MVS FOUNDATION

FREE NOTES

ECONOMICS (318)

CHAPTERWISE NOTES

ECONOMICS

Sl. No.	Module	Chapters (Public Examination)	Marks
1	**Module 4:** Statistical Tools	L-8 Measures of Central Tendency; L-9 Measures of Dispersion; L-10 Correlation Analysis; L-11 Index Numbers	20
3	**Module 6:** Consumer's Behaviour	L-15 Demand; L-16 Price Elasticity of Demand	14
4	**Module 7:** Producer's Behaviour	L-18 Cost of Production; L-19 Supply; L-20 Price Elasticity of Supply	15
6	**Module 11:** Money, Banking and Govt Budget	L-28 Money and Banking; L-29 Government and the Budget	12

Component	Details	Marks
Public Exam (4, 6, 7,11)	Total Chapters : 11	61
Practical Exam	NA	0
TMA	Tutor Marked Assignment	20
Final Possible Marks		**81 Marks**

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Measures of Central

Introduction

In statistics, to understand large data, it is necessary to convert them into a representative value that can give a correct picture of the entire series. For this purpose, **measures of central tendency** are used, which show the central tendency of the data.

Meaning of Central Tendency

- The measure of central tendency is a statistical measure that provides a value representing all the data of a series.
- It provides a brief description of the entire series.
- This value is generally situated in the middle or around the data.

Definition

- **Central Tendency:** The value which represents the entire data set.

Types of Averages or Measures of Central Tendencies

Main types:

- **Arithmetic Mean**
- **Median**
- **Quartiles**
- Mode Arithmetic mean is called a **mathematical average.**
- The other three are called **positional averages.**

Arithmetic Mean

- It is the most widely used measure of central tendency.
- It is obtained by dividing the sum of all values by their number.

Formula

$$\bar{X} = \frac{\Sigma X}{N}$$

- ΣX = Sum of all values
- N = Total number of values

Calculation of Arithmetic Mean in Individual Series

Methods:

- Direct Method
- Assumed Mean Method

(1) Direct Method

$$\bar{X} = \frac{\Sigma X}{N}$$

(2) Assumed Mean Method

- Assume any value as the **assumed mean (A)**.
- Find the deviation of each value.

$$\bar{X} = A + \frac{\Sigma d}{N}$$

Where,

$$d = (X - A)$$

Arithmetic Mean of Grouped Data

Methods:

- Direct Method
- Assumed Mean Method
- Step-Deviation Method

(1) Direct Method

$$\bar{X} = \frac{\Sigma f X}{\Sigma f}$$

(2) Assumed Mean Method

$$\bar{X} = A + \frac{\Sigma f d}{\mathrm{N}}$$

Where,

$$d = X - A$$

$$\mathrm{N} = \Sigma f$$

(3) Step-Deviation Method

$$\bar{X} = A + \frac{\Sigma f d'}{\Sigma f} \times c$$

Where,

$$d' = \frac{X - A}{c}$$

Arithmetic Mean in Continuous Series

The **mid-point (m)** of the classes is calculated.

Mid-point

$$m = \frac{Upper\ limit + Lower\ limit}{2}$$

Mean

$$\bar{X} = \frac{\Sigma f m}{\Sigma f}$$

Important Characteristics of Arithmetic Mean

- The sum of deviations from the mean is zero.
- It is based on all values.
- The sum of deviations is minimum.
- If all values change, the mean also changes.
- It is a relatively stable measure.

Combined Mean

When the means of different groups are known and the total mean is to be found.

Formula

$$\bar{X} = \frac{N_1 \bar{X}_1 + N_2 \bar{X}_2}{N_1 + N_2}$$

Weighted Arithmetic Mean

When the importance of different values is different.

Formula

$$\bar{X}_W = \frac{\Sigma WX}{\Sigma W}$$

Median

- It is a **positional average**.
- It divides the series into **two equal parts**.

Definition

Median is the value which divides the series into two equal parts.

Median in Individual Series

Steps:

- Arrange the data in order.
- Find the middle value.

Formula

$$Median = \frac{N+1}{2} th\ item$$

Median in Discrete Series

- Find the cumulative frequency.
- Find the position of the middle term.

Formula

$$Median = \frac{N+1}{2}$$

Median in Continuous Series

Formula

$$Median = L + \frac{\left(\frac{N}{2} - cf\right)}{f} \times i$$

Where,

- L = Lower limit of median class
- cf = Cumulative frequency of the preceding class
- f = Frequency of the median class
- i = Class interval

Characteristics of Median

- Not affected by extreme values.
- Also useful in open-ended classes.
- Not based on all values.

Quartiles

- Divides the distribution into **four equal parts**.

Types:

- **Q1 (First Quartile)**
- **Q2 (Median)**
- **Q3 (Third Quartile)**

Formula

$$Q_1 = \frac{k(N+1)}{4}$$

$$Q_3 = \frac{3(N+1)}{4}$$

Mode

The value whose **frequency is highest**.

Definition

Mode is the value which occurs most frequently in the series.

Mode in Individual Series

- The value whose frequency is highest is the mode.

Mode in Discrete Series

- The class whose frequency is highest is the modal class.

Formula

$$Mode = L + \frac{(f_1 - f_0)}{(2f_1 - f_0 - f_2)} \times i$$

Where,

- L = Lower limit of modal class
- f_1 = Frequency of modal class
- f_0 = Frequency of preceding class
- f_2 = Frequency of succeeding class
- i = Class interval

Calculation of Mode in Discrete Series

The following methods are used to find it in a discrete series:

(a) Inspection Method

- The value whose **frequency is highest** is the **mode**.
- In this method, mode is found just by looking at the table.
- This method is useful only when the value with the highest frequency is clear.

(b) Grouping Method

This method is used when:

- Frequencies are irregular.
- The highest frequency is not clear.

In the grouping method:

- Frequencies are arranged into different groups.
- Mode is found by making a **grouping** and **analysis table**.

Calculation of Mode in Continuous Series

To find the mode in a continuous series:

- The class with the highest frequency is called the **modal class**.

Formula for Mode

$$Mode = L + \frac{(f_1 - f_0)}{(2f_1 - f_0 - f_2)} \times i$$

Where,

- **L** = Lower limit of modal class
- $\mathbf{f_1}$ = Frequency of modal class
- $\mathbf{f_0}$ = Frequency of the class preceding the modal class
- $\mathbf{f_2}$ = Frequency of the class succeeding the modal class
- **i** = Class interval

Characteristics of Mode

- It is the **most frequently occurring value** of the series.
- It can also be found by inspection.
- It represents the **trending or popular** value.
- Not based on all values.

Relationship between Mean, Median and Mode

Sometimes the relationship between these three is expressed as follows:

$$Mode = 3\,Median - 2\,Mean$$

Or

$$Mean - Mode = 3\,(Mean - Median)$$

This relationship applies to a **moderately skewed distribution**.

TOP 5 QUESTIONS

Q1. What is meant by central tendency? Name its main measures.

Answer- Central tendency is that statistical measure which provides a value representing a data group. It expresses the entire distribution in a brief form. Its main measures are - **Arithmetic mean, Median, Quartiles, and Mode.**

Q2. What is Arithmetic Mean? State the main methods of its calculation.

Answer- Arithmetic mean is that average which is obtained by dividing the sum of all values by the total number of values. Its main calculation methods are -

- Direct Method
- Assumed Mean Method
- Step-Deviation Method

Q3. Write the definition of Median and state its characteristics.

Answer- Median is the value which divides any distribution into two equal parts. Half the values are less than the median and half are more than it. Its characteristic is that it is not affected by extreme values.

Q4. What are quartiles? State their types.

Answer- Quartiles are the values which divide any distribution into four equal parts. There are mainly three quartiles-

- Q1 (First Quartile)
- Q2 (Second Quartile / Median)
- Q3 (Third Quartile)

Question-5. What is mode? How is mode calculated in a continuous series?

Answer- Mode is the value whose frequency is highest in any series. In a continuous series, the class with the highest frequency is called the modal class and the mode is calculated by the following formula:

$$Mode = L + \frac{(f_1 - f_0)}{(2f_1 - f_0 - f_2)} \times i$$

2

Measures of Dispersion

Introduction

In the previous chapter, we studied the **measures of central tendency** which tell the representative value of a data group. But just knowing the average is not enough, because it is also necessary to know how much spread there is in the data. This spread of data is called **dispersion**.

Meaning of Dispersion

- **Dispersion** is the extent to which values differ from the average of the distribution
- It is a statistical method to measure the spread or scatter of values of a series.

Absolute and Relative Measures of Dispersion

- **Absolute Measure:** When dispersion is expressed in the original unit of the series (like kilograms, rupees), it is called an absolute measure.
- **Relative Measure:** When dispersion is expressed in the form of a percentage or unit-less number, it is called a relative measure or **coefficient of dispersion**. Its use is for comparative study.

Methods of Calculating Dispersion

There are five main methods of measuring dispersion:

1. Range
2. Quartile Deviation
3. Mean Deviation
4. Standard Deviation
5. Lorenz Curve

Range

- The difference between the largest (L) and smallest (S) value in any series is called **range**.
- **Range (R)** = $L - S$

- **Coefficient of Range** = $\frac{L-S}{L+S}$

Quartile Deviation and Inter Quartile Deviation

- **Quartile Deviation:** It is half of the difference between the third quartile (Q3) and the first quartile (Q1).
- **Formula for Quartile Deviation:**

$$Q.D. = \frac{Q_3 - Q_1}{2}$$

- **Coefficient of Quartile Deviation:**

$$\frac{Q_3 - Q_1}{Q_3 + Q_1}$$

Mean Deviation

- **Mean deviation** reveals the difference (deviation) of the values of items from the average through calculation.

Standard Deviation

- **Standard deviation** is the most important and commonly used measure of dispersion, which is denoted by **S.D.** or σ.
- It is dependent on change of origin, not on change of scale.
- **Coefficient of Variation (C.V.):** It is a relative measure of dispersion, which is used in comparing two or more distributions.
- **Formula of C.V.:**

$$C.V. = \frac{\sigma}{\bar{X}} \times 100 \ \ (Where, \bar{X} = Arithmetic\ Mean)$$

Formulas of Standard Deviation in Individual Series:

- **Actual Mean Method:**

$$\sigma = \sqrt{\frac{\Sigma(X - \bar{X})^2}{N}}$$

- **Assumed Mean Method:**

$$\sigma = \sqrt{\frac{\Sigma d^2}{N} - \left(\frac{\Sigma d}{N}\right)^2} \ (Where, d = X - A)$$

- **Direct Method:**

$$\sigma = \sqrt{\frac{\Sigma X^2}{N} - (\bar{X})^2}$$

- **Step Deviation Method:**

$$\sigma = \sqrt{\frac{\Sigma d'^2}{N} - \left(\frac{\Sigma d'}{N}\right)^2} \times c$$

Formulas of Standard Deviation in Continuous Series:

- **Actual Mean Method:**

$$\sigma = \sqrt{\frac{\Sigma f x^2}{\Sigma f}} \ (Where, x = m - \bar{X})$$

- **Assumed Mean Method:**

$$\sigma = \sqrt{\frac{\Sigma f d^2}{\Sigma f} - \left(\frac{\Sigma f d}{\Sigma f}\right)^2} \ (Where, d = m - A)$$

- **Step Deviation Method:**

$$\sigma = \sqrt{\frac{\Sigma f d'^2}{\Sigma f} - \left(\frac{\Sigma f d'}{\Sigma f}\right)^2} \times c$$

Lorenz Curve

- **Lorenz curve** is a graphic (diagrammatic) method to measure dispersion (inequality or spread).

TOP 5 QUESTIONS

Q1. What is dispersion?

Answer- Dispersion is the statistical measure which shows how much the different values of a distribution vary or are spread from their average value (mean).

Q2. What is Range?

Answer- Range is the difference between the largest value (L) and the smallest value (S) of a series. Its formula is:

Range (R) = L - S

Q3. What is the difference between absolute and relative measure?

Answer- Absolute measure is expressed in the original unit of the data (like rupees), while relative measure is unit-less or in percentage (like coefficient of dispersion) and is useful for comparison.

Q4. By which symbol is standard deviation denoted and what is its importance?

Answer- Standard deviation is denoted by the Greek letter Sigma (σ). It is the most scientific, reliable and commonly used measure of dispersion.

Q5. What is a Lorenz curve?

Answer- Lorenz curve is a graphic (diagrammatic) method to measure and show dispersion, especially inequality in the distribution of wealth or income.

3

Correlation Analysis

Introduction

Correlation is a very important tool of statistics that studies the direction and degree of relationship between two or more variables. In economics, **correlation analysis** is very necessary to understand, compare, and forecast the relationship between various variables like demand-supply or income-expenditure.

Meaning of Correlation

- When two variables change in such a way that a change in one variable results in a change in the other variable, it is called **correlation**.
- It is a statistical method to measure the relationship between two or more variables.

Correlation and Cause-and-Effect Relationship

- **Correlation** only shows the relationship between two variables, it is not necessary that there is also a **cause-and-effect relationship** between them.
- Sometimes correlation can also appear by chance or due to the effect of a third factor.

Types of Correlation

- **Positive Correlation:** When two variables change in the same direction (e.g., both increasing or both decreasing).
- **Negative Correlation:** When two variables change in the opposite direction (e.g., one increasing and the other decreasing).
- **Linear Correlation:** When the ratio of change in two variables always remains constant.
- **Non-linear Correlation:** When the ratio of change in two variables does not remain constant.

Degree of Correlation

- **Perfect Correlation:** r = +1 (perfectly positive) or r = -1 (perfectly negative).

- **Absence of Correlation:** r = 0 (no relationship).
- **High degree correlation:** The value of r is between ±0.75 and ±1.
- **Moderate degree correlation:** The value of r is between ±0.25 and ±0.75.
- **Low degree correlation:** The value of r is between 0 and ±0.25.

Methods of Determining Correlation

There are generally three most used methods to measure correlation:

1. Scatter Plot
2. Karl Pearson's Coefficient
3. Spearman's Coefficient

Scatter Plot

- **Scatter plot** is a method of graphically (through points) finding the possible relationship between two variables without any numerical calculation.
- One variable is represented on the X-axis and the other on the Y-axis.
- From the direction of the scatter of points, the degree (high/low) and direction (positive/negative) of correlation is estimated.

Karl Pearson's Coefficient of Correlation

- It provides a clear numerical expression of the measurement of correlation, which is denoted by 'r'.
- It measures the linear relationship between two variables.
- **Covariance:**

$$Cov(X,Y) = \frac{\Sigma(X-\bar{X})(Y-\bar{Y})}{N}$$

- **Formula (Actual Mean Method):**

$$r = \frac{\Sigma xy}{N\sigma_x\sigma_y}$$

$$r = \frac{\Sigma xy}{\sqrt{\Sigma x^2 \times \Sigma y^2}} \ (Where, x = X - \bar{X} \ and \ y = Y - \bar{Y})$$

- **Formula (Assumed Mean Method):**

$$r = \frac{\Sigma dxdy - \frac{(\Sigma dx)(\Sigma dy)}{N}}{\sqrt{\left[\Sigma dx^2 - \frac{(\Sigma dx)^2}{N}\right]\left[\Sigma dy^2 - \frac{(\Sigma dy)^2}{N}\right]}}$$

- **Formula (Direct Method):**

$$r = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{[N\Sigma X^2 - (\Sigma X)^2][N\Sigma Y^2 - (\Sigma Y)^2]}}$$

Spearman's Rank Correlation Coefficient

- This coefficient is based on the **rank** of variables instead of their actual values.
- It is mainly used for qualitative data (like intelligence, beauty, honesty).
- **Formula (when ranks are unequal):**

$$r_s = 1 - \frac{6\Sigma D^2}{N(N^2 - 1)}$$

(Where D = difference in ranks of both series R_1 - R_2, N = total number of items)

TOP 5 QUESTIONS

Q1. What is meant by correlation?

Answer- When the values of two variables change in such a way that a change in one leads to a change in the other in the same or opposite direction, this statistical tendency is called correlation.

Q2. What is the difference between positive and negative correlation?

Answer- When both variables change in the same direction (like increasing income and consumption), it is a positive correlation. When both variables change in opposite directions (like demand decreasing when price increases), it is a negative correlation.

Q3. What is the limit of correlation coefficient (r)?

Answer- The value of the correlation coefficient (r) always stays between -1 and +1. -1 denotes perfect negative correlation, +1 perfect positive correlation, and 0 denotes the absence of correlation.

Q4. What is the Scatter Diagram method?

Answer- Scatter diagram is a simple graphical method to show the relationship between two variables in the form of points on a graph. The direction and degree of correlation are known from the spread of the points (scatter plot).

Q5. When is Spearman's rank correlation coefficient used?

Answer- It is used when the data is qualitative in nature (like intelligence, efficiency) which cannot be measured in numbers, only their rank can be determined.

4

Index Numbers

Introduction

Index number is such an important tool of statistics which measures the relative changes in a variable or group of variables on the basis of time, location or other characteristics. It acts as a guide in economics to understand fluctuations in price level, production, and cost of living and in making economic policies.

Meaning of Index Numbers

- **Index number** is a statistical measure designed to measure changes in a group of variables with reference to time, geographical location or other characteristics.
- It is also called an economic barometer because it measures changes in the state of the economy.
- **Base Year:** The year with which comparison is made (it is considered 0 or 100).
- **Current Year:** The year for which the index number is calculated (it is denoted by 1).

Types of Index Numbers

- **Price Index:** It measures the changes in the prices of goods across different periods (like wholesale and retail price indices).
- **Quantity Index:** It measures the change in the physical quantity of goods produced or consumed in the economy.
- **Value Index:** It measures the change in the total value (price × quantity) of goods in a certain period.

Construction of Index Numbers

There are mainly two methods of constructing index numbers:

1. Simple Index
2. Weighted Index.

Simple (Unweighted) Index

In this, equal importance (weight) is given to all items. It has two methods:

- **Simple Aggregative Method:**

$$P_{01} = \frac{\Sigma P_1}{\Sigma P_0} \times 100$$

$(Where, \Sigma P_1 = sum\ of\ current\ year's\ prices, \Sigma P_0 = sum\ of\ base\ year's\ prices)$

- **Simple Average of Price Relatives Method:**

$$P_{01} = \frac{\Sigma\left(\frac{P_1}{P_0} \times 100\right)}{N}$$

$(Where\ N = total\ number\ of\ items)$

Weighted Index

In this, different weights are given to items according to their importance.

Laspeyres, Paasche and Fisher's Index

These are the three main formulas of the weighted aggregative method:

1. Laspeyres' Index: It uses the **base year's quantity (Q_0)** as weight.

Formula:

$$P_{01} = \frac{\Sigma P_1 Q_0}{\Sigma P_0 Q_0} \times 100$$

2. Paasche's Index: It uses the **current year's quantity (Q_1)** as weight.

Formula:

$$P_{01} = \frac{\Sigma P_1 Q_1}{\Sigma P_0 Q_1} \times 100$$

3. Fisher's Index: It is the geometric mean of Laspeyres' and Paasche's indices. It is considered the **'ideal index'** because it takes into account the quantities of both the base and current years.

Formula:

$$P_{01} = \sqrt{\left(\frac{\Sigma P_1 Q_0}{\Sigma P_0 Q_0}\right) \times \left(\frac{\Sigma P_1 Q_1}{\Sigma P_0 Q_1}\right)} \times 100$$

Some Important Index Numbers

Wholesale Price Index

- **Wholesale price index** measures general changes in the prices of goods sold in the wholesale market in the country.
- It is the main indicator to measure inflation in the economy.

Consumer Price Index

- It is also called the **cost of living index**.
- It measures the change in retail prices which affects the goods consumed by a specific class of consumers (like industrial workers).
- **Formula for Family Budget Method:**

$$CPI = \frac{\Sigma RW}{\Sigma W} (\text{Where, R} = \frac{\text{P}_1}{\text{P}_0} \times 100 \text{ and W} = \text{भार})$$

- **Formula for Weighted Aggregative Method:**

$$CPI = \frac{\Sigma P_1 Q_0}{\Sigma P_0 Q_0} \times 100$$

Index of Industrial Production

- It measures the change in the quantity of production in the industrial sector of the economy (like manufacturing, mining).

Uses of Index Numbers

- **Measurement of Inflation:** Helpful in measuring the increase or decrease in the general level of prices.
- **Policy Making:** Useful in making government policies regarding tax, salary and dearness allowance (DA).
- **Estimation of Purchasing Power:** Helps in measuring the purchasing power of money or real income.
- **Comparative Study:** Helpful in comparing economic development between different times and places.

TOP 5 QUESTIONS

Q1. What are index numbers called?

Answer- An index number is a statistical measure that measures the average relative change in a variable (like price or quantity) on the basis of time, location or other characteristics. It is also called the barometer of the economy.

Q2. What is the difference between base year and current year?

Answer- 'Base year' is the normal year with which comparison is made and its index is always assumed to be 100. 'Current year' is the present year for which we are calculating the change in prices or quantity.

Q3. What is the main difference between Laspeyres' and Paasche's indices?

Answer- Laspeyres' index uses base year quantity (Q_0) as weight, whereas Paasche's index uses current year quantity (Q_1) as weight.

Q4. Why is Fisher's index called an ideal index?

Answer- Fisher's index is the geometric mean of Laspeyres' and Paasche's indices. It is ideal because it gives equal importance to the quantities of both base year and current year (Q_0 and Q_1) as weights.

Q5. What is the main use of Consumer Price Index (CPI)?

Answer- CPI measures changes in retail prices. Its main use is to detect inflation, measure the cost of living of the common man, and determine dearness allowance (DA) and salaries of employees.

5

Demand

Introduction

In economics, **'demand'** is the main basis for understanding consumer behaviour. This chapter explains how much quantity of a good a consumer is willing to buy at different prices, and what is the relationship between price and demand.

Meaning of Demand

- **Demand** refers to those different quantities of a good which a consumer is ready and able to buy at various possible prices in a certain time.
- For an effective demand, desire, **purchasing power (money)** and readiness to spend money are necessary.

Factors Determining Demand

1. Own price of the good: Demand decreases when price increases and demand increases when price decreases.

2. Prices of related goods:

- **Substitute goods:** When the price of one increases, the demand for the other increases (e.g. tea and coffee).
- **Complementary goods:** When the price of one increases, the demand for the other decreases (e.g. car and petrol).

3. Income of the consumer:

- **Normal goods:** Their demand increases when the consumer's income increases.
- **Inferior (Giffen) goods:** Their demand decreases when the consumer's income increases.

4. Tastes and preferences of the consumer: Demand increases when there is a favourable change and decreases when it is unfavourable.

5. Possibilities of future price change: If there is a possibility of a price increase in the future, the current demand for the good increases.

Demand Function

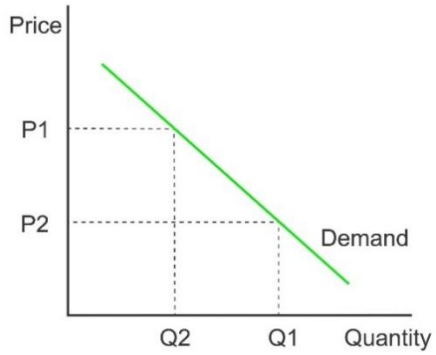
- The demand function shows the functional (mathematical) relationship between the demand for a good and the factors determining it.
- **Formula:**

$$D_x = f(P_x, P_r, Y, T, E)$$

(Where, Dx = demand of the good, f = function, P_x = own price, P_r = price of related goods, Y = income, T = taste, E = future possibilities)

Demand Schedule and Demand Curve

- **Demand Schedule:** This is a table that shows the quantities demanded at various prices in numbers.
- **Demand Curve:** This is the graphical representation of the demand schedule.



- **Individual demand:** Quantity demanded by a single consumer at various prices.
- **Market demand:** Horizontal sum of the quantities demanded by all consumers in the market at various prices.

Law of Demand

- The **Law of Demand** states that 'other things remaining the same', there is an inverse (negative) relationship between the own price of a good and its quantity demanded.
- **Other things remaining the same:** The consumer's income, taste and prices of related goods should remain constant.
- The slope of the demand curve is always downwards from top to bottom towards the right.

Exceptions to the Law of Demand

- Those situations where demand increases when price increases and demand decreases when price decreases (positive slope).
- **Giffen goods:** These are highly inferior goods to which the law of demand does not apply.

- **Prestige goods:** Prestige goods in society which people buy only when their price is high.
- **Ignorance and emergency:** In these situations, the consumer buys more quantity even at a high price.

Movement along the Demand Curve and Shift in the Demand Curve

1. Movement along the demand curve (change in quantity demanded): This happens only due to change in 'own price' of the good.

- **Movement along the demand curve (change in quantity demanded):** This happens only due to change in 'own price' of the good.
- **Movement along the demand curve (change in quantity demanded):** This happens only due to change in 'own price' of the good.

2. Shift in the demand curve (change in demand): This happens due to change in 'other factors' (like income, taste) excluding price.

- **Increase in demand:** Demand curve shifts Rightward.
- **Decrease in demand:** Demand curve shifts Leftward.

TOP 5 QUESTIONS

Q1. What is meant by demand?

Answer- Demand refers to that quantity of a good which a consumer is ready and financially able to buy at various possible prices in a given time period.

Q2. What is the law of demand?

Answer- The law of demand states that keeping all other things constant, there is an inverse (negative) relationship between the price of a good and its quantity demanded. Demand decreases when price increases.

Q3. What are complementary and substitute goods?

Answer- Substitute goods are those which are used in place of each other (like tea-coffee). Complementary goods are those which are used together (like car and petrol).

Q4. What is the difference between expansion of demand and increase in demand?

Answer- Expansion of demand happens only due to a fall in the own price of the good (movement). Whereas an increase in demand happens due to other factors (like increase in income) while price remains the same (shift).

Q5. What are Giffen goods?

Answer- Giffen goods are specific inferior goods to which the law of demand does not apply. Their demand increases when their price rises, and demand decreases when price falls.

6

Price Elasticity of Demand

Introduction

The 'Law of Demand' only tells in which direction demand will change when price changes. But **'Price Elasticity of Demand'** measures exactly how much (quantitatively) the quantity demanded has changed as a result of a change in price. This is extremely important for producers in pricing.

Meaning of Price Elasticity of Demand

- **Price elasticity of demand** is the measure of percentage change in the quantity demanded of a good due to a percentage change in its own price.
- It is a quantitative statement which is denoted by e_d.

Degrees of Price Elasticity of Demand

1. Perfectly elastic demand ($e_d = \infty$): When there is an infinite change in demand even with a very tiny or zero change in price.

2. Perfectly inelastic demand ($e_d = 0$): When price changes by any amount, but there is absolutely no change in quantity demanded (like salt).

3. Unitary elastic demand ($e_d = 1$): When the percentage change in quantity is exactly equal to the percentage change in price.

4. More than unitary elastic demand ($e_d > 1$): When the percentage change in quantity is more than the percentage change in price (this is also called elastic demand).

5. Less than unitary elastic demand ($e_d < 1$): When the percentage change in quantity is less than the percentage change in price (this is also called inelastic demand).

Methods of Measuring Price Elasticity of Demand

1. Percentage or Proportionate Method:

- **Formula:**

$$e_d = (-)\frac{Percentage\ change\ in\ quantity\ demanded}{Percentage\ change\ in\ price}$$

- **Mathematical form:**

$$e_d = (-)\frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

(Where, ΔQ = change in quantity, ΔP = change in price, P = initial price, Q = initial quantity. The negative sign denotes the inverse relationship.)

2. Total Expenditure Method:

- In this method, it is observed what directional change has occurred in the **total expenditure** (Total Expenditure = P × Q) incurred on the good when the price changes.
- If price and total expenditure change in opposite directions, then $e_d > 1$ (elastic).
- If total expenditure remains the same (constant) when price changes, then $e_d = 1$ (unitary elastic).
- If price and total expenditure change in the same direction, then $e_d < 1$ (inelastic).

3. Geometric or Point Method:

It is used to measure elasticity at a specific point on a straight-line demand curve.

Formula:

$$e_d = \frac{Lower\ Segment\ of\ demand\ curve}{Upper\ Segment\ of\ demand\ curve}$$

Factors Determining Price Elasticity of Demand

1. **Availability of substitute goods:** Goods which have many substitutes available have a more elastic demand.
2. **Nature of the good:** The demand for essential goods (like life-saving drugs) is inelastic and the demand for luxury goods (like cars) is elastic.
3. **Proportion of consumer's income spent:** Goods on which a very small part of income is spent (like matchbox), their elasticity is low (inelastic).
4. **Different uses of the good:** Goods which have multiple uses (like electricity, milk), their demand is more elastic.
5. **Time period:** Demand is less elastic in the short run and more elastic in the long run.

TOP 5 QUESTIONS

Q1. Define price elasticity of demand.

Answer- Price elasticity of demand is a numerical and quantitative measure of the percentage change in the quantity demanded of a good as a result of a percentage change in its price.

Q2. What is called perfectly inelastic demand?

Answer- When there is no change in the quantity demanded of a good despite a huge change (decrease or increase) in its price, it is called perfectly inelastic demand ($e_d = 0$).

Q3. According to the total expenditure method, when is demand unitary elastic ($e_d = 1$)?

Answer- When the total expenditure made by the consumer on that good remains completely constant or unchanged whether the price of the good decreases or increases, the elasticity of demand is equal to unity.

Q4. What is the formula of Geometric (Point) method?

Answer- The formula for measuring elasticity at any point on a straight line demand curve is:

$$e_d = \frac{Lower\ Segment\ of\ demand\ curve}{Upper\ Segment\ of\ demand\ curve}$$

Q5. How does the availability of substitute goods affect the elasticity of demand?

Answer- If close substitutes of a good are available in the market (like tea and coffee), its demand is more elastic ($e_d > 1$), because when the price increases, consumers can easily switch to the other good.

7

Cost of Production

Introduction

In economics, the study of **'cost of production'** is the main basis of a producer's decision-making process. This chapter explains what expenses are included in the manufacturing of goods and how various costs (fixed, variable, average, and marginal costs) change when the quantity of production changes.

Meaning of Cost

Cost: The total sum of all types of expenses incurred on the production of a good is called the cost of production.

Explicit and Implicit Costs

- **Explicit Costs:** These are the cash payments made by a producer to outsiders for the purchase of factor services or raw materials (e.g., wages, expenditure on raw material).
- **Implicit Costs:** These are the estimated costs of factors owned and self-employed by the producer (e.g., interest on the producer's own capital).
- **Total Economic Cost:** This is the sum of explicit costs, implicit costs, and normal profit.

Short Run and Long Run

- **Short Run:** This is the time period in which some factors of production are fixed and some are variable. Production can only be increased by increasing the variable factors.
- **Long Run:** This is the time period in which all factors of production become variable and no factor remains fixed.

Short Run Costs

- **Total Fixed Cost (TFC):** This is the expenditure incurred on fixed factors (e.g., machines, buildings). It does not become zero even when production is zero and remains the same when production changes.
- **Total Variable Cost (TVC):** This is the expenditure incurred on variable factors (e.g., raw material, daily wage labourers). It is zero when production is zero and increases as production increases.
- **Total Cost (TC):** This is the sum of total fixed cost and total variable cost.

  Formula: $TC = TFC + TVC$

Average Costs (AC)

- **Average Fixed Cost (AFC):** This is the fixed cost per unit. As production increases, it continuously decreases but never becomes zero.

  Formula:

$$AFC = \frac{TFC}{Q} \ (Where, Q = quantity\ of\ production)$$

- **Average Variable Cost (AVC):** This is the variable cost per unit. It initially decreases, becomes minimum, and then starts increasing (it is U-shaped).

  Formula:

$$AVC = \frac{TVC}{Q}$$

- **Average Total Cost (AC):** This is the total cost per unit. This is also U-shaped.

  Formula:

$$AC = AFC + AVC \ or \ AC = \frac{TC}{Q}$$

Marginal Cost

- **Marginal Cost (MC):** The addition made to the total cost (TC) by producing one additional unit of output is called marginal cost.
- It depends only on variable cost (TVC), not on fixed cost (TFC).
- **Formula:**

$$MC_n = TC_n - TC_{n-1}$$

- **Alternative Formula:**

$$MC = \frac{\Delta TC}{\Delta Q}$$

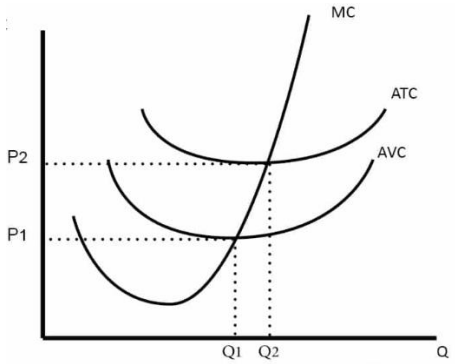
Relationship Between Cost Curves

1. Relationship between AC and MC:

- When AC decreases, MC < AC (MC curve is below the AC curve).
- When AC is minimum, MC = AC (MC curve cuts AC at its minimum point).
- When AC increases, MC > AC (MC curve is above the AC curve).

2. Relationship between AVC and MC:

MC curve cuts AVC curve also at its minimum point from below.



TOP 5 QUESTIONS

Q1. What is the difference between explicit and implicit costs?

Answer- Explicit costs are cash payments given to outsiders for their services (like workers' salary). Implicit costs are the estimated costs of the producer's own factors (like the estimated rent of his own building).

Q2. What is the main difference between total fixed cost (TFC) and total variable cost (TVC)?

Answer- TFC does not depend on the quantity of production; it has to be paid even if production is zero (like rent). TVC changes with the quantity of production and becomes zero when production is zero (like cost of raw material).

Q3. Why does the average fixed cost (AFC) curve never touch the X-axis?

Answer- Because total fixed cost (TFC) is never zero. Therefore, no matter how much the quantity of production (Q) increases, AFC (TFC/Q) continuously decreases, but can never be zero or negative.

Q4. What is meant by Marginal Cost (MC)? Write its formula.

Answer- The increase in total cost due to producing one additional unit of a good is called marginal cost (MC). Its formula is:$MC_n = TC_n - TC_{n-1}$

Q5. State the relationship between AC and MC when AC is at its minimum point.

Answer- When average cost (AC) is at its minimum point, then marginal cost (MC) is exactly equal to the average cost (MC = AC). In the diagram, the MC curve cuts the AC curve from below at this very minimum point.

8

Supply

Introduction

In economics, the study of **'supply'** is extremely important to understand the behaviour of the producer. This chapter explains how much quantity of a good a producer is willing to sell in the market at various possible prices and what is the direct relationship between price and quantity supplied.

Meaning of Supply

- **Supply** refers to those different quantities of a good which a producer is willing to sell at various possible prices in a given time period.
- For supply, both the producer's willingness to sell the good and his ability (availability) are necessary.

Difference Between Stock and Supply

- **Stock:** This is the total quantity of a good which is available in the godown with the producer for sale at a particular point of time.
- **Supply:** This is that part of the stock which the producer actually brings to the market to sell at a given price in a given time period.

Factors Determining Supply

- **Own price of the good:** When price is high, supply is high and when price is low, supply is low.
- **Prices of related goods:** When prices of other (substitute) goods increase, the production of the main good becomes less profitable, due to which its supply decreases.
- **Prices of factors of production (cost):** When raw material or wages become expensive, production cost increases, reducing both the profit margin and supply.
- **State of technology:** Using advanced and new technology reduces the per unit cost, thereby increasing supply.
- **Government policy (taxes and subsidies):** Supply decreases when excise duty (Tax) increases and supply increases when the cost decreases due to receiving economic assistance (Subsidy).

Supply Function

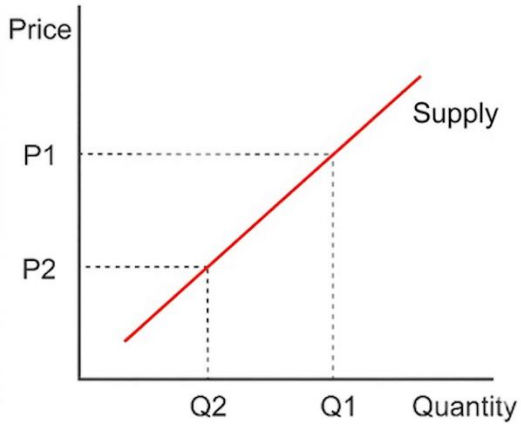
- The **supply function** shows the functional (mathematical) relationship between the supply of a good and various factors determining it.
- **Formula:**

$$S_x = f(P_x, P_r, P_f, T, G)$$

(Where S_x = supply of the good, f = function, P_x = own price, P_r = price of related goods, P_f = prices of factors/cost, T = technology, G = government policy)

Supply Schedule and Supply Curve

- **Supply Schedule:** This is a table that shows the quantities sold in the market at various prices in numbers.
- **Supply Curve:** This is the graphical representation of the supply schedule.



- **Individual Supply:** Quantity sold by a single firm at various prices.
- **Market Supply:** Horizontal sum of the quantities sold by all producers (firms) in the market at various prices.

Law of Supply

- The **Law of Supply** states that 'other things remaining the same', there is a direct (positive) relationship between the own price of a good and its quantity supplied.
- When price increases, supply increases and when price decreases, supply decreases. Therefore, the slope of the supply curve is always upwards from bottom to top towards the right.

Movement along the Supply Curve and Shift in the Supply Curve

1. Movement along the supply curve (change in quantity supplied): This happens only due to change in 'own price' of the good.

- **Expansion of supply:** Increase in quantity when price rises (moving upwards on the same curve).
- **Contraction of supply:** Decrease in quantity when price falls (moving downwards on the same curve).

2. Shift in the supply curve (change in supply): This happens due to change in 'other factors' (like technology, cost) excluding price.

- **Increase in supply:** Supply curve shifts Rightward.
- **Decrease in supply:** Supply curve shifts Leftward.

TOP 5 QUESTIONS

Q1. What is meant by supply?

Answer- Supply means that quantity of a good which a seller (producer) is willing to sell in the market at various possible prices in a given time period.

Q2. What is the difference between stock and supply?

Answer- Stock is the total quantity that is available for sale at a point in time. Whereas supply is that part of the stock which is presented to be sold in the market at a given price.

Q3. What is the law of supply?

Answer- The law of supply states that keeping all other things (cost, technology, etc.) constant, there is a direct (positive) relationship between the price of a good and its quantity supplied. When price increases, supply increases.

Q4. What is the effect of an improvement in technology on supply?

Answer- An improvement in technology or use of advanced technology reduces the per unit cost of production of a good. A decrease in cost increases the producer's profit, as a result of which supply in the market increases.

Q5. What is the difference between expansion of supply and increase in supply?

Answer- Expansion of supply happens only due to an increase in the own price of the good (movement on the same curve). Whereas an increase in supply happens due to other factors (like reduction in taxes or advanced technology) while the price remains the same (rightward shift of the curve).

9

Price Elasticity of Supply

Introduction

The law of supply only tells in which direction supply will change when price changes. But **'price elasticity of supply'** measures exactly how much (quantitatively) the quantity supplied has changed as a result of a change in price. This is extremely important for producers.

Meaning of Price Elasticity of Supply

- **Price elasticity of supply** is a numerical measure of the percentage change in the quantity supplied of a good as a result of a percentage change in its price.
- It is denoted by e_s.

Degrees of Elasticity of Supply

1. Perfectly elastic supply ($e_s = \infty$): When there is an infinite change in supply even with no change or a very tiny change in price.

2. Perfectly inelastic supply ($e_s = 0$): When price changes by any amount, but the quantity supplied remains completely constant (like agricultural products in the short run).

3. Unitary elastic supply ($e_s = 1$): When the percentage change in supply is exactly equal to the percentage change in price.

4. More than unitary elastic supply ($e_s > 1$): When the percentage change in supply is more than the percentage change in price (this is also called elastic supply).

5. Less than unitary elastic supply ($e_s < 1$): When the percentage change in supply is less than the percentage change in price (this is also called inelastic supply).

Methods of Measuring Price Elasticity of Supply

1. Percentage or Proportionate Method:

- **Formula:**

$$e_s = \frac{Percentage\ change\ in\ quantity\ of\ supply}{Percentage\ change\ in\ price}$$

- **Mathematical form:**

$$e_s = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

(Where, ΔQ = change in quantity, ΔP = change in price, P = initial price, Q = initial quantity. Unlike demand, the sign here is positive because the relationship is direct.)

2. Geometric or Point Method:

- It is a graphic method to measure elasticity on a straight-line supply curve.
- If the supply curve originates from the **Origin (O)**, then $e_s = 1$
- If the supply curve originates from the **Y-axis**, then $e_s > 1$
- If the supply curve originates from the **X-axis**, then $e_s < 1$

Factors Determining Elasticity of Supply

- **Time period:** Supply is less elastic (inelastic) in the short run because factors of production are fixed, while supply is more elastic in the long run.
- **Nature of production:** The supply of agricultural goods is usually inelastic (dependence on nature), while the supply of industrial goods is more elastic.
- **Change in cost of production:** If the cost increases very rapidly upon increasing production, then supply will be less elastic.
- **Future price possibilities:** If there is a possibility of price increasing further in the future, then the current supply of the good becomes less elastic.

TOP 5 QUESTIONS

Q1. What is meant by price elasticity of supply?

Answer- Price elasticity of supply is a numerical and quantitative measure of the percentage change in the quantity supplied of a good due to a percentage change in its price.

Q2. What is called perfectly inelastic supply?

Answer- When there is no change in the quantity of supply of a good despite a huge increase or decrease in its price (quantity remains constant), it is called perfectly inelastic supply ($e_s = 0$).

Q3. According to the geometric method, what is the identification of unitary elastic ($e_s = 1$) supply?

Answer- According to the geometric method, if a straight line supply curve passes exactly through the middle of the graph, that is, through the Origin ('O'), then the elasticity of supply at every point of that curve is always equal to unity ($e_s = 1$).

Q4. How does time period affect the elasticity of supply?

Answer- Time period has a direct effect on elasticity. In the short run, factors of production cannot be easily changed, therefore supply is inelastic. In the long run, all factors can be changed, therefore supply becomes more elastic.

Q5. What is the formula to calculate elasticity of supply (e_s) by percentage method?

Answer- The formula for the percentage method is:

$$e_s = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

(Where, ΔQ is change in quantity, ΔP is change in price, P is initial price, and Q is initial quantity. Unlike demand, the sign here is positive because the relationship is direct.)

10

Money and Banking

Introduction

Money and banking is one of the most important subjects of economics. This chapter explains the difficulties of the barter system, the origin of money, its functions, and the important role of banks (commercial and central bank) in the economy along with the methods of credit control.

Barter System

- Barter system is that arrangement in which goods are exchanged directly for goods without money.
- **Difficulties:** Lack of double coincidence of wants, lack of common measure of value, difficulty in storing wealth, and problem in future payments.

Meaning of Money

- **Money** is any thing which has general acceptance in the society as a medium of exchange, a measure of value, and for the payment of debts.

Functions of Money

Primary Functions:

- **Medium of exchange:** It makes the buying and selling of goods and services easy.
- **Measure of value:** The value (price) of every good is expressed in terms of money.

Secondary Functions:

- **Standard of deferred payments:** Making credit transactions and future payments possible.
- **Store of value:** Saving purchasing power for future needs.

Supply of Money

1. The supply of money is the total quantity of money available with the public of a country at a specific point in time. It is a stock concept.

2. Measurement of money supply in India (According to RBI):

- **M_1 (Narrow money)** = Currency with the public (C) + Demand deposits in banks (DD) + Other deposits with RBI (OD)
- **M_2** = M_1 + Savings deposits in post office savings banks
- **M_3 (Broad money)** = M_1 + Net time deposits of commercial banks
- **M_4** = M_3 + Total deposits of post office savings organizations (excluding national savings certificates)

Commercial Banks

- A **commercial bank** is that financial institution which accepts deposits from the public with the objective of earning profit and provides loans for consumption and investment.
- **Major functions:** Accepting deposits (current, savings, fixed accounts), giving loans, and providing agency services (like cashing checks, paying bills).

Credit Creation by Commercial Banks

- Commercial banks increase the supply of money in the economy by giving loans many times more than their initial deposits. This is called **credit creation**.
- This depends on the Legal Reserve Ratio (LRR).
- **Credit Multiplier** = $\frac{1}{LRR}$
- **Total Credit Creation** = Initial Deposit × Credit Multiplier

Central Bank

Central Bank is the supreme banking institution of the country which controls, directs, and regulates the entire monetary and banking system (in India, it is the **Reserve Bank of India; RBI**).

Functions of Central Bank

- **Monopoly of issuing notes:** The sole right to print currency notes in the country.
- **Banker to the government:** Management of the government's accounts and giving it financial advice.
- **Banker's bank and supervisor:** Keeping cash reserves of all commercial banks and giving them guidelines.
- **Lender of last resort:** Providing loans to commercial banks during times of crisis.

Credit Control by Central Bank

Quantitative Measures: (These control the total volume of credit.)

- **Bank Rate:** The rate at which the central bank gives long-term loans to commercial banks. (It is increased during inflation).
- **Repo Rate:** The rate at which the central bank gives short-term loans to commercial banks.
- **Cash Reserve Ratio (CRR):** That minimum percentage of total deposits which is mandatory for commercial banks to keep in cash form with the RBI.
- **Statutory Liquidity Ratio (SLR):** That percentage of total deposits which banks have to keep with themselves in liquid form.
- **Open Market Operations:** Buying and selling of government securities in the market by the RBI.

Qualitative Measures: (These determine the direction of credit.)

- **Margin Requirement:** The difference between the value of the security and the loan amount granted.

TOP 5 QUESTIONS

Q1. What was the biggest difficulty of the barter system?

Answer- Its biggest difficulty was the 'lack of double coincidence of wants'. This means that a transaction was possible only when both persons were ready to want each other's goods, which was not always possible.

Q2. What is the formula for the M_1 supply of money?

Answer- M_1 = Currency with the public (C) + Demand deposits of people in commercial banks (DD) + Other deposits with the Reserve Bank (OD). This is the most liquid measure of money supply.

Q3. State one main difference between a commercial bank and a central bank.

Answer- Commercial banks transact with the general public with the objective of earning profit (like accepting deposits). Whereas the central bank is the supreme institution of the country which does not deal directly with the public, rather it works with other banks and the government.

Q4. What is the Credit Multiplier?

Answer- Credit multiplier measures how many times banks can generate new credit (loans) based on their initial deposits. Its formula is 1/LRR (Legal Reserve Ratio).

Q5. What is the Repo Rate?

Answer- Repo rate is that interest rate at which the central bank of the country (RBI) provides loans to commercial banks to fulfill their short-term needs.

11

Government and the Budget

Introduction

In a modern economy, the **'government budget'** is an important tool of the government's fiscal policy. This chapter explains how the government prepares the statement of its estimated income and expenditure, and how it achieves objectives like economic development and equal distribution of income through it.

Meaning of Government Budget

- A **government budget** is an annual financial statement of the estimated receipts (income) and estimated expenditure (spending) of the government during a financial year (1st April to 31st March in India).

Objectives of Government Budget

- **Encouragement to economic development:** Increasing the rate of economic development of the country by investing in infrastructure (like roads, electricity).
- **Redistribution of income and wealth:** Reducing the inequality between the rich and the poor through taxes and economic assistance (subsidies).
- **Economic stability:** Maintaining stability in the economy during times of recession and inflation.
- **Reallocation of resources:** Encouraging the production of socially useful goods and imposing heavy taxes on harmful goods (like tobacco).

Components of the Budget

There are mainly two parts of the budget:

1. Budget Receipts
2. Budget Expenditure.

Revenue Receipts

- These are those receipts of the government which neither create any **liability** for the government nor cause any reduction in its **assets**.
- **Tax revenue:** Income tax, corporate tax, excise duty, Goods and Services Tax (GST), etc.

- **Non-tax revenue:** Fees, fines, dividends received from public enterprises, and interest receipts, etc.

Capital Receipts

- These are those receipts of the government which either **create a liability** for the government (like taking loans) or cause a **reduction in its assets** (like disinvestment).
- **Main sources:** Recovery of loans, borrowing (from the public or RBI), and disinvestment of public sector enterprises.

Budget Expenditure

It is divided into two parts:

Revenue Expenditure

- This is that expenditure of the government which neither **creates any asset** nor causes a **reduction in any liability** of the government.
- **Examples:** Salaries of government employees, pensions, payment of interest on loans, and economic assistance (subsidies).

Capital Expenditure

- This is that expenditure of the government which either **creates assets** (like building a school or hospital) or causes a **reduction in the liability** of the government (like repayment of old loans).

Budget Deficit

When the total estimated expenditure of the government exceeds its total estimated receipts, that situation is called a **budget deficit**. There are three main types of it:

Revenue Deficit

- It is the excess of total revenue expenditure of the government over its total revenue receipts.
- **Formula:** Revenue Deficit = Revenue Expenditure - Revenue Receipts

Fiscal Deficit

- It is the excess of total expenditure over total receipts (excluding borrowings). It shows the total borrowing requirements of the government.

- **Formula:** Fiscal Deficit = Total Expenditure - (Revenue Receipts + Non-debt Capital Receipts)

Primary Deficit

- Primary deficit is obtained by subtracting the 'interest payments' to be made on past loans from the fiscal deficit.
- Formula: Primary Deficit = Fiscal Deficit - Interest Payments

TOP 5 QUESTIONS

Q1. What is meant by a government budget?

Answer- A government budget is a detailed annual financial statement of the estimated receipts (income) and estimated expenditures (spending) of the government during a financial year, which is presented in the parliament.

Q2. What are revenue receipts?

Answer- Revenue receipts are those incomes of the government from which neither any financial liability increases on the government nor is there any reduction in any of its assets, like tax receipts and fines.

Q3. What is the main difference between revenue expenditure and capital expenditure?

Answer- Revenue expenditure does not create any asset (like payment of salary). Whereas capital expenditure creates new assets (like building a hospital or road) or reduces old liabilities.

Q4. What is called Fiscal Deficit?

Answer- When the total expenditure of the government exceeds all its total receipts excluding borrowings, it is called fiscal deficit. It shows how much total borrowing the government requires.

Q5. What is the importance of primary deficit and what is its formula?

Answer- Primary deficit tells how much deficit the current policies of the government have (it does not include the interest on old loans). Its formula is: Primary Deficit = Fiscal Deficit - Interest Payments