LATEST EDITION

CBSE

QUESTION & CONCEPT BANK

Chapter-wise & Topic-wise

CLASS 11

Chapter-wise
CONCEPT MAPS

Definitions & Summarized Concepts
NCERT & SMART SNAPS

Important Questions & MCQ's
POWER PRACTICE

INTRODUCTORY MICROECONOMICS

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Chapter

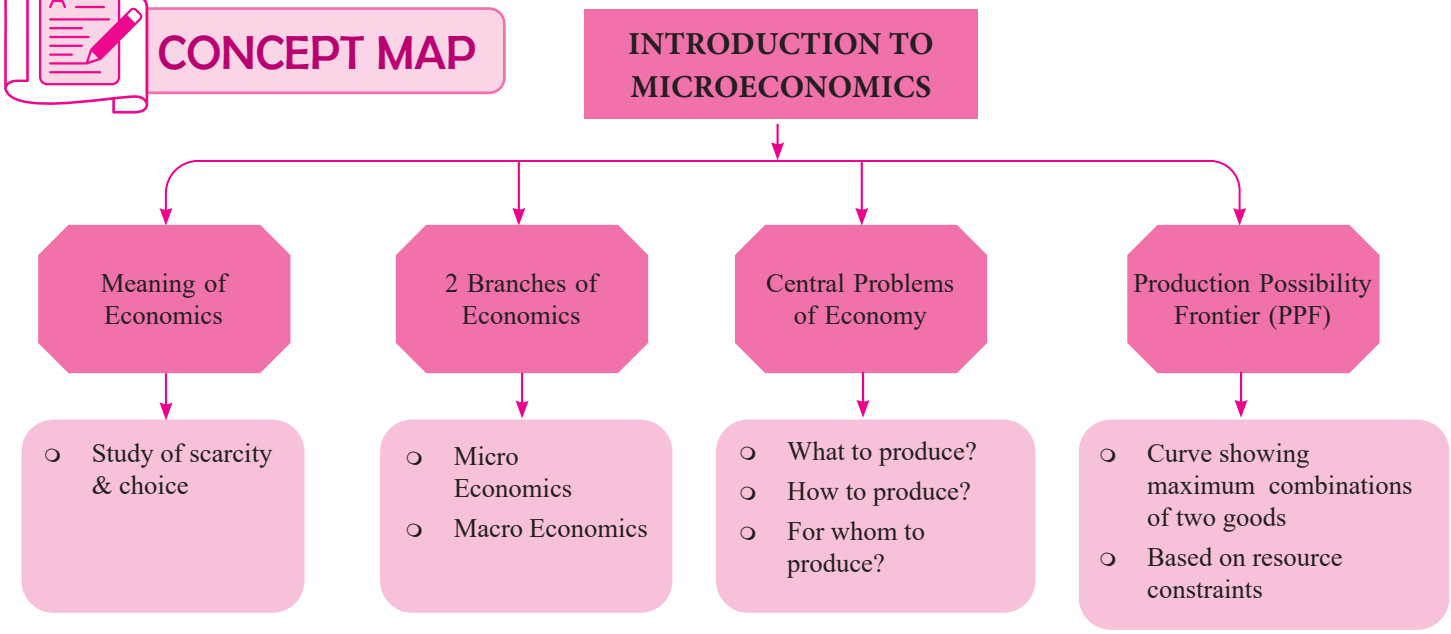
1

INTRODUCTION TO MICRO-ECONOMICS

LEARNING OBJECTIVES

- Understand the meaning of **microeconomics.**
- Distinguish between **microeconomics and macroeconomics.**
- Identify the **central problems of an economy.**
- Explain the concept of **opportunity cost.**
- Understand the **Production Possibility Frontier (PPF).**

CONCEPT MAP



1. Meaning of Economics

Economics is the study of how people make choices under conditions of scarcity. It involves allocating limited resources to satisfy the seemingly unlimited human wants.

Positive and Normative Economics

Basis	Positive Economics	Normative Economics
Meaning	It deals with **what is** – facts and cause-effect relationships.	It deals with **what ought to be** – opinions and value judgments.
Nature	Descriptive	Prescriptive
Objectivity	Objective and fact-based	Subjective and opinion-based
Use	Explains economic behavior	Gives suggestions for economic policies
Example	"India's unemployment rate is 7.8%."	"The government should reduce unemployment."

2. Microeconomics vs. Macroeconomics

- Microeconomics examines individual economic units, including consumers, firms, and markets.
- Macroeconomics deals with the economy as a whole—topics like national income, inflation, and unemployment.

3. Central Problems of an Economy

Every economy faces three fundamental problems due to limited resources:

1. **What to produce?**
   Choosing which goods and services to produce and in what quantity.
2. **How to produce?**
   Deciding on the technique of production—labour-intensive or capital-intensive.
3. **For whom to produce?**
   Determining the distribution of goods—who will consume how much?

4. Causes of Economic Problems

(A) Scarcity of Resources

- Resources like land, labour, capital, and raw materials are limited in supply.
- However, these limited resources must meet the competing demands of the economy.
- Because supply is scarce and cannot fulfill all human wants, economic problems arise.

(B) Unlimited Human Wants

- Human desires for goods and services are never-ending and keep increasing over time.
- As soon as one want is satisfied, another takes its place, creating continuous demand.
- Since resources are limited, not all wants can be fulfilled, causing the need for choice and prioritization.

(C) Alternative Uses of Resources

- Most resources can be used for multiple purposes (e.g., land can be used for farming, building, or industry).
- This leads to the problem of deciding how to allocate resources for maximum satisfaction best.
- Choosing one use means sacrificing another, which creates the core of economic decision-making.

5. Opportunity Cost

- It refers to the value of second best alternative use of a commodity.
- **Example:** If a person have two job options i.e. either to earn 10000 in job one or to earn 9000 in job two then 9000 will be the opportunity cost of choosing job one.

6. Economy and Its Types

An economy is a system through which people earn their living. Types of economies include:

(A) Capitalist Economy (Market-Based)

- In a capitalist economy, private individuals or firms own and control the means of production.
- Economic decisions like what to produce, how to produce, and for whom to produce are made through the market forces of demand and supply.
- There is minimal government intervention.
- Example: USA

(B) Socialist Economy (Government-Controlled)

- In a socialist system, the government owns and controls all major resources and industries.
- The aim is to ensure equal distribution of wealth and eliminate economic inequality.
- Decisions are made centrally by the government for the welfare of society, not profit.
- Example: Former Soviet Union

(C) Mixed Economy (Co-existence of Public and Private Sector)

- A mixed economy combines features of both capitalism and socialism.
- Both the private sector and the government play significant roles in economic activities.
- The government regulates the private sector to prevent exploitation and ensure social welfare.
- Example: India

7. Production Possibility Frontier (PPF)

- It is a curve showing different combinations of production of 2 goods out of given resources and constant technology.
- Also Known As: PPC or Transformation Curve.
- Assumptions:
  - Resources are limited,
  - Fuller utilization of resources,
  - Production technology remains constant,
  - MRT is rising and no resource is equally efficient for the production of both the goods, and
  - Only two goods are produced.
- Features:
  - It is downward sloping from left to right,
  - It is concave to the point of origin

8. PPF Shape Explained

- Concave to Origin:
  - Cause: Resources aren't equally suited for all activities.
  - Effect: Higher opportunity cost with increased production.
- Convex to Origin (rare):
  - Cause: Equal productivity across resources.
  - Effect: Lower opportunity cost.
- Straight Line:
  - Cause: Constant trade-off rate (constant MRT).
  - Effect: Opportunity cost remains constant as production changes.

9. Shifting in Production Possibility Curve

The Production possibility curve will shift under following two condition:

- Change in resources,
- Change in technology of production
  - Rightward shift of PPF shows increase in resources or improvement in technology. Ex- Labour becoming more skilled, improvement in technology, increase in productivity of land.
  - Leftward shift of PPF shows the decrease in resources or degradation of technology in the economy.

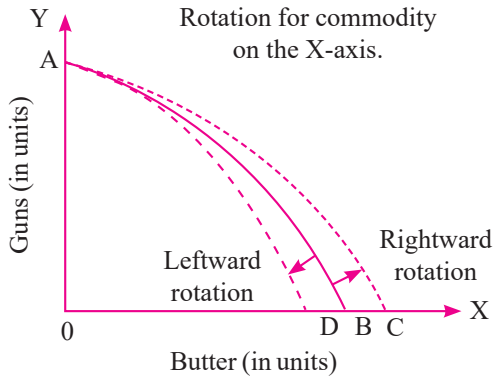
ROTATION OF PPF

It happens when there is change in productive capacity (resources or technology) with respect to only one good. The rotation can be either for the commodity on the X-axis or for commodity on the Y-axis.

1. Rotation for commodity on the X-axis:

Where there is a technology improvement or an increase in resources for production of the commodity on the X-axis (say butter), then PPF will rotate from AB to AC

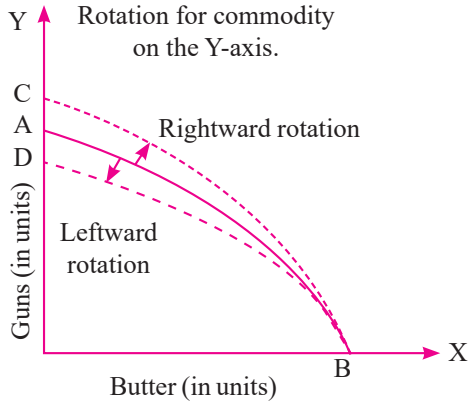
However, in case of technological degradation or decrease in resources for production of butter then PPF will rotate to the left from AB to AD.



2. Rotation for commodity on the Y-axis:

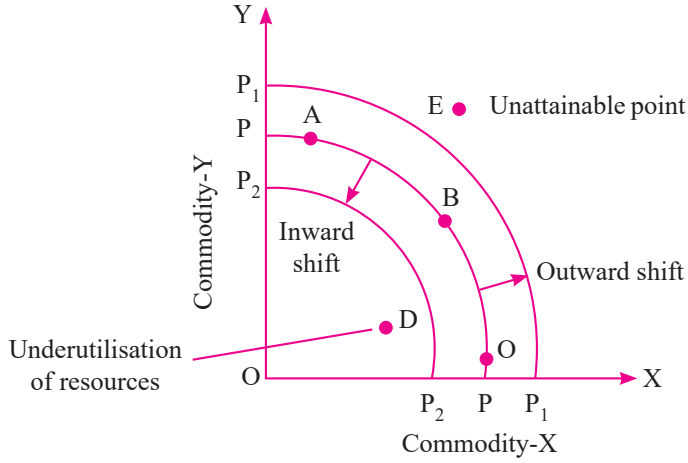
A technological improvement or an increase in resources for production of commodity on Y-axis (say, butter) will rotate the PPF from AB to CB.

However, in case of degradation in technology or a decrease in resources for production of guns, will rotate the PPF to the left from AB to DB as shown in figure.



OVERVIEW OF PPF

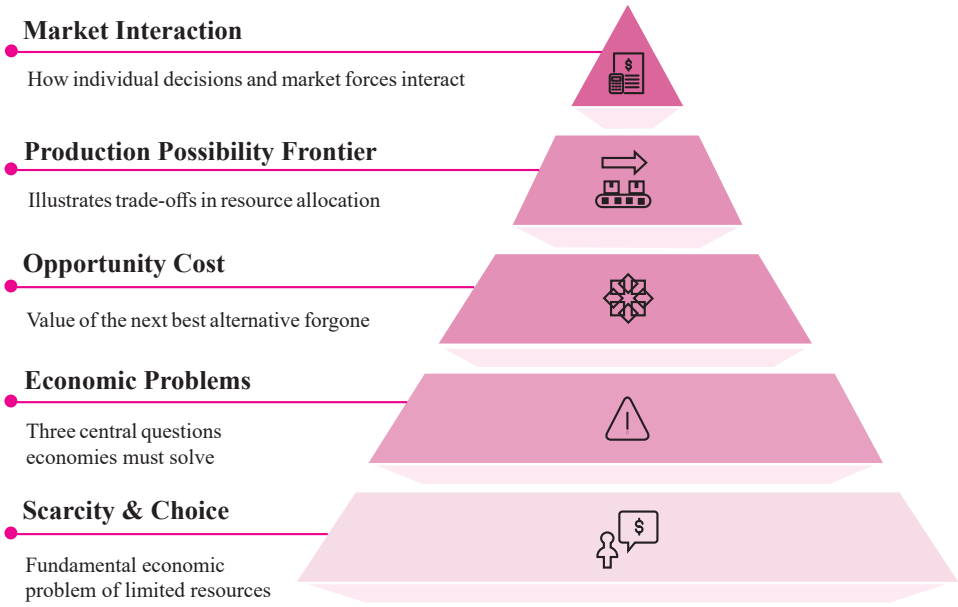
Let us quickly revise the concept of PPF with the help of diagram.



Conclusion

This chapter builds the foundation of economic reasoning, helping students understand how individuals and societies make economic choices in the face of scarcity. It sets the stage for deeper learning in microeconomics by focusing on individual behaviour, choices, and resource allocation.

Economic Decision-Making Hierarchy



Multiple Choice Questions

Instructions: Choose the most appropriate option.

1. Meaning of Microeconomics

1. Which of the following best defines microeconomics?

(*a*) Study of national income
(*b*) Study of economic growth
(*c*) Study of individual units of the economy
(*d*) Study of the general price level

Ans: (*c*) Microeconomics is the study of how individuals and firms make decisions regarding resource allocation, pricing, etc.

2. Microeconomics deals with:

(*a*) Employment level in the economy
(*b*) Inflation trends
(*c*) Price and output decisions of a firm
(*d*) National income

Ans: (*c*) Microeconomics analyses individual producers' or firms' decisions about prices and quantities.

3. Microeconomics is also known as:

(*a*) Aggregate economics
(*b*) National economics
(*c*) Individual economics
(*d*) Global economics

Ans: (*c*) Microeconomics is also called price theory or individual economics because it deals with individual behavior.

4. The study of individual consumer behavior falls under:

(*a*) Macroeconomics
(*b*) Econometrics
(*c*) Microeconomics
(*d*) International economics

Ans: (*c*) Consumer behavior, such as utility, demand, and choices, is a topic studied under microeconomics.

2. Micro vs. Macro Economics

5. Macroeconomics is concerned with:

(*a*) Firm's pricing policy
(*b*) Individual consumer's budget
(*c*) Inflation and unemployment
(*d*) Production decisions of a factory

Ans: (*c*) These are economy-wide issues, and thus part of macroeconomics, not microeconomics.

6. Which of the following is studied under microeconomics?

(*a*) Balance of payments
(*b*) Individual firm's cost
(*c*) Fiscal deficit
(*d*) National output

Ans: (*b*) Microeconomics focuses on the cost structures and decision-making of individual firms.

7. The price determination of a commodity is studied under:

(*a*) Macroeconomics
(*b*) Financial Economics
(*c*) Microeconomics
(*d*) Econometrics

Ans: (*c*) How prices are set for individual goods is the concern of microeconomics.

8. Microeconomics focuses on:

(*a*) Aggregate demand
(*b*) Aggregate supply
(*c*) Individual choices
(*d*) Government budgeting

Ans: (*c*) Microeconomics explains how individual consumers and producers make choices to optimize utility and profit.

3. Central Problems of the Economy

9. Which of the following is not a central problem of an economy?

(*a*) What to produce
(*b*) How to produce
(*c*) For whom to produce
(*d*) When to produce

Ans: (*d*) 'When to produce' is not considered one of the central economic problems.

Assertion-Reason Type MCQs

Directions: *In the questions given below, there are two statements marked as Assertion (A) and Reason (R). Read the statements and choose the correct option:*

(*a*) *Both Assertion* (*A*) *and Reason* (*R*) *are true, and Reason* (*R*) *is the correct explanation of Assertion* (*A*).

(*b*) *Both Assertion* (*A*) *and Reason* (*R*) *are true, but Reason* (*R*) *is not the correct explanation of Assertion* (*A*).

(*c*) *Assertion* (*A*) *is true, but Reason* (*R*) *is false.*

(*d*) *Assertion* (*A*) *is false, but Reason* (*R*) *is true.*

1. **Assertion (A):** Microeconomics studies the behavior of individual consumers and producers.
   Reason (R): Microeconomics focuses on the functioning of the whole economy, including national income and employment.

Ans: (*c*) Microeconomics focuses on individual decision-makers, like households and firms. National income and employment fall under macroeconomics, so the reason is incorrect.

2. **Assertion (A):** Every economy has to make choices regarding the use of its resources.
   Reason (R): Resources are scarce about human wants.

Ans: (*a*) The scarcity of resources compels every economy to choose what, how, and for whom to produce. Hence, the assertion and the reason are both correct, and the reason explains the assertion.

3. **Assertion (A):** A mixed economy allows both public and private sectors to operate.
   Reason (R): In a mixed economy, all economic decisions are made by the private sector only.

Ans: (*c*) A is true, but R is false
Explanation: Mixed economies include both government and private participation. The reason is false because decisions are shared between the public and private sectors.

4. **Assertion (A):** Microeconomic analysis often involves marginal thinking.
   Reason (R): Marginal analysis compares the additional benefit with the extra cost.

Ans: (*a*) Marginal analysis helps decision-makers weigh the benefit of one more unit against its cost. This forms a core part of microeconomic reasoning.

5. **Assertion (A):** Normative economics provides an objective analysis of facts.
   Reason (R): Normative economics is based on personal opinions about what should happen in the economy.
   (*a*) Both A and R are true, and R is the correct explanation of A
   (*b*) Both A and R are true, but R is not the correct explanation of A
   (*c*) A is true, but R is false
   (*d*) A is false, but R is true

Ans: (*d*) Normative economics is not objective. It reflects values and opinions (e.g., "The rich should be taxed more"), not factual analysis.

Two-Statement Based MCQs

Instructions:

Read both statements carefully and choose the correct option:

Statement I *and* ***Statement II***

Choose the correct option:

(*a*) *Both statements are true, and Statement II correctly explains Statement I.*

(*b*) *Both statements are true, but Statement II does not explain Statement I.*

(*c*) *Statement I is true, but Statement II is false.*

(*d*) *Statement I is false, but Statement II is true.*

1. **Statement I:** Microeconomics focuses on individual economic units like households and firms.
   Statement II: Microeconomics studies the economy as a whole, including national income and employment.

Ans: (*c*) Microeconomics deals with individual units. Studying the overall economy is the subject of macroeconomics, so Statement II is incorrect.

2. **Statement I:** Scarcity is the basic reason why every economy faces the problem of choice.
   Statement II: Resources are unlimited, and wants are limited.

Ans: (*b*) Scarcity arises because **resources are limited** and **wants are unlimited**, not the other way around. Hence, only Statement I is correct.

3. **Statement I:** In a centrally planned economy, economic decisions are made by individual consumers and producers.
Statement II: In a mixed economy, both the government and private individuals play a role in economic decision-making.

Ans: (*c*) In centrally planned economies, the **government**, not individuals, takes major economic decisions. In a **mixed economy**, both the government and private sector participate.

4. **Statement I:** 'What to produce' is one of the central economic problems.
Statement II: This problem arises because resources can satisfy all human wants.

Ans: (*b*) The problem of **'what to produce'** arises **because resources are scarce**, and they cannot satisfy all wants. Hence, only Statement I is correct.

5. **Statement I:** Normative economics deals with factual and data-based analysis.
Statement II: Positive economics explains what is, while normative economics explains what ought to be.

Ans: (*c*) **Normative economics** is based on **opinions or value judgments**, not facts. **Positive economics** deals with factual analysis. Thus, Statement II is correct.

Match the Following Questions

1. Match the items in Column I with those in Column II. Choose the correct pair.

Column I	Column II
A. Microeconomics	1. The economy as a whole
B. Positive Economics	2. Decision-making at the macro level
C. Scarcity	3. Unlimited wants and limited resources
D. Central Problem	4. Price level and national income

Ans: Correct Pair: C – 3

2. Match Column I with Column II:

Column I	Column II
A. Macroeconomics	1. Study of one consumer
B. Marginal Opportunity Cost	2. Total cost of all alternatives
C. Positive Economics	3. Study of resource allocation
D. Microeconomics	4. Focuses on inflation and GDP

Ans: Correct Pair: D – 1

3. Match Column I with Column II:

Column I	Column II
A. Free Goods	1. Limited in supply
B. Economic Goods	2. Have no opportunity cost
C. Macroeconomics	3. Concerned with fiscal policy
D. Normative Economics	4. Deals only with facts

Ans: Correct Pair: B – 1

4. Match Column I with Column II:

Column I	Column II
A. Wants	1. Free of cost
B. Economic Problems	2. Result of scarcity
C. Production Possibility	3. Based on value judgement
D. Positive Economics	4. Based on facts

Ans: Correct Pair: B – 2

5. Match Column I with Column II:

Column I	Column II
A. Capitalist Economy	1. The government decides allocation
B. Socialist Economy	2. Based on customs and traditions
C. Mixed Economy	3. Based on market forces
D. Centrally Planned Economy	4. Dual role of market and government

Ans: Correct Pair: C – 4

Exam Based Subjective Questions

EXAM-BASED SUBJECTIVE QUESTIONS (3 MARKS)

1. Define microeconomics. How is it different from macroeconomics?

Ans: Microeconomics is the branch of economics that studies individual economic units such as households, firms, and markets. It focuses on how decisions are made regarding resource allocation, pricing, and consumption at a small scale.

Difference:

Microeconomics analyzes **individual units**, whereas macroeconomics deals with **aggregates** like national income, inflation, and employment.

2. Explain the central problem of 'how to produce.

Ans: The problem of 'how to produce' relates to choosing the technique of production — whether to use **labour-intensive** methods (more labour, less capital) or **capital-intensive** methods (more capital, less labour).

This decision depends on the availability of resources and the goal of minimizing cost and maximizing efficiency.

3. What is a mixed economy? Give two features.

Ans: A mixed economy is an economic system in which both the **government and private sector** play a role in economic decision-making and production activities.

Features:

1. Co-existence of public and private sectors.
2. Economic planning by the government, along with market-based mechanisms.

4. Distinguish between economic and non-economic activities with examples.

Ans: **Economic activities** are those performed to earn income, e.g., a teacher teaching in a school.

Non-economic activities are done for personal satisfaction or social obligation, not for income, e.g., a mother cooking for her family.

5. What is meant by opportunity cost? Explain with an example.

Ans: Opportunity cost refers to the **value of the next best alternative foregone** when a choice is made.

Example: If a student chooses to study instead of watching a movie, the opportunity cost is the enjoyment of the movie that was sacrificed.

EXAM-BASED SUBJECTIVE QUESTIONS (4 MARKS)

1. Explain the subject matter of economics.

Ans: Economics is essentially concerned with how individuals and societies allocate scarce resources. The subject is divided into two broad branches:

- **Microeconomics:** Focuses on individual units such as households and firms. It covers theories like:
  - Consumer behavior
  - Producer decision-making
  - Price determination
- **Macroeconomics:** Deals with the economy as a whole. It covers broader topics like:
  - National income and employment
  - Inflation and deflation
  - Government budget and fiscal policy
  - Foreign trade and balance of payments

Scope of Microeconomics:

Microeconomics deals with various aspects of individual decision-making and the functioning of markets. Its scope can be understood through the following three key areas:

1. **Consumer's Behaviour:** It studies how **consumers allocate their limited income** to different goods and services to **maximize satisfaction**. Concepts such as utility, demand, and consumer equilibrium fall under this.

   Example: Understanding why the demand for smartphones increases when their prices fall.

2. **Producer's Behaviour and Production Decisions:** Microeconomics examines how a **firm decides what and how much to produce**, and how it uses resources to **minimize cost and maximize profit**. It covers concepts like production function, cost, revenue, and the producer's equilibrium.

   Example: A bakery deciding how many cakes to produce based on ingredient costs and expected sales.

3. **Price Determination through Markets:** Microeconomics explains **how prices of goods and services are determined** through the interaction of **demand and supply** in a market. It also studies how prices allocate resources efficiently.

   Example: The rise in vegetable prices due to a sudden drop in supply caused by floods.

Conclusion:

Microeconomics plays a crucial role in understanding **individual economic behavior**, the **functioning of markets**, and helps in **efficient resource allocation**. Businesses, policymakers, and consumers need to make informed economic decisions.

CASE STUDY-BASED QUESTIONS

Read the passage and answer the following questions:

A small village named Rampur has limited land and labor. The villagers can either grow wheat or vegetables using their available resources. Initially, most land is used for growing wheat because it has a higher demand in the market. However, over time, the demand for vegetables rises due to nearby urban areas, and the prices of vegetables go up.

The village panchayat decides to allocate more land to vegetable farming. Some farmers shift their resources from wheat to vegetables. But not all land is equally suitable for growing vegetables, so the output per unit starts decreasing. Some farmers also face challenges in choosing whether to use traditional labor-intensive methods or modern machines for cultivation.

1. Identify the central economic problem being faced by the farmers in Rampur. **(1 marks)**

Ans: The central economic problem is "What to produce" – choosing between growing wheat or vegetables.

2. Which concept explains the villagers' decision to shift resources from wheat to vegetables? **(1 marks)**

Ans: The concept of **opportunity cost** explains this shift — the farmers gave up wheat production to benefit from the higher price of vegetables.

3. Which economic question is being addressed when farmers choose between manual labour and machines? **(2 marks)**

Ans: The question being addressed is **"How to produce"** – choosing the technique of production (labour-intensive vs capital-intensive methods).

4. Explain why the output of vegetables started decreasing when more land was shifted to their cultivation. **(2 marks)**

Ans: This is due to the **Law of Increasing Opportunity Cost**. As more land (less suitable for vegetables) is used, it becomes less efficient, and the marginal productivity declines, reducing overall output per additional unit of input.

WORD OF ADVICE

"Master the basics here — they're the foundation of all future economic understanding. Focus on key terms like scarcity, choice, opportunity cost, and central problems. Don't just memorize — try to relate them to real-life situations (like choosing between study time and leisure). A strong grip on this chapter will make Microeconomics logical and easy throughout the year!"

Tips:

- Understand **why scarcity leads to choice** and, hence, economic problems.
- Learn the **3 central problems** of an economy deeply — they're frequently asked in exams.
- Get comfortable with terms like **MRT (Marginal Rate of Transformation)**, **opportunity cost**, and **PPF (Production Possibility Frontier)**.
- Practice small **numerical examples** related to PPF and trade-offs.

SAMPLE QUESTION PAPER

TIME: 3 HRS **MAXIMUM MARKS: 80**

GENERAL INSTRUCTIONS

1. *This question paper contains two sections:*
   ***Section A** – Micro Economics*
   ***Section B** – Statistics*
2. *This paper contains 20 Multiple Choice Questions type questions of 1 mark each.*
3. *This paper contains 4 Short Answer Questions type questions of 3 marks each to be answered in 60 to 80 words.*
4. *This paper contains 6 Short Answer Questions type questions of 4 marks each to be answered in 80 to 100 words.*
5. *This paper contains 4 Long Answer Questions type questions of 6 marks each to be answered in 100 to 150 words.*

Section A – Micro Economics

1. **Assertion (A):** 100, 95, 48, 86, 35, 65, 90, 54, 65, 98 are the scores of a class of 10 students in Statistics. This is an example of statistical data.
Reason (R): The statistical data are expressed in numbers and have to have some homogeneity. **[1]**

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

2. Paasche index is based on **[1]**

(*a*) Average of current and base year
(*b*) Current year quantities.
(*c*) Base year quantities
(*d*) Base year Prices

3. If the relationship between x and y is positive, as variable y decreases, variable x **[1]**

(*a*) Increases
(*b*) Remains same
(*c*) Changes linearly
(*d*) Decreases

4. Calculate index numbers from the following data by simple aggregate method taking prices of 2000 as base. **[1]**

Commodity		A	B	C	D
Price per unit (in Rupees)	2000	80	50	90	30
	2001	95	60	100	45

(*a*) 120
(*b*) 150
(*c*) 130
(*d*) 140

5. If with the rise of 10% in prices the wages are increased by 20%, the real wage increase **[1]**

(*a*) 2
(*b*) 30
(*c*) 10
(*d*) 20

6. Index Number reveals the state of **[1]**

(*a*) None
(*b*) Inflation
(*c*) Deflation
(*d*) Both

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STATISTICS FOR ECONOMICS

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Chapter

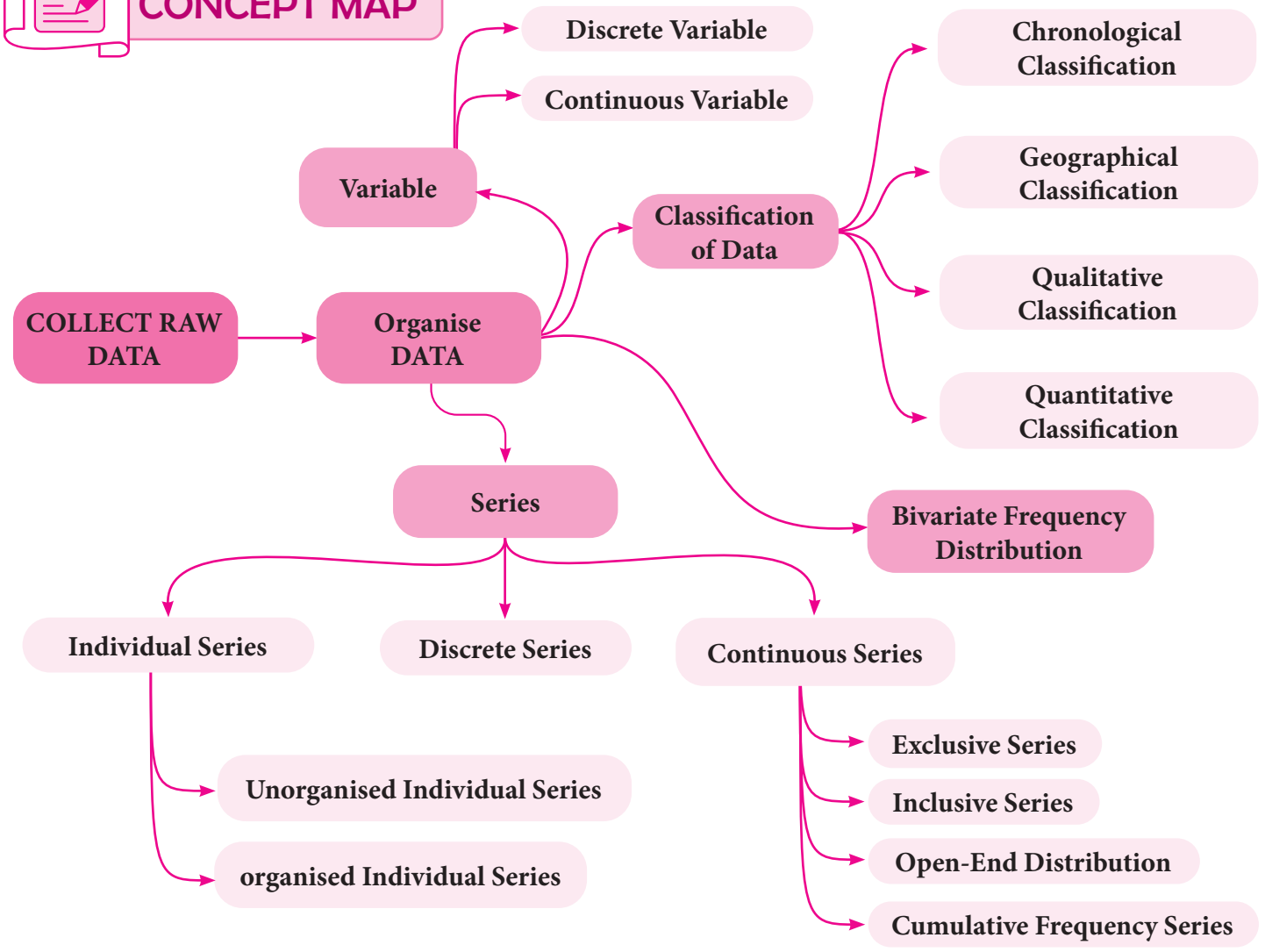
3

ORGANISATION OF DATA

LEARNING OBJECTIVES

- *Understand what organisation of data means.*
- *Know how frequency distribution helps classify data.*
- *Learn the difference between continuous and discrete variables.*
- *Identify the types of classification: time, location, quality, and quantity.*
- *Understand the steps to prepare a frequency distribution*

CONCEPT MAP



1. Introduction

When we collect information (called data), it is usually in a raw and scattered form. To make sense of it, we organise it using tables, charts, arrays, or classifications.

Example: If you collect the test marks of 50 students, listing them randomly is confusing. However, arranging them from highest to lowest or grouping them into ranges (such as 0–10, 11–20, etc.) makes it easier to determine who scored the most or how many passed.

1.1 Classification of Data

Refers to the method of organising data based on shared traits or features.

Purpose of Classification:

- To present complex data in a simpler and more understandable format
- To enable effective comparisons
- To assist in smooth analysis and interpretation
- To identify and understand cause-and-effect connections

1.2 Types of Classification

(*a*) **Chronological Classification/ Temporal Classification (Time-Based):** Data is grouped according to **time, such as year, month, etc.** (Use: Helps study trends or patterns over a specific time period).

Example: Rainfall during the last few years

Year	Rainfall (in mm)
2020	800
2021	950
2022	600
2023	910

(*b*) **Geographical Classification/Spatial Classification (Location-Based):** Data is grouped by **region or place**. (Use: Useful for comparing areas or regions).

Example: Literacy rate in different states of India

State	Literacy Rate (%)
Kerala	96
Bihar	70
Maharashtra	85
Rajasthan	68

(*c*) **Qualitative Classification (Attribute-Based):** Data is grouped based on **non-numeric qualities or characteristics.** (Use: Helps in analyzing social categories like gender, education level, etc.)

Example: Number of students in Class 11

Gender	No. of Students
Male	55
Female	45

(*d*) **Quantitative Classification (Variable-Based):**Data is grouped according to **numerical values**. (Use: Useful for statistical analysis like frequency distribution, mean, graphs, etc.)

Income Range	No. of Families
0-10,000	12
11,000-20,000	25
21,000-30,000	30
31,000-40,000	18

2. Variable

A **variable** is a measurable quantity that can vary or change from one observation to another.

Example: Price is considered a variable since different goods have different prices.

Variables are generally classified into two types:

2.1 Discrete Variable

A variable is termed **discrete** when it takes only specific, distinct whole-number values.

Example: Number of students in a class (can be 30, 31—not 30.5).

2.2 Continuous Variable

A variable is called **continuous** when it can assume any value within a specified range. These values are not restricted to whole numbers and may include fractions or decimals.

Example: Height, weight, temperature, etc.

3. Series

3.1 Individual Series

An **individual series** is a form of data presentation in which each observation is recorded separately. Every item is shown with its distinct value.

There are two types of individual series:

(*a*) Unorganized Individual Series: This involves raw, unarranged data presented in an unordered format.

Example: Marks scored by 10 students in economics—21, 30, 42, 35, 45, 19, 28, 36, 44, and 27.

(*b*) Organized Individual Series: Here, the data is arranged systematically or sequentially, such as in ascending/descending order or according to roll numbers.

Example: Marks of 25 students listed in order based on their serial numbers.

3.2 Discrete Series (Ungrouped Frequency Distribution)

A **discrete series** displays individual data values along with their respective frequencies. Each item in the dataset occurs in a countable manner and is not grouped into intervals.

In such a series, every distinct value is listed, and the number of times it appears (its frequency) is recorded.

Example: Marks obtained (out of 25) by 25 students in economics:

Raw Data:

16, 13, 15, 14, 14, 17, 16, 15, 17, 16, 15, 16, 17, 14, 17, 15, 16, 13, 16, 17, 17, 14, 16, 15, 16

Now let's organize this into a discrete series:

Marks	Frequency
13	2
14	4
15	5
16	8
17	6
Total	**25**

3.3 Continuous Series (Grouped Frequency Distribution)

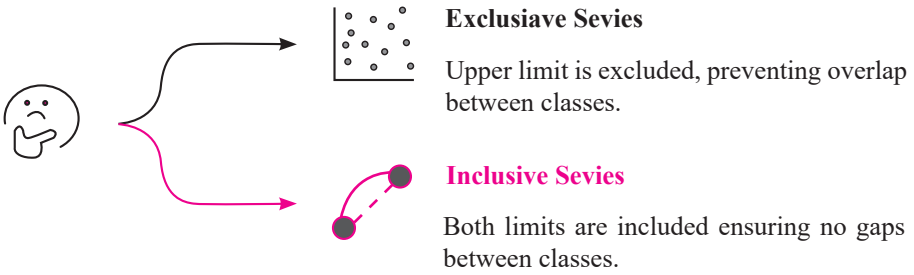
A **continuous series** is a type of statistical series where the data is grouped into class intervals, representing continuous variables. Instead of listing individual values, this series displays a range for each group, making it suitable for large datasets with closely spaced values.

Example: Marks of Students (out of 50)

Marks Obtained	Number of Students
0-10	2
10-20	4
20-30	9
30-40	4
40-50	7

(Class interval, or class width, is the difference between the upper and lower class limits.)

Types of continuous series:



(*a*) Exclusive Series: In an **exclusive series**, the upper limit of a class is not included in that class. The next class starts from the same number as the upper limit of the previous class.

Format Example: 0–10, 10–20, 20–30, 30–40

Note: A value of 20 will be included in the 20–30 class, not 10–20.

(*b*) Inclusive Series: In an **inclusive series**, both the lower and upper limits are included in the class. There is no overlap or gap between the class intervals.

Format Example: 1–10, 11–20, 21–30, 31–40

Note: A value of 20 belongs to the 11–20 class, not the next one.

(*c*) Open-End Distribution

In this series, either the first class has no lower limit or the last class has no upper limit, or both. This is used when extreme values are uncertain or unlimited.

- **Example:** Below 10, 10–20, 20–30, 30–40, Above 40
- Useful in age, income, or population data where limits can be indefinite.

(*d*) Cumulative Frequency Series

This series shows the total number of observations up to a certain class limit. It helps in understanding the running total of frequencies.

- **Two types:**
  - Less than Series: Shows total frequency less than the upper limit.
    Example: Less than 10, Less than 20, Less than 30
  - More than Series: Shows total frequency more than the lower limit.
    Example: More than 0, More than 10, More than 20

4. Univariate and Bivariate Frequency Distribution

Univariate Frequency Distribution

- When data is grouped or classified based on **only one variable**, it is called univariate.
- It is also known as a one-way frequency distribution.
- **Examples:** Height of students, Marks in Maths

Bivariate Frequency Distribution

- When data is grouped based on **two variables together**, it is called bivariate.
- It is also called a two-way frequency distribution.
- **Examples:** Height and weight of students, marks in economics, and Marks in Business Studies

Multiple Choice Questions

Instructions: Choose the most appropriate option.

1. Meaning & Purpose of Organising Data

1. What is the main purpose of organising raw data?

(*a*) To permanently delete unimportant data
(*b*) To make data readable for computers only
(*c*) To simplify and make the data easier to interpret
(*d*) To remove extreme values

Ans: (*c*) Organising data helps present it in a clear format so that we can easily read, compare, and interpret it.

2. Which of the following tools helps in arranging unorganised data?

(*a*) Stories and poems
(*b*) Tables and arrays
(*c*) Newspaper articles
(*d*) Flashcards

Ans: (*b*) Tables and arrays are the most commonly used tools for arranging raw data meaningfully.

2. Classification of Data

3. In which of the following is data arranged over time (like by year or month)?

(*a*) Geographical classification
(*b*) Mathematical classification
(*c*) Qualitative classification
(*d*) Chronological classification

Ans: (*d*) Chronological classification sorts data by time (like years or months), useful for studying trends.

4. If we group data by states or cities, it is called:

(*a*) Quantitative classification
(*b*) Chronological classification
(*c*) Geographical classification
(*d*) Regional coding

Ans: (*c*) Geographical classification groups data based on regions, such as comparing states or cities.

5. Grouping students as "boys" and "girls" is an example of:

(*a*) Qualitative classification
(*b*) Quantitative classification
(*c*) Geographical classification
(*d*) Chronological classification

Ans: (*a*) Qualitative classification is based on non-numeric features like gender, caste, or education level.

6. In quantitative classification, data is grouped according to:

(*a*) Colours
(*b*) Time
(*c*) Qualities
(*d*) Numerical values

Ans: (*d*) Quantitative classification deals with numbers like income, marks, etc., and is useful for analysis.

3. Variables

7. Which of the following is a discrete variable?

(*a*) Weight of fruits
(*b*) Marks in a class test
(*c*) Number of students in a room
(*d*) Temperature during the day

Ans: (*c*) Discrete variables take only whole values—like number of people, not 3.5 people.

8. A continuous variable can:

(*a*) Only takes values in whole numbers
(*b*) Vary in fractions or decimals across a range
(*c*) Be used only in pie charts
(*d*) Never change in value

Ans: (*b*) Continuous variables include values with decimals or fractions, like weight or height.

4. Types of Series

9. Which type of series shows each item individually, either arranged or unarranged?

(*a*) Continuous series
(*b*) Individual series
(*c*) Frequency series
(*d*) Discrete series

Ans: (*b*) An individual series lists every observation one by one, either in raw or arranged form.

10. The major difference between discrete and continuous series is

(*a*) Discrete series uses class intervals.

(*b*) Continuous series uses individual values.

(*c*) Discrete uses whole values; continuous uses grouped intervals.

(*d*) Both show data in alphabetical order

Ans: (*c*) Discrete series shows specific values with their frequency, while continuous series uses value ranges.

5. Types of Continuous Series

11. In an exclusive series, which class boundary is not included in that class?

(*a*) Upper limit (*b*) Lower limit

(*c*) Both limits (*d*) Frequency

Ans: (*a*) In an exclusive series, the upper limit is excluded from that class and counted in the next.

12. Which of these class formats shows an inclusive series?

(*a*) 0–10, 10–20, 20–30 (*b*) Below 10, 10–20, 20–30

(*c*) 1–10, 11–20, 21–30 (*d*) 10–19, 20–29

Ans: (*c*) An inclusive series includes both limits, e.g., 1–10 includes both 1 and 10 in that class.

13. In which type of series is the first or last class open-ended?

(*a*) Inclusive series (*b*) Chronological series

(*c*) Open-end series (*d*) Discrete series

Ans: (*c*) Open-end series has classes like "Below 10" or "Above 40," where no limit is fixed on one end.

14. A cumulative frequency series helps in:

(*a*) Measuring the speed of data (*b*) Showing the total of frequencies up to a certain limit

(*c*) Collecting random facts (*d*) Drawing bar diagrams only

Ans: (*b*) Cumulative frequency adds up frequencies as we move forward; useful for medians and graphs.

15. "Less than 10," "less than 20," etc., represent which type of frequency series?

(*a*) Less than a series (*b*) Equal class series

(*c*) More than a series (*d*) Exclusive series

Ans: (*a*) The "less than" series shows the total frequency for all values **less than** a particular class limit.

Assertion-Reason Type MCQs

Directions: *In the questions given below, there are two statements marked as Assertion (A) and Reason (R). Read the statements and choose the correct option:*

(*a*) *Both Assertion* (*A*) *and Reason* (*R*) *are true, and Reason* (*R*) *is the correct explanation of Assertion* (*A*).

(*b*) *Both Assertion* (*A*) *and Reason* (*R*) *are true, but Reason* (*R*) *is not the correct explanation of Assertion* (*A*).

(*c*) *Assertion* (*A*) *is true, but Reason* (*R*) *is false.*

(*d*) *Assertion* (*A*) *is false, but Reason* (*R*) *is true.*

1. **Assertion (A):** In a continuous series, data is grouped into class intervals.

Reason (R): Continuous variables can take any value, including decimals or fractions.

Ans: (*a*) In a continuous series, we deal with data like height, weight, income, etc., that can have fractional values. Since it's difficult to list each value individually, we use class intervals to group data (e.g., 0–10, 10–20). The reason is also correct because continuous variables can take any value in a given range, including decimals (like 5.5 kg, 162.3 cm).

So both statements are true, and the reason logically explains why we use class intervals in continuous series.

2. **Assertion (A):** Chronological classification is used to study the literacy rate in different states.

Reason (R): Chronological classification is based on time, such as years or months.

Ans: (*c*) The reason is correct—chronological classification arranges data based on time (e.g., year-wise population growth). However, the assertion is incorrect—the literacy rate in different states refers to regions, not time. This would fall under geographical classification, not chronological. Thus, only R is true; A is false.

3. **Assertion (A):** In an exclusive series, the upper-class limit is included in that class interval.
   Reason (R): Exclusive series helps avoid overlap between class intervals.

Ans: (*c*) In an exclusive series, the upper limit is excluded from the class it appears in and included in the next. For example, in 10–20, the value 20 goes to the next class (20–30). Hence, the assertion is false. However, the reason is correct because this method ensures that there is no overlapping between classes—each value fits into only one class. Therefore, only R is true.

4. **Assertion (A):** Tables and arrays are used to present raw data in an organised form.
   Reason (R): Unorganised data is difficult to interpret and compare.

Ans: (*a*) Raw data, such as test scores from 100 students, is hard to understand if not arranged properly. Tables and arrays help organise such data into meaningful forms (ascending, descending, groups, etc.). Unorganised data makes it hard to draw conclusions or compare. Therefore, the reason correctly explains why we use tables or arrays. Thus, both A and R are true, and R explains A.

5. **Assertion (A):** Qualitative classification is used when data is based on attributes like gender or religion.
   Reason (R): These attributes can be expressed in numerical values.

Ans: (*c*) The assertion is correct—qualitative classification is based on non-numeric features like gender, caste, education level, etc. The reason is false—these features cannot truly be expressed as numerical values (e.g., "male = 1, female = 2" is a coding method, not true quantification). So, the assertion is true, but the reason is incorrect.

6. **Assertion (A):** Discrete variables can take only whole-number values.
   Reason (R): The number of students in a class is an example of a continuous variable.

Ans: (*c*) The assertion is true—discrete variables are countable and take only whole numbers (e.g., 2, 5, 10). But the reason is false—the number of students is a classic example of a discrete variable, not continuous (you can't have 30.5 students). Thus, A is true, and R is false.

Two Statements Based Questions

Instructions:

Read both statements carefully and choose the correct option:

Statement I *and* ***Statement II***

Choose the correct option:

(*a*) *Both statements are true, and Statement II correctly explains Statement I.*

(*b*) *Both statements are true, but Statement II does not explain Statement I.*

(*c*) *Statement I is true, but Statement II is false.*

(*d*) *Statement I is false, but Statement II is true.*

1. **Statement I:** A continuous variable can take only fixed whole-number values.
   Statement II: Height and weight are examples of continuous variables.

Ans: (*d*) Statement I is false because a continuous variable can take any value, including decimals and fractions (e.g., 5.3 kg, 162.5 cm). Statement II is true—height, weight, and temperature are typical examples of continuous variables, as they can take non-whole values.

2. **Statement I:** In a discrete series, data is grouped into class intervals.
   Statement II: A discrete series shows specific values with their frequencies.

Ans: (*d*) Statement I is false because class intervals are used in continuous series, not in discrete series. Statement II is true—in a discrete series, each unique value (e.g., marks like 13, 14, and 15) is shown along with how many times it occurs (frequency).

3. **Statement I:** Qualitative classification groups data based on non-numerical characteristics.
   Statement II: Classifying people by income level is an example of qualitative classification.

Ans: (*c*) Statement I is true—qualitative classification is based on attributes like gender, religion, or education level, not numbers. Statement II is false—income is quantitative data because it involves numbers. Grouping people by income is a quantitative classification, not qualitative.

4. **Statement I:** In exclusive classification, the upper limit of a class is included in that class.
   Statement II: The class intervals in an exclusive series do not overlap.

Ans: (*d*) Statement I is false—in an exclusive series, the upper limit is not included in the class. For example, in 10–20, value 20 goes to the next class. Statement II is true—since the upper limit is excluded, there is no overlap, and each data value fits into only one class interval.

5. **Statement I:** Individual series show each observation separately, often in raw form.
Statement II: Organising individual data is not useful for further statistical analysis.

Ans: (*c*) Statement I is true—individual series lists each data point separately, either in raw, ascending, or descending order. Statement II is false—even though individual series are simple, organising them helps in calculating averages, medians, and other statistical tools, so they are very useful in further analysis.

Match the Following Questions

1. Match Column A with Column B:

Column A (Type of Classification)	Column B (Example)
a. Chronological Classification	i. Literacy rate by state
b. Geographical Classification	ii. Marks of students in a test
c. Qualitative Classification	iii. Gender-wise division
d. Quantitative Classification	iv. Data arranged by year

Ans: a → iv, b → i, c → iii, d → ii
Chronological → time-based; geographical → state-wise; qualitative → based on traits like gender; quantitative → numerical like marks.

2. Match Column A with Column B:

Column A (Term)	Column B (Definition/Example)
a. Discrete Variable	i. Weight of a person
b. Continuous Variable	ii. Number of cars in the parking
c. Inclusive Series	iii. Class: 1–10, 11–20
d. Exclusive Series	iv. Class: 0–10, 10–20

Ans: a → ii, b → i, c → iii, d → iv
Discrete → whole countable values; Continuous → fractional values possible; Inclusive → both limits included; Exclusive → upper limit excluded.

3. Match Column A with Column B:

Column A (Concept)	Column B (Use/Feature)
a. Individual Series	i. Running total of frequencies
b. Cumulative Frequency Series	ii. Raw/unarranged data shown
c. Open-End Class	iii. No lower or upper limit
d. Frequency Distribution	iv. Organised data in intervals

Ans: a → ii, b → i, c → iii, d → iv
Individual → raw data one by one; Cumulative → total up to a point; Open-end → indefinite limits; Frequency distribution → grouped values.

4. Match Column A with Column B:

Column A (Tool/Term)	Column B (Function)
a. Table	i. Numerical grouping
b. Array	ii. Raw data in order
c. Classification	iii. Grouping by similarity
d. Series	iv. Data in column format

Ans: a → iv, b → ii, c → iii, d → i
Tables show data neatly; arrays arrange it in order; classification groups it meaningfully; series refer to organised numerical data.

5. Match Column A with Column B:

Column A (Series Type)	Column B (Key Feature)
a. Discrete Series	i. Grouped into intervals
b. Continuous Series	ii. Data are shown with frequency
c. Individual Series	iii. Each value is listed separately
d. Cumulative Series	iv. Total frequency is shown stepwise

Ans: a → ii, b → i, c → iii, d → iv

Discrete → exact values + frequency; Continuous → grouped data; Individual → one-by-one listing; Cumulative → adds up frequency till each step.

Exam Based Subjective Questions

EXAM-BASED SUBJECTIVE QUESTIONS (1 MARK)

1. What is meant by the classification of data?

Ans: It helps in arranging large raw data into smaller, meaningful parts so we can easily understand and compare them.

2. Give one example of a discrete variable.

Ans: Discrete variables take whole-number values only (like 1, 2, 3…) and not fractions. You can't have 2.5 children.

3. What type of classification is used when data is arranged over years?

Ans: This type of classification is **time-based** and is used to study changes over time, like rainfall from 2020 to 2023.

4. Name the series where every item is shown separately.

Ans: In an individual series, each observation (like a student's mark) is recorded one by one, not grouped.

5. In which type of series is the upper limit **not included** in the class?

Ans: In an exclusive series, the upper limit goes to the next class to avoid overlapping. For example, 10–20 does **not** include 20.

6. What is meant by cumulative frequency?

Ans: It helps show running totals, useful in making ogives or finding medians in grouped data.

7. Which type of classification is based on place or area?

Ans: It groups data by location, like literacy rates in different states or sales in various cities.

SUBJECTIVE QUESTIONS (4 MARKS)

1. What do you mean by the organisation of data?

Ans: Organisation of data means arranging the raw or unprocessed data systematically and logically so that it becomes easier to interpret and analyze. Raw data, when collected, is often scattered and lacks structure. Organising helps in presenting data in tables, series, or graphs, making comparison and statistical analysis more efficient and meaningful.

2. Why is the organisation of data necessary in statistics?

Ans: The organisation of data is essential to:

1. Simplify complex information
2. Identify trends and patterns
3. Facilitate comparisons and interpretations.

Without organising data, it remains confusing and non-informative, which makes decision-making difficult. Systematically presented data helps in better communication of findings.

3. What are the different ways in which data can be organised?

Ans: Data can be organised in the following forms:

1. **Individual Series:** Each observation is listed separately
2. **Discrete Series:** Data values with respective frequencies
3. **Continuous Series:** Data in class intervals with frequencies

These formats help in presenting qualitative and quantitative information depending on the type of variable involved.

Case Study Based Questions

Case Study 1: Survey on Students' Screen Time (6 Marks)

Read the passage and answer the following questions:

A school surveyed 100 students of Class 11 to study their daily screen time. The raw data collected showed varied responses like 2 hours, 5 hours, 3.5 hours, 6 hours, etc. To make the data meaningful, the teacher grouped the data into class intervals such as 0–2 hours, 2–4 hours, 4–6 hours, and so on. The number of students falling in each interval was also recorded.

1. What method of data organisation is being used here? **(2 Marks)**

Ans: The method of data organisation used here is quantitative classification using frequency distribution. The teacher has grouped continuous numerical data (screen time) into class intervals and counted the number of students in each group, which is a typical method of organising data for easy analysis.

2. Explain the importance of class intervals in organising such data. **(2 Marks)**

Ans: Class intervals are important because they help group a large set of individual data points into defined ranges. In this case, instead of studying all 100 responses separately, the data is grouped into ranges like 0–2 hours, 2–4 hours, etc., making it easier to interpret trends. Class intervals reduce complexity, remove duplication, and give a clearer picture of the distribution pattern.

3. Why is the organisation of this data necessary for further analysis? **(2 Marks)**

Ans: Organising data is necessary to make it understandable and useful. Raw data, such as individual screen times, can be confusing and time-consuming to study. Once organized, we can easily find out which screen time category has the most students, compare usage across groups, and draw conclusions. It also helps in applying statistical tools, such as calculating the mean or preparing graphs.

Case Study 2: Income Distribution in a Village

Read the passage and answer the following questions: (6 Marks)

A researcher visited a village to study the income pattern of its residents. He collected primary data from 80 households. The income levels ranged from ₹2,000 to ₹45,000. To simplify analysis, he grouped the data into class intervals such as ₹0–10,000, ₹10,001–20,000, ₹20,001–30,000, and so on, and noted the number of households in each income group.

1. What type of classification is applied here? **(2 Marks)**

Ans: The classification applied here is a quantitative classification. The data is grouped based on measurable income levels into class intervals, which allows for easier comparison and analysis of numerical data across different income brackets.

2. State the benefit of converting raw income data into grouped data. **(2 Marks)**

Ans: Grouping raw data makes it simpler to analyze large and diverse information. In this case, individual income values are numerous and scattered. Grouping them into ranges helps in identifying patterns, such as which income range is most common and whether income is evenly distributed. It simplifies complex data and improves clarity.

3. How can tabulation further help the researcher after classification? **(2 Marks)**

Ans: After classification, **tabulation** helps present the grouped data in a neat, structured form using rows and columns. For example, income intervals can be listed in rows with the number of households in adjacent columns. This makes it easier to compare data, spot trends, and perform statistical calculations like mean or median. It also enhances readability and improves visual presentation for reports or charts.

Unsolved Numerical Questions

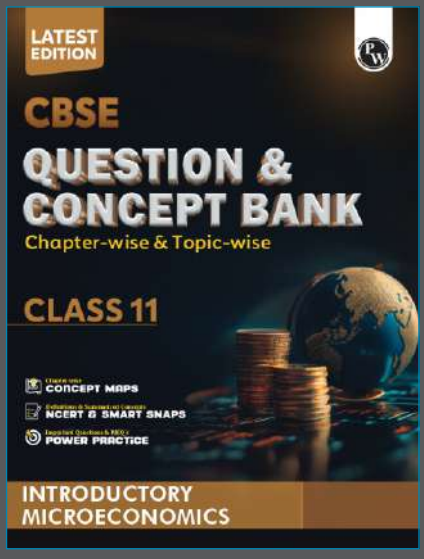
1. Convert the following 'more than' cumulative frequency distribution into a 'less than' cumulative frequency distribution

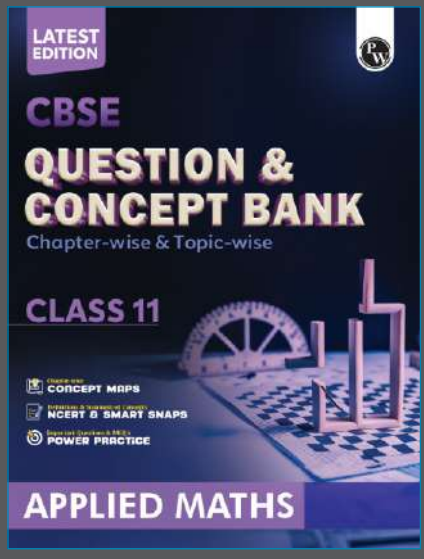
Class-Interval (More than)	10	20	30	40	50	60	70	80
Frequency	124	119	107	84	55	31	12	2

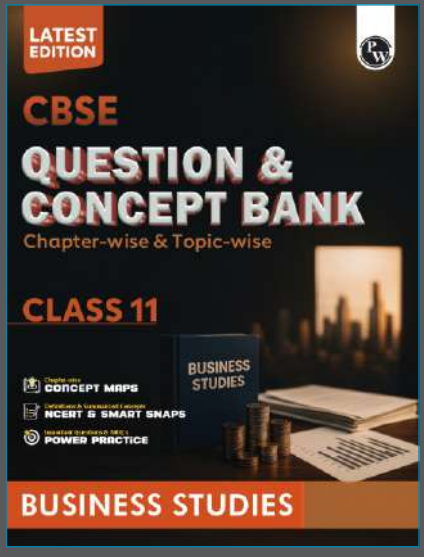
2. Students of the class obtained the following marks in mathematics. Convert the data of the inclusive series into the exclusive series.

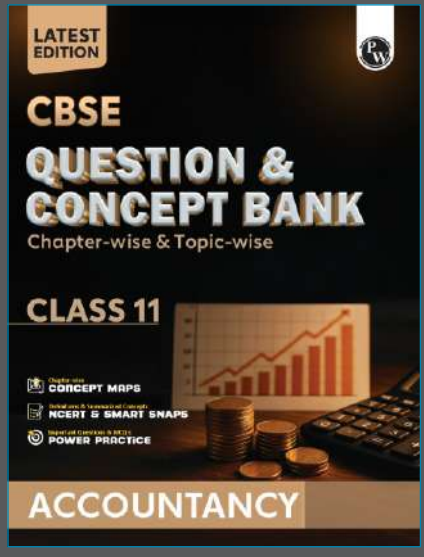
Marks	5-9	10-14	15-19	20-24	25-29
Frequency	3	5	10	4	2

Other books in this series









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