Solution to Unsolved Numericals in the Textbook

National Income and Related Aggregates

1. Calculate Gross National Disposable Income from the following data:

Items	(₹ in crore)
(i) National income	2,000
(ii) Net factor income from abroad	(50
(iii) Consumption of fixed capital	200
(iv) Net current transfers from rest of the world	150
(v) Net indirect taxes	250

Sol. Gross National Disposable Income

= National income + Consumption of fixed capital + Net current transfers from rest of the world + Net indirect taxes

= ₹ 2,000 crore ₹ 200 crore ₹ 150 crore + ₹ 250 crore

= ₹ 2,600 crore

Ans. Gross national disposable income = ₹ 2,600 crore.

2. Find out National Disposable Income from the following data:

Items	(₹ in crore)
(i) Current transfers from government administrated departments	215
(ii) Saving of non-departmental enterprises	7
(iii) Net national product at factor cost	325
(iv) Net factor income from abroad	12
(v) Net current transfers from rest of the world	12
(vi) Indirect taxes	35
(vii) Subsidies	10

Sol. National Disposable Income

= Net national product at factor cost + Net current transfers from rest of the world + Net indirect taxes (Indirect tax – Subsidies)

= ₹ 325 crore + ₹ 12 crore + (₹ 35 crore – ₹ 10 crore)

= ₹ 325 crore + ₹ 12 crore + ₹ 25 crore

= ₹ 362 crore

Ans. National disposable income = ₹ 362 crore.

3. From the following data calculate National Income:

Items	(₹ in crore)
(i) Private income	1,200
(ii) National debt interest	40
(iii) Current transfers from the government administrative departments	40
(iv) Other current transfers from rest of the world	12
(v) Income from property and entrepreneurship accruing to government departments	16
(vi) Savings of government departmental enterprises	8

Sol. National Income

= Private income – National debt interest – Current transfers from the government administrative departments – Other current transfers from rest of the world + Income from property and entrepreneurship accruing to government departments + Savings of government departmental enterprises

= ₹ 1,200 crore – ₹ 40 crore – ₹ 40 crore – ₹ 12 crore + ₹ 16 crore + ₹ 8 crore

= ₹ 1,132 crore

Ans. National income = ₹ 1,132 crore.

4. Calculate Private Income from the following data:

Items	(₹ in crore)
(i) National debt interest	30
(ii) Gross national product at market price	400
(iii) Current transfers from government	20
(iv) Net indirect taxes	40
(v) Net current transfers from rest of the world	(–)10
(vi) Net domestic product at factor cost accruing to government	50
(vii) Consumption of fixed capital	70

Sol. Private Income

= Gross national product at market price – Net domestic product at factor cost accruing to government – Net indirect taxes – Consumption of fixed capital + National debt interest + Current transfers from government + Net current transfers from rest of the world

= ₹ 400 crore – ₹ 50 crore – ₹ 40 crore – ₹ 70 crore + ₹ 30 crore + ₹ 20 crore + (–) ₹ 10 crore

= ₹ 400 crore – ₹ 50 crore – ₹ 40 crore – ₹ 70 crore + ₹ 30 crore + ₹ 20 crore – ₹ 10 crore

= ₹ 280 crore

Ans. Private income = ₹ 280 crore.

5. Calculate Personal Income from the following data:

Items	(₹ in crore)
(i) Undistributed profits of corporations	20
(ii) Net domestic product accruing to private sector	500
(iii) Corporation tax	55
(iv) Net factor income from abroad	(–)10
(v) Net current transfers from government	15
(vi) National debt interest	40
(vii) Net current transfers from rest of the world	15

Sol. Personal Income

= Net domestic product accruing to private sector + Net factor income from abroad + Net current transfers from government + Net current transfers from rest of the world + National debt interest – Corporation tax – Undistributed profits of corporations

= ₹ 500 crore + (–) ₹ 10 crore + ₹ 15 crore + ₹ 15 crore + ₹ 40 crore – ₹ 55 crore – ₹ 20 crore

= ₹ 485 crore

Ans. Personal income = ₹ 485 crore.

6. From the following data estimate (a) Net Indirect Taxes, and (b) Net Domestic Product at Factor Cost:

Items	(₹ in crore)
(i) Net national product at market price	1,400
(ii) Net factor income from abroad	(–)20
(iii) Gross national product at factor cost	1,300
(iv) Consumption of fixed capital	100
(v) National debt interest	18

Sol. (a) Net Indirect Taxes

= Net national product at market price – Net national product at factor cost (Gross national product at factor cost – Consumption of fixed capital)

= ₹ 1,400 crore – (₹ 1,300 crore – ₹ 100 crore)

= ₹ 1,400 crore – ₹ 1,300 crore + ₹ 100 crore

= ₹ 200 crore

(b) Net Domestic Product at Factor Cost

= Gross national product at factor cost – Consumption of fixed capital – Net factor income from abroad

= ₹ 1,300 crore – ₹ 100 crore – (–) ₹ 20 crore

= ₹ 1,300 crore – ₹ 100 crore + ₹ 20 crore

= ₹ 1,220 crore

Ans. (a) Net indirect taxes = ₹ 200 crore.

(b) Net domestic product at factor cost = ₹ 1,220 crore.

7. From the following data estimate (a) National Income, (b) Personal Income, and (c) Private Income:

Items	**(₹ in crore)**
(i) Net national product at market price	1,015
(ii) Income from property and entrepreneurship accruing to government administrative departments	25
(iii) Indirect taxes	150
(iv) Subsidies	20
(v) Saving of non-departmental enterprises	5
(vi) National debt interest	10
(vii) Current transfers from government	25
(viii) Current transfers from rest of the world	10
(ix) Saving of private corporate sector	15
(x) Corporate profit tax	10

Sol. (a) National Income = Net national product at market price – Indirect taxes + Subsidies

= ₹ 1,015 crore – ₹ 150 crore + ₹ 20 crore

= ₹ 885 crore

(b) Personal Income

= National income – Income from property and entrepreneurship accruing to government administrative departments – Saving of non-departmental enterprises + National debt interest + Current transfers from government + Current transfers from rest of the world – Saving of private corporate sector – Corporate profit tax

= ₹ 885 crore – ₹ 25 crore – ₹ 5 crore + ₹ 10 crore + ₹ 25 crore + ₹ 10 crore – ₹ 15 crore – ₹ 10 crore

= ₹ 875 crore

(c) Private Income = Personal income + Saving of private corporate sector + Corporate profit tax

= ₹ 875 crore + ₹ 15 crore + ₹ 10 crore

= ₹ 900 crore

Ans. (a) National income = ₹ 885 crore.

(b) Personal income = ₹ 875 crore.

(c) Private income = ₹ 900 crore.

8. Calculate from the following data (a) Private Income, (b) Personal Disposable Income, and (c) Net National Disposable Income:

Items	**(₹ in crore)**
(i) National income	3,000
(ii) Savings of private corporate sector	30
(iii) Corporation tax	80
(iv) Current transfers from government administrative departments	60
(v) Income from property and entrepreneurship accruing to government administrative departments	150
(vi) Current transfers from rest of the world	50
(vii) Savings of non-departmental governments enterprises	40

(viii)	Net indirect taxes	250
(ix)	Direct taxes paid by households	100
(x)	Net factor income from abroad	(–)10

Sol. (a) Private Income

= National income + Current transfers from government administrative departments + Current transfers from rest of the world – Income from property and entrepreneurship accruing to government administrative departments – Saving of non-departmental governments enterprises

= ₹ 3,000 crore + ₹ 60 crore + ₹ 50 crore – ₹ 150 crore – ₹ 40 crore

= ₹ 2,920 crore

(b) Personal Disposable Income

= Private income – Savings of private corporate sector – Corporation tax – Direct taxes paid by households

= ₹ 2,920 crore – ₹ 30 crore – ₹ 80 crore – ₹ 100 crore

= ₹ 2,710 crore

(c) Net National Disposable Income

= National income + Net indirect taxes + Current transfers from the rest of the world

= ₹ 3,000 crore + ₹ 250 crore + ₹ 50 crore

= ₹ 3,300 crore

Ans. (a) Private income = ₹ 2,920 crore.

(b) Personal disposable income = ₹ 2,710 crore.

(c) Net national disposable income = ₹ 3,300 crore.

Methods of Calculating National Income

1. From the following about firm 'X', calculate Gross Value Added at Factor Cost by it:

	Items	**(₹ in thousand)**
(i)	Sales	500
(ii)	Opening stock	30
(iii)	Closing stock	20
(iv)	Purchase of intermediate products	300
(v)	Purchase of machinery	150
(vi)	Subsidy	40

Sol. Gross Value Added at Factor Cost by Firm X

= Sales + Change in stock (Closing stock – Opening stock) + Subsidy – Purchase of intermediate products

= ₹ 500 thousand + (₹ 20 thousand – ₹ 30 thousand) + ₹ 40 thousand – ₹ 300 thousand

= ₹ 500 thousand – ₹ 10 thousand + ₹ 40 thousand – ₹ 300 thousand

= ₹ 230 thousand

Ans. Gross value added at factor cost by firm X = ₹ 230 thousand.

2. From the following about firm 'Y', calculate Net Value Added at Market Price by it:

	Items	**(₹ in thousand)**
(i)	Sales	300
(ii)	Depreciation	20
(iii)	Net indirect taxes	30
(iv)	Purchase of intermediate products	150
(v)	Change in stock	( )10
(vi)	Purchase of machinery	100

Sol. Net Value Added at Market Price by Firm Y

= Sales + Change in stock – Purchase of intermediate products – Depreciation

= ₹ 300 thousand + (–) ₹ 10 thousand – ₹ 150 thousand – ₹ 20 thousand

= ₹ 120 thousand

Ans. Net value added at market price by firm Y = ₹ 120 thousand.

3. Calculate Operating Surplus from the following data:

	tems	**(₹in crore)**
(i)	Rent	120
(ii)	Profit	200
(iii)	Domestic income	800
(iv)	Mixed income	70
(v)	Wages and salaries	350
(vi)	Indirect tax	150
(vii)	Subsidies	50
(viii)	Depreciation	200

Sol. Operating Surplus

= Domestic income – Wages and salaries – Mixed income

= ₹ 800 crore – ₹ 350 crore – ₹ 70 crore

= ₹ 380 crore

Ans. Operating surplus = ₹ 380 crore.

4. Calculate GDP_{MP} and NDP_{MP} with the help of expenditure method from the data give below:

	Items	**(₹in crore)**
(i)	Personal disposable income	8,600
(ii)	Personal savings	1,500
(iii)	Fixed capital formation	3,000
(iv)	Net exports	(–)300
(v)	Net factor income from abroad	(–)500
(vi)	Net indirect taxes	600
(vii)	Government final consumption expenditure	2,200
(viii)	Change in stock	800
(ix)	Consumption of fixed capital	450

Sol. GDP_{MP}

= Personal disposable income – Personal savings + Net exports + Fixed capital formation + Change in stock + Government final consumption expenditure

= ₹ 8,600 crore – ₹ 1,500 crore + (–) ₹ 300 crore + ₹ 3,000 crore + ₹ 800 crore + ₹ 2,200 crore

= ₹ 12,800 crore

NDP_{MP} = GDP_{MP} – Consumption of fixed capital

= ₹ 12,800 crore – ₹ 450 crore

= ₹ 12,350 crore

Ans. GDP_{MP} = ₹ 12,800 crore.

NDP_{MP} = ₹ 12,350 crore.

5. From the following data calculate National Income:

	Items	**(₹in crore)**
(i)	Compensation of employees	800
(ii)	Rent	200
(iii)	Wages and salaries	750

(iv)	Net exports	(–)30
(v)	Net factor income from abroad	(–)20
(vi)	Profit	300
(vii)	Interest	100
(viii)	Depreciation	50
(ix)	Remittances from abroad	80
(x)	Taxes on profits	60

Sol. National Income

= Compensation of employees + Rent + Profit + Interest + Net factor income from abroad [Income method]

= ₹ 800 crore + ₹ 200 crore + ₹ 300 crore + ₹ 100 crore + (–) ₹ 20 crore

= ₹ 1,380 crore

Ans. National income = ₹ 1,380 crore.

6. Find out Factor Income from Net Domestic Product accruing to the Private Sector from the following data:

	Items	**(₹ in crore)**
(i)	Operating Surplus	30
(ii)	Income from property and entrepreneurship accruing to government administrative departments	5
(iii)	Compensation of employees	100
(iv)	Mixed income of the self-employed	180
(v)	Saving of non-departmental enterprises	5

Sol. Factor Income from Net Domestic Product accruing to Private Sector

= Compensation of employees + Operating surplus + Mixed income of the self-employed – Income from property and entrepreneurship accruing to government administrative departments – Saving of non-departmental enterprises

= ₹ 100 crore + ₹ 30 crore + ₹ 180 crore – ₹ 5 crore – ₹ 5 crore

= ₹ 300 crore

Ans. Factor income from net domestic product accruing to private sector = ₹ 300 crore.

7. From the following data, calculate: (a) Personal Disposable Income, and (b) National Income:

	Items	**(₹ in crore)**
(i)	Private income	3,000
(ii)	Compensation of employees	800
(iii)	Mixed income of self-employed	900
(iv)	Net factor income from abroad	( )50
(v)	Net retained earnings of private enterprises	600
(vi)	Rent	350
(vii)	Profit	600
(viii)	Consumption of fixed capital	200
(ix)	Direct taxes paid by households	300
(x)	Corporation tax	350
(xi)	Net indirect taxes	250
(xii)	Net exports	( )70
(xiii)	Interest	450

Sol. (a) Personal Disposable Income

= Private income – Net retained earnings of private enterprises – Corporation tax – Direct taxes paid by households

= ₹ 3,000 crore – ₹ 600 crore – ₹ 350 crore – ₹ 300 crore

= ₹ 1,750 crore

(b) National Income

= Compensation of employees + Rent + Profit + Interest + Mixed income of self-employed + Net factor income from abroad

= ₹ 800 crore + ₹ 350 crore + ₹ 600 crore + ₹ 450 crore + 900 crore + (–) 50 crore

= ₹ 3,050 crore

Ans. (a) Personal disposable income = ₹ 1,750 crore.

(b) National income = ₹ 3,050 crore.

8. Calculate Net Domestic Product at Factor Cost and Gross National Disposable Income from the following data:

	Items	**(₹in crore)**
(i)	Net current transfers from abroad	(–)5
(ii)	Private final consumption expenditure	250
(iii)	Net factor income from abroad	15
(iv)	Government final consumption expenditure	50
(v)	Consumption of fixed capital	25
(vi)	Net exports	(–)10
(vii)	Subsidies	10
(viii)	Net domestic capital formation	30
(ix)	Indirect tax	20

Sol. Net Domestic Product at Factor Cost

= Private final consumption expenditure + Government final consumption expenditure + Net domestic capital formation + Net exports – Indirect taxes + Subsidies

= ₹ 250 crore + ₹ 50 crore + ₹ 30 crore + (–) ₹ 10 crore – ₹ 20 crore + ₹ 10 crore

= ₹ 310 crore

Gross National Disposable Income

= NDP_{FC} + Net current transfers from abroad + Net indirect taxes + Consumption of fixed capital + Net factor income from abroad

= ₹ 310 crore + (–) ₹ 5 crore + (₹ 20 crore – ₹ 10 crore) + ₹ 25 crore + ₹ 15 crore

= ₹ 310 crore – ₹ 5 crore + ₹ 10 crore + ₹ 25 crore + ₹ 15 crore

= ₹ 355 crore

Ans. Net domestic product at factor cost = ₹ 310 crore.

Gross national disposable income = ₹ 355 crore.

9. Calculate National Income and Net National Disposable Income from the following data:

	Items	**(₹in crore)**
(i)	Net current transfers to abroad	15
(ii)	Net exports	(–)20
(iii)	Private final consumption expenditure	400
(iv)	Net factor income to abroad	10
(v)	Government final consumption expenditure	100
(vi)	Indirect tax	30
(vii)	Net domestic capital formation	50
(viii)	Change in stocks	7
(ix)	Subsidy	5

Sol. National Income

= Private final consumption expenditure + Government final consumption expenditure + Net domestic capital formation + Net exports – Net factor income to abroad – Net indirect taxes (Indirect tax – Subsidy)

= ₹ 400 crore + ₹ 100 crore + ₹ 50 crore + (–) ₹ 20 crore – ₹ 10 crore – (₹ 30 crore – ₹ 5 crore)

= ₹ 495 crore

Net National Disposable Income

= National income + Net indirect taxes – Net current transfers to abroad

= ₹ 495 crore + (₹ 30 crore – ₹ 5 crore) – ₹ 15 crore

= ₹ 495 crore + ₹ 25 crore – ₹ 15 crore

= ₹ 505 crore

Ans. National income = ₹ 495 crore.

Net national disposable income = ₹ 505 crore.

10. From the following data, calculate National Income by (a) income method, and (b) expenditure method:

	Items	**(₹ in crore)**
(i)	Private final consumption expenditure	2,000
(ii)	Net capital formation	400
(iii)	Change in stock	50
(iv)	Compensation of employees	1,900
(v)	Rent	200
(vi)	Interest	150
(vii)	Operating surplus	720
(viii)	Net indirect tax	400
(ix)	Employers' contribution to social security schemes	100
(x)	Net exports	20
(xi)	Net factor income from abroad	( )20
(xii)	Government final consumption expenditure	600
(xiii)	Consumption of fixed capital	100

Sol. (a) Income Method:

National Income

= Compensation of employees + Operating surplus + Net factor Income from abroad

= ₹ 1,900 crore + ₹ 720 crore + (–) ₹ 20 crore

= ₹ 2,600 crore

(b) Expenditure Method:

National Income

= Private final consumption expenditure + Government final consumption expenditure + Net capital formation + Net exports + Net factor income from abroad Net indirect taxes

= ₹ 2,000 crore + ₹ 600 crore + ₹ 400 crore + ₹ 20 crore + (₹ 20 crore ₹ 400 crore

= ₹ 2,600 crore

Ans. National income (by income and expenditure methods) = ₹ 2,600 crore.

11. From the following data calculate Net National Product at Factor Cost by (a) income method, and (b) expenditure method:

	Items	**(₹ in crore)**
(i)	Current transfers from rest of the world	100
(ii)	Government final consumption expenditure	1,000
(iii)	Wages and salaries	3,800
(iv)	Dividend	500
(v)	Rent	200
(vi)	Interest	150
(vii)	Net domestic capital formation	500
(viii)	Profits	800
(ix)	Employers' contribution to social security schemes	200
(x)	Net exports	(– 50
(xi)	Net factor income from abroad	(–)30

(xii)	Consumption of fixed capital	40
(xiii)	Private final consumption expenditure	4,000
(xiv)	Net indirect tax	300

Sol. (a) Income Method:

Net National Product at Factor Cost

= Wages and salaries + Profit + Rent + Interest + Employers' contribution to social security schemes + Net factor income from abroad

= ₹ 3,800 crore + ₹ 800 crore + ₹ 200 crore + ₹ 150 crore + ₹ 200 crore + (–) ₹ 30 crore

= ₹ 5,120 crore

(b) Expenditure Method:

Net National Product at Factor Cost

= Government final consumption expenditure + Net domestic capital formation + Net exports + Private final consumption expenditure + Net factor income from abroad – Net indirect tax

= ₹ 1,000 crore + ₹ 500 crore + (–) ₹ 50 crore + ₹ 4,000 crore + (–) ₹ 30 crore – ₹ 300 crore

= ₹ 5,120 crore

Ans. Net national product at factor cost (by income and expenditure methods) = ₹ 5,120 crore.

12. From the following data relating to a firm, (a) estimate the Net Value Added at Market Price, (b) show that Net Value Added at Factor Cost is equal to the sum of factor incomes.

	Items	**(₹in thousand)**
(i)	Salaries and wages	120
(ii)	Interest payments	90
(iii)	Dividends	30
(iv)	Undistributed profits	20
(v)	Rent payments	15
(vi)	Increase in stocks	40
(vii)	Imports of raw material	20
(viii)	Indirect taxes	10
(ix)	Depreciation of fixed capital	15
(x)	Domestic sales	360
(xi)	Exports	40
(xii)	Domestic purchase of raw materials and other inputs	120

Sol. (a) Net Value Added at Market Price

= (Domestic sales + Exports + Increase in stocks) – (Domestic purchase of raw materials and other inputs + Imports of raw material) – Depreciation of fixed capital

= (₹ 360 thousand + ₹ 40 thousand + ₹ 40 thousand) (₹ 120 thousand + ₹ 20 thousand) – ₹ 15 thousand

= ₹ 285 thousand

(b) (i) Net Value Added at Factor Cost

= Net value added at market price – Indirect taxes

= ₹ 285 thousand – ₹ 10 thousand

= ₹ 275 thousand

(ii) Sum of Factor Incomes

= Salaries and wages + Interest payments + Dividends + Undistributed profits + Rent payments

= ₹ 120 thousand + ₹ 90 thousand + ₹ 30 thousand + ₹ 20 thousand + ₹ 15 thousand

= ₹ 275 thousand

Ans. (a) Net value added at market price = ₹ 285 thousand.

(b) Net value added at factor cost = Sum of factor incomes = ₹ 275 thousand.

Aggregate Demand and its Components

1. Find the value of C, when $\bar{C} = 50$, Y = 500 and marginal propensity to consume is 0.2.

Sol. We know that, $C = \bar{C} + bY$

$= 50 + 0.2(500)$

$= 50 + 100$

$= 150$

Ans. Consumption (C) = 150.

2. Find saving, when $\bar{S} = 100$, Y = 500 and marginal propensity to save = 0.4.

Sol. We know that, $S = -\bar{S} + sY$

$= -100 + 0.4(500)$ (s = MPS = 0.4)

$= -100 + 200$

$= 100$

Ans. Saving (S) = 100.

3. Find the values of marginal propensity to consume and marginal propensity to save from the following data:

Income (₹)	Saving (₹)
750	150
1,000	200

Sol.

Income (Y) (₹)	Change in Income (Y) (₹)	Saving (S) (₹)	Consumption (C) (₹)	Change in Consumption (C) (₹)
750		150	600	–
1,000	1,000 750 = 250	200	800	800 600 = 200

Marginal propensity to consume = $\frac{C}{Y}$ $\frac{200}{250}$ 0.8

MPS = 1 – MPC

= 1 – 0.8 = 0.2

Ans. MPC = 0.8.

MPS = 0.2.

4. What will be the value of average propensity to save when

(i) C = 200 at Y = 1,000?

(ii) S = 450 at Y = 1,200?

Sol. $APS = \frac{S}{Y}$

(i) We know that, $S = Y - C$

$= 1,000 - 200$

$= 800$

$APS = \frac{S}{Y}$ $\frac{800}{1,000}$

$= 0.8$

(ii) When S = 450 and Y = 1,200

$APS = \frac{S}{Y}$ $\frac{450}{1,200}$

$= 0.375$

Ans. (i) APS = 0.8.

(ii) APS = 0.375.

5. Complete the following table:

Level of Income (₹)	Consumption Expenditure (₹)	Marginal Propensity to Consume	Marginal Propensity to Save
1,000	900		
1,200	1,060		
1,400	1,210		
1,600	1,350		

Sol.

Level of Income (Y) (₹)	Consumption Expenditure (C) (₹)	Saving (S) = Y – C (₹)	Marginal Propensity to Consume (MPC) = $\frac{C}{Y}$	Marginal Propensity to Save (MPS) = $\frac{S}{Y}$
1,000	900	100	—	
1,200	1,060	140	0.8	0.2
1,400	1,210	190	0.75	0.25
1,600	1,350	250	0.7	0.3

6. Complete the following table:

Income (₹)	Consumption Expenditure (₹)	Marginal Propensity to Consume	Average Propensity to Save
0	20		
50	55		
100	90		
150	125		

Sol.

Income (Y) (₹)	Consumption (C) (₹)	Saving (S) = Y – C (₹)	Marginal Propensity to Consume (MPC) = $\frac{C}{Y}$	Average Propensity to Save (APS) = $\frac{S}{Y}$
0	20	–20	—	—
50	55	–5	$\frac{35}{50}$ 0.7	$\frac{-5}{50}$ –0.1
100	90	10	$\frac{35}{50}$ 0.7	$\frac{10}{100}$ 0.1
150	125	25	$\frac{35}{50}$ 0.7	$\frac{25}{150}$ 0.16

7. Complete the following table:

Income (₹)	Marginal Propensity to Consume	Saving (₹)	Average Propensity to Save	Average Propensity to Consume
0	0.5	–80		
50	0.5	—		
100	0.5	—		
150	0.5	—		
200	0.5	—	—	—

Sol.

Income (Y) (₹)	Marginal Propensity to Consume (MPC)	Saving (S) = Y – C (₹)	Consumption (C) (₹)	Average Propensity to Save (APS) = $\frac{S}{Y}$	Average Propensity to Consume (APC) = $\frac{C}{Y}$
0	—	–80	80	—	—
50	0.5	–55	80 + 25 = 105	$\frac{-55}{50} = 1.1$	$\frac{105}{50} = 2.1$
100	0.5	–30	80 + 50 = 130	$\frac{-30}{100} = -0.3$	$\frac{130}{100} = 1.3$
150	0.5	–5	80 + 75 = 155	$\frac{-5}{150} = -0.03$	$\frac{155}{150} = 1.03$
200	0.5	20	80 + 100 = 180	$\frac{20}{200} = 0.1$	$\frac{180}{200} = 0.9$

[**Hint:** $C = \overline{C} + cY$; where, $\overline{C} = 80$ at $Y = 0$ and $c = 0.5$.]

Short Run Equilibrium Output

1. If the value of multiplier is 4

(i) what will be MPC and MPS?

(ii) What will be marginal propensity to consume when marginal propensity to save is 0.2?

Sol. (i) $K = \frac{1}{MPS}$

Substituting, $K = 4$

$$4 = \frac{1}{MPS}$$

$$MPS = \frac{1}{4} = 0.25$$

$$MPC = 1 \quad MPS = 1 \quad 0.25 = 0.75$$

(ii) $MPC = 1 \quad MPS = 1 \quad 0.2$

$MPC = 0.8$

Ans. (i) MPC = 0.75; MPS = 0.25.

(ii) MPC = 0.8.

2. In an economy investment expenditure is increased by ₹ 700 crore. The marginal propensity to consume is 0.9. Calculate the total increase in income and consumption expenditure.

Sol. MPC = 0.9; I = ₹ 700 crore

$$\text{Multiplier (K)} = \frac{1}{1 \quad MPC}$$

$$= \frac{1}{1 \quad 0.9} \quad \frac{1}{0.1} \quad 10$$

$$\text{Increase in income } (\quad Y) = K \quad I$$

$$= 10 \times ₹\ 700 \text{ crore}$$

$$= ₹\ 7{,}000 \text{ crore}$$

$$\text{Increase in consumption } (\quad C) = \quad Y \quad MPC$$

$$= ₹\ 7{,}000 \text{ crore} \times 0.9$$

$$= ₹\ 6{,}300 \text{ crore}$$

Ans. Increase in income = ₹ 7,000 crore.

Increase in consumption expenditure = ₹ 6,300 crore.

3. In an economy investment expenditure is increased by ₹ 400 crore and marginal propensity to consume is 0.8. Calculate the total increase in income and saving.

Sol. MPC = 0.8; I = ₹ 400 crore

$$\text{Multiplier (K)} = \frac{1}{1 \quad \text{MPC}}$$

$$= \frac{1}{1 \quad 0.8} \quad \frac{1}{0.2} \quad 5$$

$$\text{MPS} = 1 \quad \text{MPC}$$

$$= 1 - 0.8 = 0.2$$

$$\text{Increase in income } (\ Y) = K \quad I$$

$$= 5 \times 400$$

$$= ₹\ 2{,}000 \text{ crore}$$

$$\text{Increase in saving} = \quad Y \times \text{MPS}$$

$$= ₹\ 2{,}000 \text{ crore} \times 0.2$$

$$= ₹\ 400 \text{ crore}$$

Ans. Increase in income = ₹ 2,000 crore.

Increase in saving = ₹ 400 crore.

4. In an economy, investment is increased by ₹ 600 crore. If the marginal propensity to consume is 0.6, calculate the total increase in income and consumption expenditure.

Sol. MPC = 0.6; I = ₹ 600 crore

$$\text{Multiplier (K)} = \frac{1}{1 \quad \text{MPC}}$$

$$= \frac{1}{1 \quad 0.6} = \frac{1}{0.4} \quad 2.5$$

$$\text{Increase in income } (\ Y) = K \times \quad I$$

$$= 2.5 \times ₹\ 600 \text{ crore}$$

$$= ₹\ 1{,}500 \text{ crore}$$

$$\text{Increase in consumption } (\ C) = \quad Y \times \text{MPC}$$

$$= ₹\ 1{,}500 \text{ crore} \quad 0.6$$

$$= ₹\ 900 \text{ crore}$$

Ans. Increase in income = ₹ 1,500 crore.

Increase in consumption expenditure = ₹ 900 crore.

5. A ₹ 200 crore increase in investment leads to a rise in national income by ₹ 1,000 crore. Find out marginal propensity to consume.

Sol. Given, increase in investment (I) = ₹ 200 crore

Increase in national income (Y) = ₹ 1,000 crore

We know,

$$\text{Multiplier (K)} = \frac{Y}{I} = \frac{1{,}000}{200} = 5$$

We also know,

$$K = \frac{1}{1 - \text{MPC}}$$

$$1 - \text{MPC} = \frac{1}{5}$$

$$1 - \text{MPC} = 0.2$$

$$\text{MPC} = 1 - 0.2 = 0.8$$

Ans. Marginal propensity to consume = 0.8.

6. An increase in investment leads to total rise in national income by ₹ 500 crore. If marginal propensity to consume is 0.9. What is the increase in investment? Calculate.

Sol. Increase in national income (Y) = ₹ 500 crore

MPC = 0.9

We know,

$$\text{Multiplier (K)} = \frac{1}{1 \quad \text{MPC}}$$

$$= \frac{1}{1 - 0.9}$$

$$= \frac{1}{1 - 0.1} = 10$$

We also know,

$$K = \frac{Y}{I}$$

$$I = \frac{Y}{K} = \frac{500}{10} = 50$$

Ans. Increase in investment = ₹ 50 crore.

7. Given marginal propensity to save equal to 0.25, what will be the increase in national income if investment increases by ₹ 125 crore? Calculate.

Sol. Given, MPS = 0.25

Increase in investment (I) = ₹ 125 crore

We know,

$$\text{Multiplier (K)} = \frac{1}{1 \quad \text{MPC}} = \frac{1}{\text{MPS}}$$

$$= \frac{1}{0.25} = 4$$

We also know,

$$K = \frac{Y}{I}$$

$$Y = K \times \quad I$$

$$= 4 \times 125$$

$$= 500$$

Ans. Increase in national income = ₹ 500 crore.

8. It is planned to increase national income by ₹ 1,000 crore. How much increase in investment is required to achieve this goal? Assume that marginal propensity to consume is 0.6. Calculate.

Sol. Desired increase in national income = ₹ 1,000 crore

MPC = 0.6

We know,

$$\text{Multiplier (K)} = \frac{1}{1 \quad \text{MPC}}$$

$$= \frac{1}{1 \quad 0.6} = \frac{1}{0.4} = 2.5$$

We also know,

$$K = \frac{Y}{I}$$

$$I = \frac{Y}{K}$$

$$= \frac{1{,}000}{2.5} \quad 400$$

Ans. Desired increase in investment = ₹ 400 crore.

9. An increase in investment by ₹ 400 crore leads to increase in national income by ₹ 1,600 crore. Calculate marginal propensity to consume.

Sol. Increase in investment (I) = ₹ 400 crore

Increase in national income (Y) = ₹ 1,600 crore

$$\text{Multiplier (K)} = \frac{Y}{I}$$

$$K = \frac{1,600}{400} = 4$$

We know, $$K = \frac{1}{1 \quad MPC}$$

$$4 = \frac{1}{1 \quad MPC}$$

$$1 - MPC = \frac{1}{4}$$

$$1 - MPC = 0.25$$

$$MPC = 1 - 0.25$$

$$= 0.75$$

Ans. Marginal propensity to consume = 0.75.

10. An increase in investment by ₹ 500 crore leads to increase in national income by ₹ 2,500 crore. Calculate marginal propensity to consume and change in saving.

Sol. Increase in investment (I) = ₹ 500 crore

Increase in national income (Y) = ₹ 2,500 crore

$$\text{Multiplier (K)} = \frac{Y}{I}$$

$$K = \frac{2,500}{500} = 5$$

We know, $$K = \frac{1}{1 \quad MPC}$$

$$5 = \frac{1}{1 \quad MPC}$$

$$1 - MPC = \frac{1}{5}$$

$$1 - MPC = 0.2$$

$$MPC = 1 - 0.2$$

$$MPC = 0.8$$

We also know, MPC + MPS = 1

Or, $$MPS = 1 - MPC$$

$$= 1 - 0.8$$

$$= 0.2$$

Change in saving (S) = Y MPS

= ₹ 2,500 crore 0.2

= ₹ 500 crore

Ans. Marginal propensity to consume = 0.8.

Change in saving = ₹ 500 crore.

Government Budget and The Economy

1. Total expenditure of a government budget is ₹ 75,000 crore and total receipts is ₹ 45,000 crore. How much is the budget deficit?

Sol. Budget Deficit = Total expenditure Total receipts

= ₹ 75,000 crore – ₹ 45,000 crore

= ₹ 30,000 crore

Ans. Budget deficit = ₹ 30,000 crore.

2. Calculate budgetary deficit from following data:

Items	**(₹ in crore)**
(i) Revenue expenditure	60,000
(ii) Capital expenditure	30,000
(iii) Revenue receipts	50,000
(iv) Capital receipts	25,000

Sol. Budgetary Deficit = Revenue expenditure + Capital expenditure (Revenue receipts + Capital receipts)

= ₹ 60,000 crore + ₹ 30,000 crore – ₹ 50,000 crore – ₹ 25,000 crore

= ₹ 90,000 crore – ₹ 75,000 crore

= ₹ 15,000 crore

Ans. Budgetary deficit = ₹ 15,000 crore.

3. Find fiscal deficit from the information given below:

Items	**(₹ in lakh)**
(i) Borrowing by the government	600
(ii) Revenue receipts	100
(iii) Capital receipts	750
(iv) Interest payment	150

Sol. Fiscal Deficit = Borrowing by the government

= ₹ 600 lakh

Ans. Fiscal deficit = ₹ 600 lakh.

4. Find primary deficit from the following data:

Items	**(₹ in crore)**
(i) Fiscal deficit	9,000
(ii) Interest payment by the government	900

Sol. Primary Deficit = Fiscal deficit Interest payment by the government

= ₹ 9,000 crore – ₹ 900 crore

= ₹ 8,100 crore

Ans. Primary deficit = ₹ 8,100 crore.

5. In a government budget, primary deficit is ₹ 10,000 crore and interest payment is ₹ 8,000 crore. How much is the fiscal deficit?

Sol. Fiscal Deficit = Primary deficit + Interest payment by the government

= ₹ 10,000 crore + ₹ 8,000 crore

= ₹ 18,000 crore

Ans. Fiscal deficit = ₹ 18,000 crore.

Balance of Payments

1. The balance of trade shows a deficit of ₹ 4,000 crore and the value of imports are ₹ 10,000 crore. What is the value of exports?

Sol. Balance of trade = (₹ 4,000 crore

Value of imports = ₹ 10,000 crore

Balance of Trade = Exports Imports

Exports = Balance of trade (Deficit) + Import

= – ₹ 4,000 crore + ₹ 10,000 crore

= ₹ 6,000 crore

Ans. Value of exports = ₹ 6,000 crore.

2. The balance of trade shows a deficit of ₹ 500 crore. The value of exports are ₹ 400 crore. What is the value of imports?

Sol. Balance of Trade = Exports Imports = ₹ 500 crore

Imports = Exports Balance of trade (Deficit)

= ₹ 400 crore (₹ 500 crore

= ₹ 900 crore

Ans. Value of imports = ₹ 900 crore.

3. Find current account balance from the following data:

Items	**(₹ in lakh)**
(i) Balance of visible trade	9,000
(ii) Export of services	9,000
(iii) Import of services	3,000

Sol. Current Account Balance

= Balance of visible trade + Balance of invisibles (Export of services – Import of services)

= ₹ 9,000 lakh + ₹ 9,000 lakh – ₹ 3,000 lakh

= ₹ 15,000 lakh

Ans. Current account balance = ₹ 15,000 lakh.

4. Find the balance on non-factor services from the following information:

Items	**(₹ in crore)**
(i) Balance of visible trade	500
(ii) Income	200
(iii) Transfers	100
(iv) Current account balance	900

Sol. Current Account Balance

= Trade balance + Balance on non-factor services + Balance on income + Balance on transfers

Or,

Balance on Non-factor Services

= Current account balance – Trade balance – Balance on income – Balance on transfers

= ₹ 900 crore ₹ 500 crore ₹ 200 crore ₹ 100 crore

= ₹ 100 crore

Ans. Balance on non-factor services = ₹ 100 crore.

5. If balance of trade shows a surplus of ₹ 300 crore and unilateral payments is ₹ 50 crore, how much is the balance on the capital account of balance of payments?

Sol. Capital Account Balance

= Current account balance + Unilateral payments

= ₹ 300 crore + ₹ 50 crore

= ₹ 350 crore

Ans. Capital account shows a deficit of ₹ 350 crore.