

# NCERT Introductory Macroeconomics

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# NCERT INTRODUCTORY MACROECONOMICS

Class XII — Complete Exercise Solutions

*With Detailed Explanations for Students*



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# Chapter 1: Introduction — Exercise Solutions

This chapter introduces the distinction between macroeconomics and microeconomics, the features of a capitalist economy, and the sectors of an economy.

**Q1.** What is the difference between microeconomics and macroeconomics?

 **Note:** Think of it this way: Micro = individual trees; Macro = the whole forest.

**Answer:**

Microeconomics studies the economic behaviour of individual units such as a single consumer, a single firm, or a single market. It focuses on questions like: How does a consumer decide what to buy? How does a firm set its prices?

Macroeconomics, on the other hand, studies the economy as a whole. It deals with aggregate (total) variables — the total output of a country, the overall price level, the total employment level, etc. It asks questions like: Why does a country experience inflation? What causes unemployment to rise?

| Basis           | Microeconomics                            | Macroeconomics                                 |
|-----------------|-------------------------------------------|------------------------------------------------|
| Scope           | Individual consumer, firm or market       | Entire economy — all markets together          |
| Variables       | Price of a good, output of a firm, profit | GDP, price level, unemployment rate, inflation |
| Decision Makers | Individual consumers and firms (private)  | Government, RBI, SEBI (public institutions)    |

**Q2.** What are the important features of a capitalist economy?

 **Note:** A capitalist economy is based on private ownership and market-driven decisions. India has a mixed economy — partly capitalist, partly state-controlled.

**Answer:**

A capitalist economy has the following key features:

- **Private Ownership of Means of Production:** Land, machinery, factories and other capital goods are owned by private individuals or companies, not the government.
- **Production for the Market:** Goods and services are produced with the aim of selling them in the market and earning profit — not for personal use.
- **Wage Labour:** Firms hire workers from the labour market and pay them wages. Workers do not own the means of production; they sell their labour services.
- **Profit Motive:** Entrepreneurs are driven by the desire to maximise profit. They bear the risks of business and receive profits as a reward.
- **Capital Accumulation:** Profits are often reinvested to expand productive capacity — buying new machinery, building new factories. This is called investment expenditure.

The four factors of production in a capitalist economy are: Land (rewarded by Rent), Labour (rewarded by Wages), Capital (rewarded by Interest), and Entrepreneurship (rewarded by Profit).

**Q3.** Describe the four major sectors in an economy according to the macroeconomic point of view.

 **Note:** *These four sectors explain how money and goods flow through the entire economy.*

**Answer:**

Macroeconomics divides the economy into four interlinked sectors:

1. **Household Sector:** Households consist of individuals or groups of individuals who make consumption decisions jointly. They earn income by supplying factors of production (labour, land, capital) to firms. With this income, they consume goods and services, pay taxes, and save. Their savings flow into financial markets.
2. **Firms (Business Sector):** Firms are production units that hire factors of production from households, organise production and sell the output in the market. The objective is profit maximisation. Profits are used for investment in new capital.
3. **Government:** The government plays a crucial role by levying taxes, making expenditures on public goods (roads, defence, education, health), and using fiscal policy to stabilise the economy. The government collects revenue and spends it on public services, sometimes running a budget deficit or surplus.
4. **External Sector (Rest of the World):** Countries trade with each other. Exports are goods and services sold to foreign countries; imports are goods and services purchased from foreign countries. Capital can also flow in or out — foreign investment coming in, or domestic investment going abroad. The external sector connects the domestic economy to global markets.

 **Note:** *Think of these four sectors as players in a football team — each has a role, and the economy works best when they all coordinate.*

#### Q4. Describe the Great Depression of 1929.

 **Note:** *This is one of the most important events in economic history. It directly led to the birth of macroeconomics!*

**Answer:**

The Great Depression of 1929 was the most severe economic crisis in modern history, affecting virtually every developed country in the world.

Key Facts about the Great Depression:

- The stock market in the United States crashed in October 1929, triggering a chain reaction of economic collapse.
- In the USA, from 1929 to 1933, the unemployment rate rose dramatically from 3% to 25% — meaning 1 in 4 workers had no job.
- Aggregate output (GDP) in the USA fell by about 33% (one-third) during this period.
- Banks failed, businesses closed, and demand for goods fell sharply. Factories sat idle.
- The depression spread to Europe and other parts of the world, causing global economic misery.

Why was it significant for economics?

Classical economists of the time believed that markets would automatically correct themselves and full employment would be restored. But the Depression lasted years, not months, proving the classical view inadequate.

This prompted the British economist John Maynard Keynes to write his landmark book 'The General Theory of Employment, Interest and Money' (1936). Keynes argued that governments needed to actively intervene in the economy to boost demand and reduce unemployment. This gave birth to modern macroeconomics.

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## Chapter 2: National Income Accounting — Exercise Solutions

This chapter covers the fundamental concepts of national income, methods of calculating GDP, and important macroeconomic identities.

**Q1.** What are the four factors of production and what are the remunerations to each of these called?

 **Note:** 'Remuneration' simply means payment or reward for a factor's contribution to production.

**Answer:**

| Factor of Production | Remuneration (Payment) | Example                                      |
|----------------------|------------------------|----------------------------------------------|
| Land                 | Rent                   | Monthly rent paid for a factory plot         |
| Labour               | Wages / Salaries       | Monthly salary of a factory worker           |
| Capital              | Interest               | Interest paid on a business loan             |
| Entrepreneurship     | Profit                 | Net earnings of a business owner after costs |

**Q2.** Why should the aggregate final expenditure of an economy be equal to the aggregate factor payments? Explain.

 **Note:** This is the fundamental circular flow identity: what is spent = what is earned. Money just goes in a circle!

**Answer:**

The equality between aggregate final expenditure and aggregate factor payments arises from the circular flow of income in an economy.

Here is the logic:

**Step 1 — Production:** Firms produce goods and services using factors of production (land, labour, capital, entrepreneurship). These factors are owned by households.

**Step 2 — Expenditure:** The value of goods and services produced is sold in the market. The total money spent by buyers (households, firms, government, foreigners) on purchasing these final goods and services is the aggregate final expenditure.

**Step 3 — Factor Payments:** The money received by firms from selling their output is used to pay for the factors of production — rent to land, wages to labour, interest to capital, and profit to entrepreneurs. The sum of all these payments is aggregate factor income.

Since every rupee spent on buying a final good becomes income for some factor of production, the two must be equal. There is no 'leakage' — money that goes out must come back in.

**Aggregate Final Expenditure = Aggregate Factor Payments = National Income**

This is why GDP can be calculated by three methods — expenditure, income, and product — and all three give the same result.

**Q3.** Distinguish between stock and flow. Between net investment and capital, which is a stock and which is a flow? Compare net investment and capital with flow of water into a tank.

 **Note:** *Stock = what you have at a point of time. Flow = what comes in/goes out over a period of time.*

**Answer:**

Stock refers to a quantity measured at a particular point in time. Flow refers to a quantity measured over a period of time (per hour, per year, etc.).

Examples: Your bank balance (say ₹10,000) on 1st January is a stock. The salary you receive per month (₹5,000) is a flow. Population on 1st March 2025 is a stock; births per year is a flow.

Now for the specific terms:

- Capital is a stock. It represents the total accumulated stock of produced goods (machines, factories, buildings) available at a given point in time. E.g., the total machinery a factory owns on 31st March is a stock.
- Net Investment is a flow. It is the net addition to the capital stock during a period of time (after accounting for depreciation). E.g., new machines purchased minus wear and tear of old machines during the year.

The Water Tank Analogy (very helpful!):

Imagine a water tank (reservoir). The volume of water currently stored in the tank = Capital (a stock). The flow of water being poured into the tank per minute/day = Net Investment (a flow). If you pour more water than evaporates (depreciation), the level in the tank rises. Similarly, if net investment is positive, capital stock grows over time.

**Capital (Stock) at end of year = Capital at start of year + Net Investment (Flow)**

**Q4.** What is the difference between planned and unplanned inventory accumulation? Write down the relation between change in inventories and value added of a firm.

 **Note:** *Inventories are the unsold goods sitting in a firm's warehouse. Their change tells us if production matched demand.*

**Answer:**

**Planned Inventory Accumulation:** When a firm intentionally decides to hold more stock (inventory) as part of its business strategy — e.g., a textile firm stockpiling cloth before the wedding season to meet expected demand. This is deliberate and is counted as intentional investment.

**Unplanned Inventory Accumulation:** When goods that were expected to be sold remain unsold, resulting in a build-up of inventory. For example, if a firm produced 100 units expecting to sell all of them, but could only sell 70 units, the remaining 30 units constitute unplanned inventory accumulation.

Unplanned inventory accumulation acts as a signal: if inventories are rising unexpectedly, firms will reduce production in the next period (since goods aren't selling). If inventories fall unexpectedly, firms will increase production.

Relation between Change in Inventories and Value Added:

**Value Added by a Firm = Value of Output Produced – Value of Intermediate Inputs Used**

**Value of Output Produced = Value of Sales + Change in Inventories**

So if a firm sells goods worth ₹500 and its inventories increased by ₹100 (i.e., ₹100 worth of goods unsold), then value of output = ₹600.

**Q5.** Write down the three identities of calculating the GDP of a country by the three methods. Also briefly explain why each of these should give us the same value of GDP.

 **Note:** GDP can be measured from three angles — like looking at the same elephant from three sides. You get the same animal!

**Answer:**

The three methods and their identities:

1. Product Method (Value Added Method):

$$\text{GDP} = \text{Sum of Value Added by all firms in all sectors of the economy}$$

Value Added = Sales Value of Output – Cost of Intermediate Inputs

2. Expenditure Method:

$$\text{GDP} = C + I + G + (X - M)$$

Where C = Private Consumption, I = Gross Investment, G = Government Purchases, X = Exports, M = Imports.

3. Income Method:

$$\text{GDP} = \text{Wages} + \text{Rent} + \text{Interest} + \text{Profit} + \text{Mixed Income}$$

(i.e., sum of all factor incomes earned in the economy during the year)

Why do all three give the same result?

They are three different 'windows' into the same circular flow of income. Consider: when a firm sells a final good, that sale represents: (a) value added in production [Product Method], (b) expenditure by someone buying it [Expenditure Method], and (c) income earned by the factors used to produce it [Income Method]. Since the same rupee flows through all three, they must be equal. This is the fundamental circular flow identity of macroeconomics.

**Q6.** Define budget deficit and trade deficit. The excess of private investment over saving of a country in a particular year was Rs 2,000 crores. The amount of budget deficit was (–) Rs 1,500 crores. What was the volume of trade deficit of that country?

 **Note:** This uses the national income identity:  $S + T + M = I + G + X$  (savings injections = leakages). Rearranging gives the key equation used here.

**Definitions:**

**Budget Deficit:** When a government's expenditure (G) exceeds its tax revenue (T). Budget Deficit =  $G - T$ . A budget surplus means  $T > G$ , represented by a negative deficit.

**Trade Deficit:** When a country's imports (M) exceed its exports (X). Trade Deficit =  $M - X$ . (Also called Current Account Deficit in a broader sense.)

**Calculation:**

The macroeconomic identity relating these three is:

$$(I - S) + (G - T) + (M - X) = 0$$

Or equivalently:

$$\text{Trade Deficit } (M - X) = (S - I) + (T - G)$$

Wait — let's rewrite using the signs given:

Given:

- Excess of Private Investment over Saving =  $(I - S) = \text{Rs } 2,000 \text{ crores}$

- Budget Deficit  $(G - T) = (-)$  Rs 1,500 crores [i.e., Government had a SURPLUS of Rs 1,500 crores, since a negative budget deficit = surplus]

The identity states:

$$(I - S) = (T - G) + (X - M)$$

$$2,000 = 1,500 + (X - M)$$

$$(X - M) = 2,000 - 1,500 = 500$$

$$\text{Therefore, } (M - X) = -500 \text{ crores}$$

Since  $M - X$  is negative, it means  $X > M$ , so there is a trade SURPLUS of Rs 500 crores.

Alternatively, if we interpret budget deficit as positive 1,500:

$$(I - S) = (G - T) + (X - M) \rightarrow 2,000 = -1,500 + (X - M) \rightarrow (X - M) = 3,500$$

Note: The sign convention for 'budget deficit was  $(-)$  Rs 1,500 crores' implies there was a budget surplus of Rs 1,500 crores. Using the identity  $(I - S) + (G - T) = (X - M)$ :  $2000 + (-1500) = 500$ . So Trade Surplus = Rs 500 crores, meaning Trade Deficit =  $-$  Rs 500 crores.

|               |                                |
|---------------|--------------------------------|
| Trade Balance | Trade Surplus of Rs 500 crores |
|---------------|--------------------------------|

**Q7.** Suppose the GDP at market price of a country in a particular year was Rs 1,100 crores. Net Factor Income from Abroad was Rs 100 crores. The value of Indirect taxes – Subsidies was Rs 150 crores and National Income was Rs 850 crores. Calculate the aggregate value of depreciation.

 **Note:** We need to navigate from GDP (MP) to National Income (NNP at FC) using a step-by-step chain.

**Step-by-Step Solution:**

Given:

- GDP at Market Price = Rs 1,100 crores
- Net Factor Income from Abroad (NFIA) = Rs 100 crores
- Indirect Taxes – Subsidies = Rs 150 crores
- National Income (NNP at Factor Cost) = Rs 850 crores

Step 1: Find GNP at Market Price

$$\text{GNP (MP)} = \text{GDP (MP)} + \text{NFIA} = 1,100 + 100 = \text{Rs } 1,200 \text{ crores}$$

Step 2: Find NNP at Market Price (NNP MP)

$$\text{NNP (MP)} = \text{GNP (MP)} - \text{Depreciation} = 1,200 - \text{Depreciation}$$

Step 3: Find NNP at Factor Cost (= National Income)

$$\text{NNP (FC)} = \text{NNP (MP)} - (\text{Indirect Taxes} - \text{Subsidies})$$

$$850 = \text{NNP (MP)} - 150$$

$$\text{NNP (MP)} = 850 + 150 = \text{Rs } 1,000 \text{ crores}$$

Step 4: Calculate Depreciation

$$\text{Depreciation} = \text{GNP (MP)} - \text{NNP (MP)} = 1,200 - 1,000 = \text{Rs } 200 \text{ crores}$$

|              |               |
|--------------|---------------|
| Depreciation | Rs 200 crores |
|--------------|---------------|

**Q8.** Net National Product at Factor Cost of a particular country in a year is Rs 1,900 crores. There are no interest payments made by households to firms/government or vice versa. Personal Disposable Income is Rs 1,200 crores. Personal income taxes paid are Rs 600 crores and retained earnings of firms and government are Rs 200 crores. What is the value of transfer payments made by the government and firms to the households?

 **Note:** Transfer payments are like scholarships, pensions, and subsidies — income received without producing anything in return.

**Step-by-Step Solution:**

Given:

- NNP at Factor Cost (National Income) = Rs 1,900 crores
- Personal Disposable Income (PDI) = Rs 1,200 crores
- Personal Income Tax = Rs 600 crores
- Retained Earnings of Firms and Government = Rs 200 crores
- Interest payments by/to households = 0

Step 1: Find Personal Income (PI)

$$\begin{aligned} \text{PDI} &= \text{PI} - \text{Personal Income Taxes} \\ 1,200 &= \text{PI} - 600 \\ \text{PI} &= \text{Rs } 1,800 \text{ crores} \end{aligned}$$

Step 2: Use the formula for Personal Income

$$\text{PI} = \text{NI} - \text{Retained Earnings} - \text{Corporate Tax} + \text{Transfer Payments}$$

Since there are no corporate taxes or interest payment distinctions mentioned, and retained earnings = Rs 200 crores:

$$\begin{aligned} 1,800 &= 1,900 - 200 + \text{Transfer Payments} \\ \text{Transfer Payments} &= 1,800 - 1,700 = \text{Rs } 100 \text{ crores} \end{aligned}$$

|                   |               |
|-------------------|---------------|
| Transfer Payments | Rs 100 crores |
|-------------------|---------------|

**Q9.** From the following data, calculate Personal Income and Personal Disposable Income.

 **Note:** Use the standard formulas:  $\text{NI} \rightarrow \text{PI} \rightarrow \text{PDI}$ , carefully adding and subtracting each item.

Given Data:

| Item                                | Rs (crore) |
|-------------------------------------|------------|
| Net Domestic Product at Factor Cost | 8,000      |
| Net Factor Income from Abroad       | 200        |
| Undisbursed Profit                  | 1,000      |
| Corporate Tax                       | 500        |
| Interest Received by Households     | 1,500      |
| Interest Paid by Households         | 1,200      |
| Transfer Income                     | 300        |
| Personal Tax                        | 500        |

Step 1: Calculate National Income (NNP at FC)

$$\text{NNP at FC} = \text{NDP at FC} + \text{NFIA} = 8,000 + 200 = \text{Rs } 8,200 \text{ crores}$$

Step 2: Calculate Personal Income (PI)

Personal Income = NNP at FC – Undisbursed Profits – Corporate Tax – Interest Paid by Households + Interest Received by Households + Transfer Income

$$\text{PI} = 8,200 - 1,000 - 500 - 1,200 + 1,500 + 300$$

$$\text{PI} = 8,200 - 2,700 + 1,800 = 7,300$$

|                      |                 |
|----------------------|-----------------|
| Personal Income (PI) | Rs 7,300 crores |
|----------------------|-----------------|

Step 3: Calculate Personal Disposable Income (PDI)

$$\text{PDI} = \text{PI} - \text{Personal Tax} = 7,300 - 500 = \text{Rs } 6,800 \text{ crores}$$

|                                  |                 |
|----------------------------------|-----------------|
| Personal Disposable Income (PDI) | Rs 6,800 crores |
|----------------------------------|-----------------|

**Q10.** In a single day, Raju the barber collects Rs 500 from haircuts. His equipment depreciates by Rs 50. He pays sales tax Rs 30, takes home Rs 200 and retains Rs 220 for new equipment. He pays Rs 20 as income tax. Calculate his contributions to (a) GDP (b) NNP at MP (c) NNP at FC (d) Personal Income (e) Personal Disposable Income.

 **Note:** Raju is self-employed, so he is both the producer AND the household. His business revenue flows through all national income concepts.

Given:

- Revenue from haircuts = Rs 500 (this is the value of output / GDP contribution)
- Depreciation of equipment = Rs 50
- Sales Tax paid = Rs 30 (this is indirect tax)
- Income taken home (wages to himself) = Rs 200
- Retained for new equipment = Rs 220
- Income tax paid = Rs 20

(a) GDP (Gross Domestic Product at Market Price): = Value of output = Rs 500 crores

 **Note:** GDP is the gross (before depreciation) market-price value of final output. Raju's haircuts are a final service.

(b) NNP at Market Price: = GDP – Depreciation = 500 – 50 = Rs 450

 **Note:** We deduct depreciation to get the 'net' (sustainable) value added.

(c) NNP at Factor Cost (National Income contribution): = NNP at MP – Indirect Taxes + Subsidies = 450 – 30 + 0 = Rs 420

 **Note:** Sales Tax is an indirect tax that goes to the government, not to factors of production. So we subtract it to find factor cost.

(d) Personal Income: = Income taken home = Rs 200 (his wages to himself)

 **Note:** Retained earnings (Rs 220) are not personal income as they stay in the business. They are undistributed profit.

(e) Personal Disposable Income: = Personal Income – Income Tax = 200 – 20 = Rs 180

| Measure                     | Value (Rs) |
|-----------------------------|------------|
| GDP (MP)                    | 500        |
| NNP at MP                   | 450        |
| NNP at FC (National Income) | 420        |
| Personal Income             | 200        |
| Personal Disposable Income  | 180        |

**Q11.** The value of the nominal GNP of an economy was Rs 2,500 crores in a particular year. The value of GNP at base year prices was Rs 3,000 crores. Calculate the value of the GNP deflator in percentage terms. Has the price level risen?

 **Note:** GNP Deflator compares current prices with base year prices to reveal inflation or deflation.

**Solution:**

$$\text{GNP Deflator} = (\text{Nominal GNP} / \text{Real GNP}) \times 100$$

$$\text{GNP Deflator} = (2,500 / 3,000) \times 100 = 83.33\%$$

Interpretation: The GNP deflator is 83.33%, which is less than 100. This means the general price level has **FALLEN** between the base year and the current year. In the current year, the same goods cost less than in the base year. This is deflation, not inflation.

 **Note:** If GNP Deflator > 100, prices have risen (inflation). If < 100, prices have fallen (deflation). Here it is  $83.33 < 100$ , so prices have fallen.

|              |                                        |
|--------------|----------------------------------------|
| GNP Deflator | 83.33% — Price level has <b>FALLEN</b> |
|--------------|----------------------------------------|

**Q12.** Write down some of the limitations of using GDP as an index of welfare of a country.

 **Note:** GDP tells us the size of the economy — but not how good life is for the average citizen.

**Answer:**

GDP is the most commonly used measure of economic activity, but it is a poor index of welfare (well-being) for the following reasons:

- 1. **Distribution of Income:** GDP may be high but concentrated in the hands of a few wealthy people. If income inequality is high, the majority of people may still be poor even though GDP is large. A country with high GDP but extreme inequality may have lower actual welfare than a country with lower but more evenly distributed GDP.
- 2. **Non-monetary Transactions:** GDP does not count activities that are not sold in the market. For example, a homemaker's domestic work (cooking, cleaning, childcare) is not counted in GDP, yet it contributes enormously to well-being.
- 3. **Externalities:** GDP does not account for negative externalities such as pollution, environmental degradation, or health hazards caused by production. A factory that pollutes a river increases GDP through its output but reduces the welfare of communities dependent on that river.

- 4. GDP does not capture quality of life indicators like life expectancy, literacy rates, access to healthcare, social security, or personal freedom.
- 5. Composition of GDP: GDP includes defence expenditure, expenditure on prisons, etc. These may not directly improve welfare, yet they add to GDP.
- 6. GDP at market prices may be distorted by indirect taxes and subsidies, and does not reflect actual factor incomes.

For a better measure of welfare, economists sometimes use the Human Development Index (HDI), which considers income, education, and health together.

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