogive Curve b. Frequency Curve
c. Line Diagram d. Histogram

MTP June 24 Series II

(44) The number of times a particular item occurs in a given data is called its
B
a. Variation
b. Frequency
c. Cumulative frequency
d. None of these

MTP June 24 Series II

(47) An Ogive can be prepared in _____ different ways.
A a. 2 b. 3
c. 4 d. 5

MTP June 24 Series III

(48) The difference between the upper and lower limit of a class is called
A a. Class Interval b. Mid Value
c. Class Boundary d. Frequency

MTP June 24 Series III

(49) What is exclusive Series
C a. In which both upper and lower limit are not included in class frequency
b. In which lower limit is not included class frequency
c. In which upper limit is not included in class frequency
d. None of these

MTP Sep 24 Series I

(50) According to the empirical rule, if the data form a "bell-shaped “distribution, then the maximum and minimum frequencies occur at _____ and _____ respectively.
D
a. Middle, left end
b. Middle, right end
c. End, middle
d. Middle, ends

MTP Sep 24 Series II

(52) Which of the following is suitable for cumulative frequency distribution?
A a. Ogive b. Histogram
c. GM d. AM

Sampling - PYQs

PYQ June 24

(1) Which sampling is based on the discretion of the sampler?
D a. Systematic b. Multi-stage

	c.	Stratified	d.	Purposive

PYQ June 24

(2)	Which of the following is not a type of sampling?	
C	a.	Probability
	b.	Non-probability
	c.	Stand-Alone
	d.	Mixed

PYQ Sep 24

(3)	What is the purpose of stratified random sampling?	
A		
	a.	To divide the population into subgroups and then randomly sample from each subgroup
	b.	To ensure that every individual in the population has an equal chance of being selected
	c.	To select individuals based on their availability and convenience
	d.	To select a fixed percentage of the population without any specific criteria

Sampling - MTPs

MTP Sep 24 Series I

(2)	Which of the following is not a type of sampling?	
C		
	a.	Probability
	b.	Non- Probability
	c.	Stand-alone
	d.	Mixed

MTP 1 Jan 25

(3)C	Out of these, which is not a probability sampling?	
	a.	Cluster Sampling
	b.	Stratified Sampling
	c.	Quota Sampling
	d.	Simple Random Sampling

MTP 1 Jan 25

(4)	With the increase in sample size, the error also____	
A	a.	Decreases
	b.	Increases
	c.	Remains Same
	d.	All the Above

MTP 2 - Jan 25

(5)	Standard Error can be described as	
D	a.	The error committed in sampling
	b.	The error committed in a sample survey
	c.	The error committed in estimating parameter.
	d.	Standard deviation of statistic.

Theory MCQs

Chapter 18: Index Numbers

Index Numbers – PYQs

PYQ May 18

(1) Time reversal and factor reversal are:
D
a. Quantity Index
b. Ideal Index
c. Price Index
d. Test of consistency

PYQ May 18

(2) A series of numerical figures which show the relative position is called
A
a. Index number
b. Relative number
c. Absolute number
d. None of these

PYQ May 18

(3) The number of test of Adequacy is:
D
a. 2 b. 5
c. 3 d. 4

PYQ May 18

(4) P_{01} is the index for time
A
a. 1 on 0 b. 0 on 1
c. 1 on 1 d. 0 on 0

PYQ May 18

(5) The circular test is an extension of
A
a. The time reversal test
b. The factor reversal test
c. The unit test
d. None of these

PYQ May 18

(6) Price – relative is expressed in term of
C
a. $P = \frac{P_n}{P_o}$ b. $P = \frac{P_o}{P_n}$
c. $P = \frac{P_n}{P_o} \times 100$ d. $P = \frac{P_o}{P_n} \times 100$

PYQ May 18

(7) Circular test is satisfied by
C
a. Lespeyre's Index Number
b. Paasche's Index Number
c. The simple geometric mean of price relatives and the weighted aggregative with fixed weights

	d. None of these	
		PYQ May 18
(8) **B**	The multiplicative time series model is (from Time Series Topic – deleted from syllabus) a. y = T+S+C+I b. y = TSCI c. y = a+bx d. $y = a + bx + cx^2$	
		PYQ Nov. 18
(9) D	Which of the following statement is true? a. Paasche's Index Number is based on the base year quantity b. Fisher's Index Number is the Arithmetic Mean of Lasperye's Index Number and Paasche's Index Number c. Arithmetic Mean is the most appropriate average for constructing the index number d. Fisher's Index Number is an Ideal Index Number	
		PYQ Nov. 18
(10) C	The simple average method is used to calculate (Time Series Topic – deleted from syllabus) a. Trend Variation b. Cyclical Variation c. Seasonal Variation d. Irregular Variation	
		PYQ Nov. 18
(11) **C**	The sale of Cold Drink would go up in summers and go down in the winters is an example of a. Trend Variation b. Cyclical Variation c. Seasonal Variation d. Irregular Variation	
		PYQ June 19
(12) C	Which is called an ideal index numbers a. Laspeyre's index number b. Passche's index number c. Fisher's index number d. Marshall Edgeworth index number	
		PYQ June 19
(13) C	In semi averages method, if the number of values is odd then we drop: (Time Series Topic – deleted from syllabus) a. First value b. Last value c. Middle value d. Middle two value	
		PYQ June 19
(14) **C**	Which is not satisfied by Fisher's ideal index number? a. Factor Reversal Test b. Time Reversal Test c. Circular Test	

d. None of these

PYQ June 19

(15) Trend in semi average is:
A (Time Series Topic – deleted from syllabus)
a. Linear b. Parabola
c. Exponential d. None of these

PYQ June 19

(16) The most commonly used mathematical method for finding secular trend is
(Time Series Topic – deleted from syllabus)
B a. Moving average
b. Simple average
c. Exponential
d. None of these

PYQ Nov. 19

(17) When sale of cold drink increases in summer and decreases in winters is an example
A of?
a. Seasonal variations
b. Cyclic variations
c. Secular variations
d. None of these

PYQ Nov. 19

(18) Seasonal variations take place within:
A (Time Series Topic – deleted from syllabus)
a. One year b. Two years
c. Half year d. Five years

PYQ Nov. 19

(19) Fisher's index number does not satisfy:
A a. Circular test
b. Time reversal test
c. Factor reversal test
d. Unit test

PYQ Nov. 19

(20) In semi-average method if the no. of values is odd, we exclude:
C (Time Series Topic – deleted from syllabus)
a. First value b. Last value
c. Middle value d. None of these

PYQ Nov. 20

(21) Fisher's ideal index number does not satisfy _____ test
A
a. Circular
b. Time reversal
c. Factor reversal
d. Unit

PYQ Nov. 20

(22) Index numbers are expressed as
C a. Squares b. Ratio
c. Percentages d. Combinations

PYQ Jan. 21

(23) The cost of living index is always
C
a. Price index number
b. Quantity index number
c. Weighted index number
d. Value index number

PYQ Jan. 21

(24) Fisher's index number does not satisfy
B
a. Unit test
b. Circular test
c. Time reversal test
d. Factor reversal test

PYQ Jan. 21

(25) When the prices for quantities consumed of all commodities are changing in the same ratio, then the index numbers due to Laspeyre's and Paasche's will be.
A
☆
a. Equal
b. Unequal
c. Reciprocal of Marshall Edge worth Index Number
d. Reciprocal of Fisher Index Number

PYQ Dec. 21

(26) If P_{10} and P_{01} are index for 1 on 0 and 0 on 1 respec. then formula $P_{01} \times P_{10} = 1$ is used for
B
a. Unit test
b. Time Reversal Test
c. Factor Reversal Test
d. Circular Test

PYQ Dec. 21

(27) The weighted averaged of price relatives of commodities, when the weights are equal to the value of commodities in the current year, yields_____ index number.
C
☆
a. Fisher's ideal
b. Lasperey's
c. Paasche's
d. Marshall-Edgeworth

PYQ Dec. 21

(28) Index numbers are not helpful in
D
a. Framing economics policies
b. Revealing trend
c. Forecasting
d. Identifying errors

PYQ Dec. 21

(29) The three index numbers, namely, Laspeyre, Paasche and Fisher do not satisfy_____ test.
D
a. Time reversal b. Factor reversal
c. Unit d. Circular

PYQ June 22

(30) Geometric mean method used in which index number to find it out

C

a. Laspeyre's
b. Paasche's
c. Fishers index number
d. None of these

PYQ June 22

(31) Which test is known for shift base index no.
C
a. Factor test
b. Unit test
c. Circular test
d. Time reversal test

PYQ June 22

(32) Laspeyre and Paasche do not satisfy -
C
a. Unit test
b. Factor test
c. Time reversal test
d. Bowley's test

PYQ June 22

(33) Laspeyre's index number is based on?
A
a. Last year weight
b. Present year weight
c. Last year value
d. Present year value

PYQ June 22

(34) Price relative is-
A
a. $\frac{P_1}{P_0} \times 100$
b. P
c. P_0
d. P_1 / P_0

PYQ June 22

(35) Which one of the following is not appropriate for calculation of index number?
B
a. Unit test
b. Price relative test
c. Circular test
d. Time reversal test

PYQ Dec 22

(36) Which of the following index measures the change from month to month in the cost of a representative basket of goods and services of the type which are bought by a typical household?
A
☆
a. Retail Price Index
b. Laspeyre's Index
c. Fisher's Index
d. Paasche's Index

PYQ Dec 22

(37) Fisher's index number is called as ideal index number because it is satisfying
C
a. Factor reversal test

b. Time reversal test
c. Both factor and time reversal test
d. Circular test

PYQ Dec 22

(38) A In price index, when a new commodity is required to be added, which of the following index is used?
a. Shifted price index
b. Splicing price index
c. Deflating price index
d. Value price index

PYQ Jun 23

(39) A Which of the below index is computed by taking the average of base year and current year?
a. Marshall-Edgeworth index
b. Paasche's Index
c. Laspeyre's Index
d. Fisher's Index

PYQ Jun 23

(40) A Weighted geometric mean of relative formula satisfies _____ test while Factor Reversal test is satisfied by_____.
a. Time Reversal, Fisher's Ideal Index
b. Time Reversal, Laspeyre's Index
c. Factor Reversal, Paasche's Index
d. Factor Reversal, Fisher's Ideal Index

PYQ Dec 23

(41) B An index number constructed to measure the relative change in the price of an item or a group of item is called:
a. Quantity index number
b. Price index number
c. Volume index number
d. Composite index number

PYQ Dec 23

(42) C Fisher's index does not satisfy following test
a. Unit test
b. Time Reversal test
c. Circular test
d. Factor Reversal test

PYQ June 24

(43) D The average of base year and current years is used in _____ index number
a. Laspeyre's
b. Paasche's
c. Fisher's ideal
d. Marshall-Edgeworth

PYQ June 24

(44) A What index number formula satisfies both the time reversal and factor reversal tests?
a. Fisher's Ideal index

b. Laspeyres index
c. Paasche's index
d. Marshall-Edgeworth index

PYQ June 24

(45) B What of the following is not a test of adequacy in the context of index numbers?

a. Unit test
b. Square test
c. Circular test
d. Factor reversal test

PYQ June 24

(46) b Which index number formula does not satisfy the time reversal test?

a. Fisher's ideal index and Laspeyre's index
b. Laspeyres index and Paasche's index
c. Paasche's index and Fisher's ideal index
d. Laspeyres' index, Fisher's ideal index and Paasche's index

PYQ Sep 24

(47) C Time reversal test is satisfied by:

a. Paasche's method but not Laspeyre's method
b. Laspeyre's method but not Fisher's method
c. Fisher's method
d. Lasperye's method and Fisher's method

PYQ Sep 24

(48) C The value index is equal to:

a. The total sum of the values of a given year plus the sum of the values of the base year
b. The total sum of the values of a given year multiplied by the sum of the values of the base year
c. The total sum of the values of a given year divided by the sum of the values of the base year
d. The total sum of the values of a given year minus the sum of the values of the base year

PYQ Sep 24

(49) C Which one of the following test of adequacy is concerned with the measurement of price changes over a period of years, when it is desirable to shift the base?

a. Time Reversal test
b. Unit test
c. Circular test
d. Factor reversal test

Index Numbers – MTPs

MTP May 18

(1) C The _____ is satisfied when $P_{ab} \times P_{bc} \times P_{ca} = 1$

a. Time reversal test
b. Factor reversal test

	c.	Circular Test		
	d.	none of these		
				MTP May 18
(2)	The number of tests of Adequacy			
C	a.	2	b.	3
	c.	4	d.	5
				MTP Nov 18
(3)	Fishers' Ideal Index number is			
C	a.	The median of Laspyre's and Paasches Index numbers		
	b.	The Arithmetic mean of Laspyres and Paasche's Index numbers		
	c.	The geometric mean of Laspyres and Paasche's Index Numbers		
	d.	None of these		
				MTP Nov 18
(4)	Fishers Ideal Formula satisfies			
B	(1) Unit Test			
	(2) Circular Test			
	(3) Factor Reversal Test			
	(4) Time Reversal Test			
	a.	1 and 2	b.	1, 3 and 4
	c.	1 and 3	d.	1, 2 and 3
				MTP Nov 18
(5)	While construction of Index numbers which of the following has to be considered as point of reference in company various data describing individual behaviour			
B	a.	Selection of weights		
	b.	Base Period		
	c.	Selection of Formulae		
	d.	Choice of variables		
				MTP Nov 18
(6)☆	Which of the options does not contain the proper use of Index numbers			
C	a.	Helpful in policy determination		
	b.	Useful in Forecasting		
	c.	Equally useful in all condition for different purpose		
	d.	Helpful in comparison		
				MTP May 19
(7)B	Weighted G.M. of relative formula satisfy _____test			
	a.	Time Reversal Test		
	b.	Circular test		
	c.	Factor Reversal Test		
	d.	None of these		
				MTP May 19
(10)	Purchasing Power of Money is			
A	a.	Reciprocal of price index number		
	b.	Equal to price index number.		
	c.	Unequal to price index number.		
	d.	None of these.		
				MTP Nov 19
(14)	Circular test is the extension of			
C	a.	Unit test		

b. Factor reversal test
c. Time reversal test
d. None of these

MTP Nov 19

(15) Unit test is not satisfied by
C
a. Fishers Index number
b. Laspyers Index number
c. Simple Aggregative
d. Bowleys Index number

MTP Nov 19

(16) The best average for construction of Index Number is
B
a. AM b. GM
c. HM d. None of these

MTP Nov 21

(24) Which is called an ideal index number
C
a. Laspyres Index number
b. Pasches Index number
c. Fishers Index number
d. Marshall- Edgeworth Index number

MTP Nov 21

(25) The circular test is an extension of
A
a. The time reversal test
b. The factor reversal test
c. The Unit test
d. None of these

MTP March 22

(30) The weighted average of price relatives of commodities when the weight is equal to the value of commodities in base year yields _____index number
B
a. Fisher's Ideal
b. Laspyres
c. Paasches
d. Marshall-Edgeworth

MTP June 22

(31) The number of tests of Adequacy is
C
a. 2 b. 3
c. 4 d. 5

MTP June 22

(32) Fishers Ideal formula for calculating Index number satisfies the
D
a. Unit Test
b. Factor Reversal Test
c. Time reversal Test
d. All of these

MTP June 22

(33) Purchasing power of money is
A
a. Reciprocal of Price index number
b. Equal to Price Index number
c. Unequal to Price Index number

d. None of these

MTP Dec 22 – Series I

(34) The Circular Test is known as:

A

a. $P_{01} \times P_{12} \times P_{20} = 1$

b. $P_{12} \times P_{01} \times P_{20} = 1$

c. $P_{20} \times P_{12} \times P_{01} = 1$

d. $P_{02} \times P_{21} \times P_{12} = 1$

MTP Dec 22 – Series I

(35) Laspeyres index number is a weighted aggregate method by taking _____ as weights.

A

a. The quantity consumed in the base year
b. The quantity consumed in the current year
c. Value of items consumed in the base year
d. Value of items consumed in the current year

MTP Dec 22 – Series II

(36) Which is not satisfied by Fisher's Ideal Index Number?

C

a. Factor Reversal Test
b. Time Reversal Test
c. Circular Test
d. None of these

MTP Dec 22 Series II

(39) Fisher's index number is called as ideal index number because is in satisfies.

C

a. Factor reversal test
b. Time reversal test
c. Both factor and time reversal test
d. Circular test

MTP June 2023 Series I

(40) Which index measures the change from month to month in the cost of a representative basket of goods and services of the type bought by a typical household?

A

a. Retail Price Index
b. Laspeyre's Index
c. Fisher's Index
d. Paasche's Index

MTP June 2023 Series I

(41) In price index, when a new commodity is required to be added, which of the following index is used?

A

a. Shifted price index
b. Splicing price index
c. Deflating price index
d. Value price index

MTP June 2023 Series II

(42) Which test should be considered necessarily to verify the consistency while we select an appropriate index formula

D

	a.	Circular test
	b.	Time reversal test
	c.	Factor reversal test
	d.	Both b and c
		MTP June 2023 Series II
(43)	Circular test is satisfied by which of the following index?	
D		
	a.	Laspeyres index
	b.	Paasche's index
	c.	Fisher's index
	d.	Simple geometric mean of price relatives
		MTP June 2023 Series II
(45)	Fisher's method of calculating the index number is based on the _____	
A	a.	Geometric mean
	b.	Arithmetic mean
	c.	Harmonic mean
	d.	None of these
		MTP Dec 23 Series I/ MTP Sep I
(46)	Fisher index number is _____of Laspyres and Paasches Index Number	
B	a. A.M	b. G.M
	c. H.M	d. None of these
		MTP Dec 2023 Series I/ MTP Sep I
(47)D	Circular test is satisfied by which of the following index?	
	a.	Laspeyres index
	b.	Paasche's index
	c.	Fisher's index
	d.	Simple geometric mean of price relatives
		MTP Dec 2023 Series I
(48)	The cost of index number is always	
C	a.	Price Index number
	b.	Quantity Index number
	c.	Weighted Index number
	d.	Value index number
		MTP Dec 2023 Series II
(49)C	Fisher's ideal formula for calculating index number satisfies the _____	
	a.	Until Test
	b.	Factor Reversal Test
	c.	Both (a) and (b)
	d.	None of these
		MTP June 24 Series I
(53)	Consumer price index is commonly known as	
D	a.	Chain Based index
	b.	Ideal index
	c.	Wholesale price index
	d.	Cost of living index.
		MTP June 24 Series III
(60)	When the product of price index and the quantity index is equal to the corresponding value index then the test that holds is	
C		

	a.	Unit Test	b.	Time Reversal Test
	c.	Factor Reversal Test	d.	None of these

MTP 1 Jan 25

(61) Which of the following statement is true ?
D
a. Paasche's index number is based on base year quantity
b. Fisher's index satisfies the circular test
c. Arithmetic mean is the most appropriate average for constructing the index number
d. Splicing means constructing one continuous series from two different indices on the basis of common base.

Theory MCQs

Chapter 14: Measures of Central Tendency and Dispersion

PYQs

PYQ May 18

(1) If the variables x and z are so related that z = ax+b for each where a and b are constant, then $\bar{z} = a\bar{x} + b$
A
a. True b. False
c. Both d. None of these

PYQ May 18

(2) If each item is reduced by 15 A. M is
A
a. Reduced by 15
b. Increased by 15
c. Reduced by 10
d. None of these

PYQ May 18

(3) The average of a series of overlapping averages, each of which is based on a certain number of item within a series is know as.
A
a. Moving average
b. Weighted average
c. Simple average
d. None of these

PYQ May 18

(6) Which one of the following is not a central tendency?
A
a. Mean Deviation

b. Arithmetic mean
c. Median
d. Mode

PYQ June 22

(16) D When each value does not have equal importance then
a. AM b. GM
c. HM d. Weighted Avg.

PYQ June 24

(20) D According to the empirical rule, if the data form a "bell-shaped" distribution, then the maximum and minimum frequencies occur at _____ and _____ respectively
a. Middle, left end
b. Middle, right end
c. End, middle
d. Middle, ends

PYQ Jan. 21

(12) D Which of the following measure does not possess mathematical properties?
a. Arithmetic mean
b. Geometric mean
c. Harmonic mean
d. Median

PYQ June 24

(23) C Which of the following measure of central tendency will be unaffected if the lowest and highest observation are removed?
a. Mean b. Mode
c. Median d. Range

PYQ June 24

(24) B Which of the following measure of central tendency depends on the position of the observation?
a. Mean
b. Median
c. Mode
d. Harmonic Mean

PYQ Dec. 21

(7) B ☆ One hundred participants expressed their opinion on recommending a new product to their friends using the attributes : most unlikely, not sure, likely, most likely. The appropriate measure of central tendency that can be used here is
a. Mean
b. Mode
c. Geometric mean
d. Harmonic mean

PYQ Sep 24

(9) What is the range of a data set?
B
a. The difference between the mean and median of the data set
b. The difference between the highest and lowest values in the data set
c. The number of data points in the data set
d. The standard deviation of the data set

PYQ Nov. 20

(1) Which of the following measure of dispersion is based on absolute deviations?
C

a. Range
b. S. D
c. Mean deviation
d. Quartile deviation

PYQ Jan. 21

(16) The best statistical measure used for comparing two series is
C

a. Mean absolute deviation
b. Range
c. Coefficient of variation
d. Standard deviation

PYQ Dec 22

(9) _____ is based on all the observations and _____ is based on the central fifty percent of the observations.
B

a. Mean deviation, Range
b. Mean deviation, quartile deviation
c. Range, Standard deviation
d. Quartile deviation, standard deviation

PYQ Sep 24

(16) In which of the following there is no impact of presence of extreme observations?
B

a. Range
b. Quartile deviation
c. Standard deviation
d. Variance

MTPs

MTP March 21

(14) The sum of the squares of deviations of a set of observations has the smallest value, when the deviations are taken from their:
A

a. A.M b. H.M
c. G.M d. None

MTP March 21

(17) Which of the following measures of central tendency cannot be calculated by graphical method?
A

a. Mean b. Mode
c. Median d. Quartile

MTP Oct 21

(26) The algebraic sum of the deviations of a frequency distribution from its mean is always,
C

a. greater than zero
b. less than zero
c. zero
d. a non-zero number

MTP Oct 21

(27) Pooled Mean is also called
C
a. Mean
b. Geometric Mean
c. Grouped Mean
d. none

MTP June 24 Series II

(34) ____ & ____ are called ratio averages:
A
a. H.M & G.M
b. H.M. & A.M
c. A.M. & G.M.
d. None of these

MTP June 2023 Series II

(16) A shopkeeper wants to place an order for t-shirts with the wholesaler based on past sales data. The size he orders will be decided looking at the _____ of past sales data?
a. Mean
b. Median
c. Mode
d. None of the above

MTP June 2023 Series I

(15) Mode is:
C
a. Least frequent value
b. Middle Most value
c. Most frequent Value
d. None of these

MTP Nov 21

(13) Which of the following is not a criteria for ideal measure of central tendency?
A
a. It should be ambiguously defined
b. It should be simple to compute
c. It should be based on all the observations
d. None of these

MTP June 2023 Series I

(8) Which of the following is a correct statement?
C
a. Range is unaffected by the change in origin or change in scale
b. Range is affected by the change in origin or change in scale
c. Range is unaffected by the change in origin but affected by change in scale
d. Range is affected by the change in origin but unaffected by change in scale

MTP Sep 24 Series I

(76) If the same amount is added or subtracted from all the of an individual series then the standard deviation and variance both shall be
B
a. Changed
b. Unchanged
c. Same
d. None of these

Theory MCQs

Chapter 17: Correlation & Regression

PYQs:

PYQ Nov. 19

(4) B If the plotted points in a scatter diagram lie from upper left to lower right, then correlation is

a. Positive b. Negative
c. Zero d. None of these

PYQ Nov. 20

(5) D Scatter diagram does not help us to?

a. Find the type of correlation
b. Identify whether variables correlated or not
c. Determine the linear or non-linear correlation
d. Find the numerical value of correlation coefficient

PYQ July 21

(6) C If the data points of (X, Y) series on a scatter diagram lie along a straight line that goes downwards as X- values move from left to right, then the data exhibit - - - - - - - - - - - - - - - - - correlation.

a. Direct
b. Imperfect indirect
c. Indirect
d. Imperfect direct

PYQ May 18

(2) B Correlation coefficient is _____ of the units of measurements.

a. dependent b. independent
c. both d. none of these

PYQ June 22

(13) B Which of the following is used to find correlation between two qualitative characteristics

a. Karl Pearson
b. Spearman rank correlation
c. Concurrent deviation
d. Scatter diagram

PYQ June 24

(17) D The range of the coefficient of correlation is

a. between -1 and 1
b. between -1 and 1 including 1
c. between -1 and 1 including – 1
d. between -1 and 1 including – 1, 1

PYQ June 24

(7) B Spearman's correlation Coefficient is used to check

a. The scattering of the data
b. The relationship in variables
c. The median of a data
d. The range of a data

PYQ May 18

(1) C In the method of Concurrent Deviations, only the directions of change (Positive direction/Negative direction) in the variables are taken into account for calculation of

a. Coefficient of SD
b. Coefficient of regression

	c.	Coefficient of correlation
	d.	None of these

PYQ June 19

(5)	A.M. of regression coefficient is	
☆	a.	Equal to r
B	b.	Greater than or equal to r
	c.	Half of r
	d.	None of these

PYQ July 21

(17)	The regression coefficients remain unchanged due			
A	a.	Shift to origin	b.	Shift to scale
	c.	Always	d.	Never

PYQ Sep 24

(29)	Which of the following statement is correct?	
B	a.	Regression Coefficients are independent of origin and scale
	b.	Both regression coefficients must be less than unity
	c.	The regression lines of two independent variables are parallel to each other
	d.	If two regression lines coincide with each other, there is no correlation between the variables

PYQ Sep 24

(30)	Which of the following statement is correct regarding limit of the two regression coefficients?	
D	a.	Must be positive
	b.	No limit
	c.	One positive and the other negative
	d.	Product of the regression coefficients must be numerically less than unity

PYQ Sep 24

(5) A	In case of "Insurance companies' profit" and "The number of claims they have to pay", there exists a:	
	a.	Negative correlation
	b.	Positive correlation
	c.	No correlation
	d.	It cannot be predicted

MTPs:

MTP Apr 21

(4)	Price and Demand are the example of	
C	a.	No correlation
	b.	Positive correlation

c. Negative correlation
d. None of these

MTP June 2023 Series II

(11) D A scatter diagram of two variables developing a pattern of multiple circular rings represents which kind of correlation?
a. Positive
b. Negative
c. Curvilinear
d. No correlation

MTP March 2021

(8) B Correlation coefficient r, b_{xy} and b_{yx} are all have ___ signs
a. Different b. Same
c. Both d. None

MTP Dec 23 Series I

(42) C If one regression coefficient is ____ unity, the other must be ____unity
a. more than, more than
b. less than, less than
c. more than, less than
d. positive, negative

MTP June 24 Series III

(51)B If two variables are uncorrelated then regression lines are
a. Parallel
b. Perpendicular
c. Coincident
d. Inclined at 45^o

MTP June 24 Series III

(52)B Correlation coefficient between X and Y will be negative when
a. X and Y are decreasing
b. X is increasing, Y is decreasing
c. X and Y are increasing
d. None