DETERMINATION OF NATIONAL INCOME
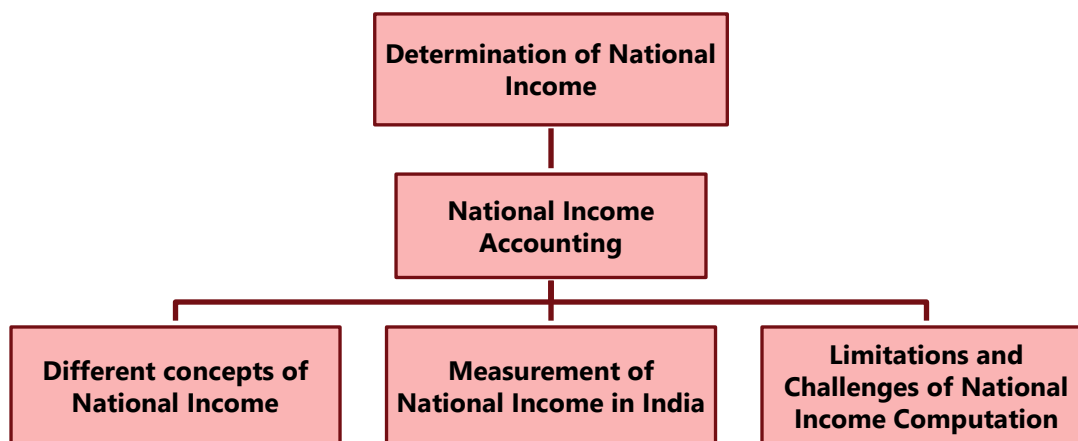
UNIT - 1: NATIONAL INCOME ACCOUNTING

LEARNING OUTCOMES

After studying this Chapter, you will be able to understand:

♦ Define national income

♦ Explain the usefulness and significance of national income estimates

♦ Differentiate among the various concepts of national income

♦ Describe the different methods of calculation of national income

♦ Outline measurement of national income in India

♦ Describe the system of regional accounts in India

♦ Identify the challenges involved in national income computation.

CHAPTER OVERVIEW

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1.1   NATIONAL INCOME ACCOUNTING

National Income Accounting, pioneered by the Nobel prize-winning economists Simon Kuznets and Richard Stone, is the system of macro-economic accounts from the stage of production of goods and services to the stage of their final disposal. Like any other accounting system , the national income accounts first define concepts and then construct measures corresponding to these concepts . National Accounts help us to understand how the various transactions from the stage of production of goods and services to the stage of their final disposal are interrelated and give us an idea of the working of an economy. It helps to meet the needs of Government, private analysts, policy makers and decision takers.

The Central Statistical Organisation (CSO) in the Ministry of Statistics and Programme Implementation (MoSP&I) is responsible for the compilation of National accounts statistics. At the State level, State Directorates of Economics and Statistics (DESs) have the responsibility of compiling their State Domestic Product and other aggregates.

1.2   USEFULNESS AND SIGNIFICANCE OF NATIONAL INCOME ESTIMATES

National income accounts are fundamental aggregate statistics in macroeconomic analysis and are extremely useful, especially for the emerging and transition economies.

♦   businesses to forecast the future demand for their products.

♦ The estimates of national income show the composition and structure of national income in terms of different sectors of the economy, the periodical variations in them and the broad sectoral shifts in an economy over time.

♦ Sectoral contribution to National Income information is used by the government to decide various sector-specific development policies to increase growth rates.

♦ National income statistics also provide a quantitative basis for macroeconomic modelling and analysis, for assessing and choosing economic policies and for objective statements as well as evaluation of governments' economic policies.

♦ National income estimates throw light on income distribution and the possible inequality in the distribution among different income categories . It facilitates the process of comparisons of structural statistics, such as ratios of investment to growth , taxes proceeds and fiscal deficit , or government expenditures to GDP.

♦ International comparisons in respect of incomes and living standards assist in determining eligibility for loans, and/or other funds or conditions under which such loans, and/ or funds are made available.

♦ Combined with financial and monetary data, national income data provides a guide to make policies for growth and inflation.

1.3 DIFFERENT CONCEPTS OF NATIONAL INCOME

We begin our discussion with the basic measure of output -Gross Domestic Product, or GDP. The production side of the economy transforms inputs, such as labour and capital, into output, GDP. Inputs such as labour and capital are called factors of production, and the payments made to factors, such as wages and interest payments, are called factor payments.

1.3.1 Gross Domestic Product

Nominal GDP or GDP$_{MP}$

Gross domestic product (GDP) is the value of all final goods and services produced in the country within a given period. It includes the value of goods produced, such as houses and mobiles, and the value of services, such as telecom, health, insurance. The output of each of these is valued at its market price, and the values are added together to get GDP$_{MP}$

Nominal GDP or GDP at Current Prices in Q1 2022-23 is estimated at ₹ 64.95 lakh crore, as against ₹ 51.27 lakh crore in Q1 2021-22, showing a growth of 26.7 percent as compared to 32.4 percent in Q1 2021-22
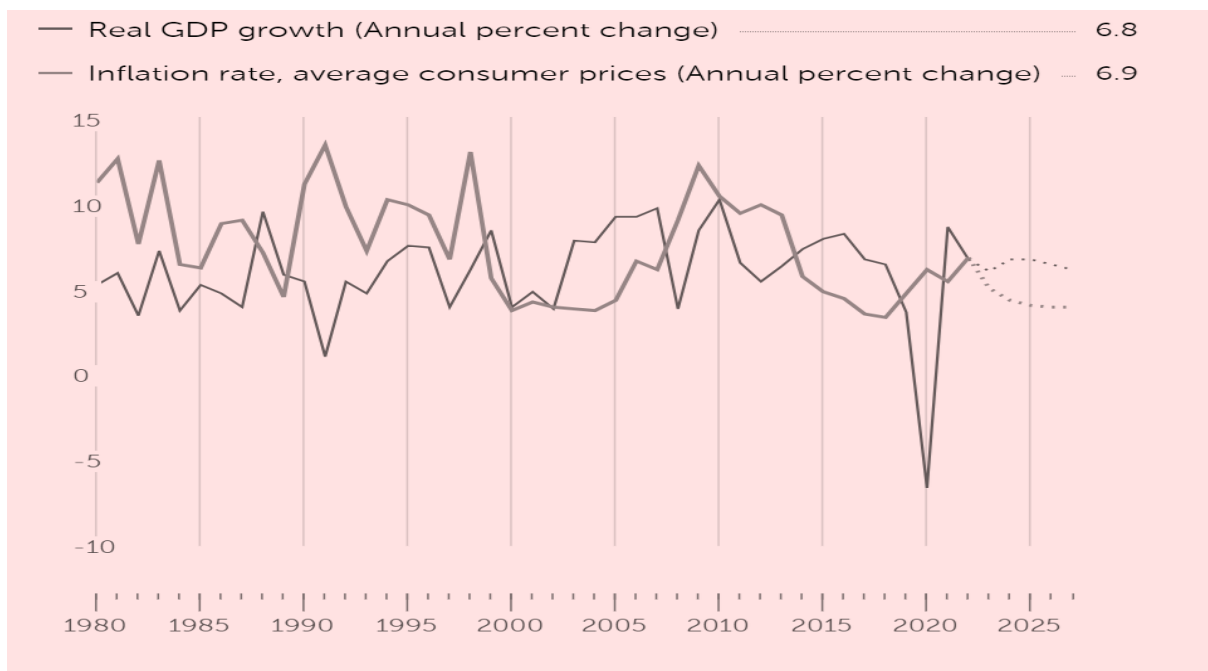
Real GDP

Nominal GDP increases over time for two reasons:

1.   The production of most of goods increases over time

2.   The prices of most goods also increase over time.

If our goal is to measure production and its change over time, we need to eliminate the effect of increasing prices on our measure of GDP. That's why real GDP is constructed as the sum of the quantities of final goods times constant (rather than current prices)

Real GDP or Gross Domestic Product (GDP) at Constant (2011-12) Prices in Q1 2022-23 is estimated to attain a level of ₹ 36.85 lakh crore, as against ₹ 32.46 lakh crore in Q1 2021-22, showing a growth of 13.5 percent as compared to 20.1 percent in Q1 2021-22

REAL GDP GROWTH RATE AND INFLATION RATE

Source IMF Data Mapper Oct 2022 https://www.imf.org/en/Countries/IND

GDP Deflator

The calculation of real GDP gives us a useful measure of inflation known as GDP deflator. The GDP deflator is the ratio of nominal GDP in a given year to real GDP of that year.

$$\text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

The GDP deflator, as the name implies, can be used to 'deflate' or take inflation out of GDP. In other words, the GDP deflator is a price index used to convert nominal GDP to real GDP

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{GDP Deflator}} \times 100$$

The deflator measures the current level of prices relative to the level of prices in the base year. Since nominal GDP and real GDP must be the same in the base year, the deflator for the base year is always 100.

As you know, inflation is a closely monitored aspect of macroeconomic performance and a significant variable guiding macroeconomic policy. Using the GDP deflator, the inflation rate between two consecutive years can be compute using the following procedure:

$$\text{Inflation rate in year 2} = \frac{\text{GDP deflator in year 2 - GDP deflator in year 1}}{\text{GDP deflator in year 1}} \times 100$$

GDP Deflator in India is expected to reach **154.87 points** by the end of 2022, according to Trading Economics global macro models and analysts expectations. In the long-term, the India GDP Deflator is projected to trend around **167.94** points in 2023 and **175.67** points in 2024, according to econometric models.

Inflation Rate in 2023 = (167.94 - 154.87) / 154.87 * 100

Inflation Rate in 2023 as compared to 2022 will be 8.439 percent.

Numerical Illustrations

ILLUSTRATION 1

Find out GDP Deflator? Interpret It

			(In Billion Rs.)
Years	**Nominal GDP**	**Real GDP**	**GDP Deflator**
2014	500	500	100
2015	800	650	123.08
2016	1150	800	143.75
2017	1300	950	136.84
2018	1550	1190	130.25
2019	1700	1240	137.10

SOLUTION

A deflator above 100 is an indication of price levels being higher as compared to the base year. From years 2015 through 2019, we find that price levels are higher than that of the base year, the highest being in the year 2016.If the GDP deflator is greater than 100, then nominal

GDP is greater than real GDP. If the GDP deflator next year is less than the GDP deflator this year, then the price level has fallen; if it is greater, price levels have increased.

ILLUSTRATION 2

The nominal and real GDP respectively of a country in a particular year are ₹ 3000 Crores and ₹ 4700 Crores respectively. Calculate GDP deflator and comment on the level of prices of the year in comparison with the base year.

SOLUTION

Nominal GDP =   ₹ 3000 Crores

Real GDP   =   ₹ 4700 Crores

$$\text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

$$\frac{3000}{4700} \times 100 = 63.83$$

The price level has fallen since GDP deflator is less than 100 at 63.83.

ILLUSTRATION 3

Find nominal GDP if real GDP = 450 and price index = 120

SOLUTION

$$\text{Nominal GDP} = \text{Real GDP} \times \frac{\text{Price Index}}{100}$$

$$\text{Nominal GDP} = 450 \times \frac{120}{100} = 540$$

ILLUSTRATION 4

Suppose nominal GNP of a country in 2010 is given at ₹ 600 Crores and price index is given as base year 2010 is 100. Now let the nominal GDP increases to ₹ 1200 Crores in 2018 and the price index rises to 110, find out real GDP?

SOLUTION

$$\text{Real GDP} = \text{Nominal GDP} \times \frac{100}{\text{Price Index}}$$

$$= 1200 \ \frac{100}{110} = 1090.9 \text{ Crores}$$

Net Domestic Product

As you know capital wears out, or depreciates, while it is being used to produce output, Net Domestic Product (NDP) is equal to **GDP minus depreciation**. NDP thus comes closer to measuring the net amount of goods and services produced in the country in a given period of time. It is the total value of production minus the value of capital used up in producing that output. Other considerations such as asset obsolescence and complete destruction are also taken into account by the NDP.

> **NDP $_{MP}$ = GDP $_{MP}$ – Depreciation**

As you are aware, the basis of distinction between 'gross' and 'net' is depreciation or consumption of fixed capital.

> **Gross = Net + Depreciation or Net = Gross – Depreciation**

1.3.2 Gross National Product (GNP)

Gross National Product (GNP) is a measure of the market value of all final economic goods and services, produced within the domestic territory of a country by normal residents during an accounting year including net factor incomes from abroad. It is the total income earned by a nation's permanent residents (called nationals). It differs from GDP by including income that our citizens earn abroad and excluding income that foreigners earn here. Profits earned by Apple from its Indian manufacturing operations is part of India's GDP but these profits are part of USA's GNP.

Gross National Product (GNP) is evaluated at market prices and therefore it is in fact Gross National Product at market prices (GNP $_{MP}$).

GNP $_{MP}$ = GDP $_{MP}$ + Factor income earned by the domestic factors of production employed in the rest of the world **-** Factor income earned by the factors of production of the rest of the world employed in the domestic territory.

> **GNP $_{MP}$ = GDP $_{MP}$ + Net Factor Income from Abroad**

> **GDP $_{MP}$ = GNP $_{MP}$ – Net Factor Income from Abroad (NFIA)**

NFIA is the difference between the aggregate amount that a country's citizens and companies earn abroad, and the aggregate amount that foreign citizens and overseas companies earn in that country.

> **NFIA = Net compensation of employees + Net income from property and entrepreneurship + Net retained earnings**

If Net Factor Income from Abroad is positive, then GNP$_{MP}$ would be greater than GDP$_{MP}$.

You might have noticed that the distinction between 'national' and 'domestic' is net factor income from abroad.

> **National = Domestic + Net Factor Income from Abroad**

1.3.5 Net National Product at Market Prices (NNP$_{MP}$)

Net National Product at Market Prices (NNP$_{MP}$) is a measure of the market value of all final economic goods and services, produced by normal residents within the domestic territory of a country including Net Factor Income from Abroad during an accounting year excluding depreciation.

> **NNP$_{MP}$ = GNP$_{MP}$ – Depreciation**
>
> **NNP$_{MP}$ = NDP$_{MP}$ + Net Factor Income from Abroad**
>
> **NNP$_{MP}$ = GDP$_{MP}$ + Net Factor Income from Abroad – Depreciation**

1.3.6 Gross Domestic Product at Factor Cost (GDP$_{FC}$)

Gross domestic product (GDP) at factor cost is **GDP at market prices minus net indirect taxes**. The money value of output produced within a country's domestic limits in a year, as received by the factors of production, is measured by GDP at factor cost.

Thus, we find that the basis of distinction between market price and factor cost is net indirect taxes (i.e., Indirect taxes - Subsidies).

> **Market Price = Factor Cost + Net Indirect Taxes**
>
> **= Factor Cost + Indirect Taxes – Subsidies**

> **Factor Cost = Market Price - Net Indirect Taxes**
>
> **= Market Price - Indirect Taxes + Subsidies**

> **Gross Domestic Product at Factor Cost (GDP$_{FC}$)**
>
> **= GDP$_{MP}$ – Indirect Taxes + Subsidies**
>
> **= Compensation of employees**
>
> **+ Operating Surplus (rent + interest+ profit)**
>
> **+ Mixed Income of Self- employed**
>
> **+ Depreciation**

GDP at Factor Cost

Industry	₹ in crore) Gross Domestic Product		Percentage change over previous year
	Previous Year	Present Year	
	Q2	Q2	Q2
1. agriculture, forestry and fishing	131,550	135,789	3.2
2. mining and quarrying	25,509	24,774	-2.9
3. manufacturing	187,763	192,849	2.7
4. electricity, gas and water supply	22,894	25,137	9.8
5. construction	91,556	95,489	4.3
6. trade, hotels, transport and communication	311,166	342,080	9.9
7. financing, ins., real est. and business services	208,644	230,627	10.5
8. community, social and personal services	169,390	180,511	6.6
GDP at factor cost	**1,148,472**	**1,227,254**	**6.9**

Factor Cost vs Basic Price vs Market Price

At this stage, we need to clearly understand the difference between the concepts: 'market price' and 'factor cost and Basic Price

GDP at Basic Price excludes any taxes on products the producer receives from the purchaser and passes on to the government (Eg: GST or Sales Tax or Services Tax) but includes any subsidies the producer receives from the government and uses to lower the prices charged to purchasers. In simple terms, the basic price is the subsidised price without tax.

Basic price = factor cost + Production taxes – Production subsidy

Relationship between Factor Cost and Basic Price:

Factor cost + production tax – production subsidies = Basic prices.

Relationship between Basic Price and Market Price:

Basic Price + Product tax – Product Subsidy = Market Price.

Note: Thus, market price includes both product tax as well as production tax while excluding both product and production subsidies.

1.3.7 Net Domestic Product at Factor Cost (NDP$_{FC}$)

Net Domestic Product at Factor Cost (NDP$_{FC}$)is defined as the total factor incomes earned by the factors of production. In other words, it is sum of domestic factor incomes or domestic income net of depreciation.

As mentioned above, market price includes indirect taxes imposed by government.   We have to deduct indirect taxes and add the subsidies in order to calculate that part of domestic product which actually accrues to the factors of production. The measure that we obtain so is called Net Domestic Product at factor cost.

NDP$_{FC}$ = NDP $_{MP}$ – Net Indirect Taxes

> **= Compensation of employees**
>
> **+ Operating Surplus (rent + interest+ profit)**
>
> **+ Mixed Income of Self- employed**

1.3.8 Net National Product at Factor Cost (NNP$_{FC}$)or National Income

National Income is defined as the factor income accruing to the normal residents of the country during a year. It is the sum of domestic factor income and net factor income from abroad. In other words, national income is the value of factor income generated within the country plus factor income from abroad in an accounting year.

NNP$_{FC}$ = National Income = FID (factor income earned in domestic territory) + NFIA.

If NFIA is positive, then national income will be greater than domestic factor incomes.

1.3.9 Per Capita Income

The GDP per capita is a measure of a country's economic output per person. It is obtained by dividing the country's gross domestic product, adjusted by inflation, by the total population. It serves as an indicator of the standard of living of a country.

1.3.10 Personal Income

While national income is income earned by factors of production, Personal Income is the income received by the household sector including Non-Profit Institutions Serving Households. Thus, national income is a measure of income earned and personal income is a measure of actual current income receipts of persons from all sources which may or may not be earned from productive activities during a given period of time. Examples of this include transfer payments such as social security benefits, unemployment compensation, welfare

payments etc. Individuals also contribute income which they do not actually receive; for example, undistributed corporate profits and the contribution of employers to social security. Personal income excludes retained earnings, indirect business taxes, corporate income taxes and contributions towards social security. Households receive interest payments from the firms and governments; they also make interest payments to firms and governments. As such, the net interest paid by households to firms and government is also deducted from national income. Personal income forms the basis for consumption expenditures and is derived from national income as follows:

> **PI = NI + income received but not earned – income earned but not received.**
>
> **PI = NI - Undistributed profits – Net interest payments made by households – Corporate Tax +Transfer Payments to the households from firms and government.**

An important point to remember is that national income is not the sum of personal incomes because personal income includes transfer payments (eg. pension) which are excluded from national income. Further, not all national income accrues to individuals as their personal income.

1.3.11 Disposable Personal Income (DI)

Disposable personal income is a measure of the amount of the money in the hands of the individuals that is available for their consumption or savings. Disposable personal income is derived from personal income by subtracting the direct taxes paid by individuals and other compulsory payments made to the government.

> **DI = PI - Personal Income Taxes – Non tax payments**

Apart from the above aggregates, a few other aggregates are reported in India. These reflect the amount of goods and services the domestic economy has at its disposal. Two more concepts need to be understood, namely:

1. **Net National Disposable Income**

    Net National Disposable Income (NNDI) = Net National Income + other net current transfers from the rest of the world (Receipts less payments)

    Net National Disposable Income (NNDI) = NNI + net taxes on income and wealth receivable from abroad + net social contributions and benefits receivable from abroad.

2. **Gross National Disposable Income (GNDI)** = NNDI + CFC = GNI + other net current transfers from the rest of the world (Receipts less payments)

    (Other Current Transfers refer to current transfers other than the primary incomes)

(For a detailed explanation of concepts please refer 'Glossary of Main Terms' Apr 1, 2020 - National Accounts Statistics-Sources & Methods, 2007, MOSPI)

Domestic Income may be categorized into:

1.   Income from domestic product accruing to the public sector which includes income from property and entrepreneurship accruing to government administrative departments and savings of non-departmental enterprises.

2.   Income from domestic product accruing to private sector = NDP_{FC} - Income from property and entrepreneurship accruing to government administrative departments - Savings of non-departmental enterprises.

1.3.12 Private Income

Private income is a measure of the income (both factor income and transfer income) which accrues to private sector from all sources within and outside the country.

Private Income = Factor income from net domestic product accruing to the private sector + Net factor income from abroad + National debt interest + Current transfers from government + Other net transfers from the rest of the world.

Numerical Illustrations

ILLUSTRATION 5

From the following data, calculate NNP_{FC}, NNP_{MP}, GNP_{MP} and GDP_{MP}.

Items	*₹ in Crores*
Operating surplus	*2000*
Mixed income of self-employed	*1100*
Rent	*550*
Profit	*800*
Net indirect tax	*450*
Consumption of fixed capital	*400*
Net factor income from abroad	*-50*
Compensation of employees	*1000*

SOLUTION

GDP_{MP} = Compensation of employees + mixed income of self-employed + operating surplus + depreciation + net indirect taxes

(Note: operating surplus = rent+ profit + interest)

$$= 1000 + 1100 + 2000 + 400 + 450 = 4950$$

$GNP_{MP} = GDP_{MP} + NFIA = 4950 + (-50) = 4900$

$NNP_{MP} = GNP_{MP}$ P consumption of fixed capital = $4900 - 400 = 4500$

NNP_{FC} or NI = $NNP_{MP} - NIT = 4500 - 450 = = 4050$ Crores

ILLUSTRATION 6

From the following data, estimate National Income and Personal Income.

Items	₹. in Crores
Net national product at market price	1,891
Income from property and entrepreneurship accruing to government administrative departments	45
Indirect taxes	175
Subsidies	30
Saving of non-departmental enterprises	10
Interest on National debt	15
Current transfers from government	35
Current transfers from rest of the world	20
Saving of private corporate sector	25
Corporate profit tax	25

SOLUTION

National Income = Net national product at market price – Indirect taxes + Subsidies

= 1,891 – 175 + 30 = 1746crores

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

= 1746 – 45 –10+ 15 + 35 + 20 – 25 – 25

= 1711 Crores

ILLUSTRATION 7

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

SOLUTION

Given

GDP_{MP} = 1100 Crores, NFIA = 100 Crores, NIT =150 Crores, NNP_{FC} = 850 Crores

∴ GDP_{FC} = GDP_{MP}- NIT = 1100 – 150 = 950

GNP_{FC} = GDP_{FC}+ NFIA = 950 + 100 = 1050

NNP_{FC} = GNP_{FC}- Depreciation

850 = 1050- Depreciation

Depreciation = 1050 – 850 = 200 Crores.

ILLUSTRATION 8

On basis of following information, calculate NNP at market price and Disposable personal income

Items	₹ in Crores
NDP at factor cost	14900
Income from domestic product accruing to government	150
Interest on National debt	170
Transfer payment by government	60
Net private donation from abroad	30
Net factor income from abroad	80
Indirect taxes	335
Direct taxes	100
Subsidies	262
Taxes on corporate profits	222
Undistributed profits of corporations	105

SOLUTION

NNP at Market price   = NNP at factor cost +indirect tax-subsidies

Where NNP at factor cost   = NDP_{FC} + NFIA

$$= 14900 + 80 = 14980$$

Therefore, NNP $_{MP}$ = Therefore, NNP $_{MP}$ = 14980 + 335 − 262 = 15053

Disposable personal income (DI) = PI- Personal income tax

PI = NI + income received but not earned – income earned but not received
= 14980+ 170+60 +30 -150 -222- 105 = 14763

Therefore, DI= 14763- 100 = 14663 Crores

1.4   MEASUREMENT OF NATIONAL INCOME IN INDIA

1.4.1 The Circular Flow of Income

Circular flow of income refers to the continuous circulation of production, income generation and expenditure involving different sectors of the economy. There are three different interlinked phases in a circular flow of income, namely: production, distribution and disposition as can be seen from the following figure.

Figure 1.1.1

Circular Flow of Income
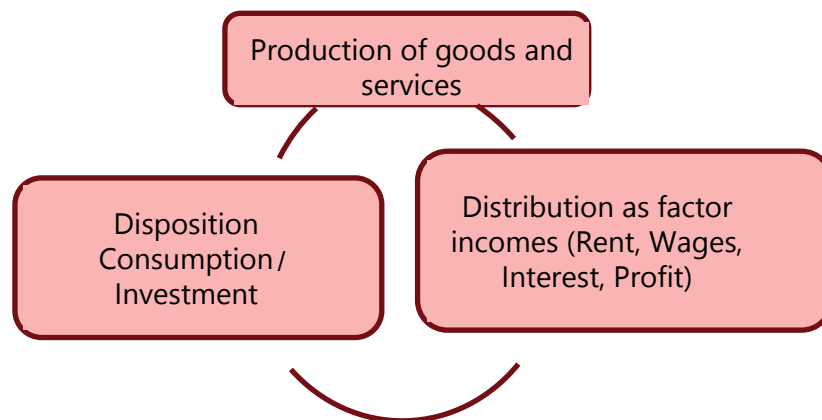
(i)   In the production phase, firms produce goods and services with the help of factor services.

(ii)   In the income or distribution phase, the flow of factor incomes in the form of rent, wages, interest and profits from firms to the households occurs

(iii)   In the expenditure or disposition phase, the income received by different factors of production is spent on consumption goods and services and investment goods. This expenditure leads to further production of goods and services and sustains the circular flow.

These processes of production, distribution and disposition keep going on simultaneously and enable us to look at national income from three different angles namely: as a flow of production or value added, as a flow of income and as a flow of expenditure. Each of these different ways of looking at national income suggests a different method of calculation and requires a different set of data. The details in respect of what is measured and what data are required for all three methods mentioned above are given in the following table.

Table 1.1.1

Data requirements and Outcomes of Different Methods of National Income Calculation

Method	Data required	What is measured
Phase of Output: Value added method (Product Method)	The sum of net values added by all the producing enterprises of the country	Contribution of production units
Phase of income: Income Method	Total factor incomes generated in the production of goods and services	Relative contribution of factor owners
Phase of disposition: Expenditure method	Sum of expenditures of the three spending units in the economy, namely, government, consumer households, and producing enterprises	Flow of consumption and investment expenditures

Corresponding to the three phases, there are three methods of measuring national income. They are: Value Added Method (alternatively known as Product Method); Income Method; and Expenditure Method.

1.4.2 Value Added Method or Product Method

National income by value added method is the sum total of net value added at factor cost across all producing units of the economy. The value added method measures the contribution of each producing enterprise in the domestic territory of the country in an accounting year and entails consolidation of production of each industry less intermediate purchases from all other industries. This method of measurement shows the unduplicated contribution by each industry to the total output. This method involves the following steps:

Step1. Identifying the producing enterprises and classifying them into different sectors according to the nature of their activities

All the producing enterprises are broadly classified into three main sectors namely:

(i)   Primary sector,

(ii)   Secondary sector, and

(iii)   Tertiary sector or service sector

These sectors are further divided into sub-sectors and each sub-sector is further divided into commodity group or service-group.

Step 2. Estimating the gross value added (GVA_{MP}) by each producing enterprise (This is the same as GDP_{MP})

Gross value added (GVA $_{MP}$) = Value of output – Intermediate consumption

= (Sales + change in stock) – Intermediate consumption

(Note that imports are included in the value of intermediate consumption if total purchases are given. If domestic purchases are specifically mentioned, then imports will also be added. Also, sales include exports, if domestic sales are separately mentioned, exports need to be added)

Step 3. Estimation of National income

For each individual unit, Net value added is found out.

∑ (GVA $_{MP}$) – Depreciation = Net value added (NVA $_{MP}$)

By adding net value-added or net products of all the sub-sectors of a sector, we get the value-added or net product of that sector. For the economy as a whole, we add the net products contributed by each sector to get Net Domestic Product. We subtract net indirect taxes and add net factor income from abroad to get national income.

Net value added (NVA $_{MP}$) – Net Indirect taxes = Net Domestic Product (NVA $_{FC}$)

Net Domestic Product (NVA $_{FC}$) + (NFIA) = National Income (NNP $_{FC}$)

The values of the following items are also included:

(i)   Own account production of fixed assets by government, enterprises and households.

(ii)   Imputed value of production of goods for self- consumption, and

(iii) Imputed rent of owner occupied houses.

(iv)   Change in stock(inventory)

1.4.3 Income Method

Production is carried out by the combined effort of all factors of production. The factors are paid factor incomes for the services rendered. In other words, whatever is produced by a producing unit is distributed among the factors of production for their services.

Under Factor Income Method, also called Factor Payment Method or Distributed Share Method, national income is calculated by summation of factor incomes paid out by all production units within the domestic territory of a country as wages and salaries, rent, interest, and profit. By definition, it includes factor payments to both residents and non‑ residents.

Thus,

NDP_{FC} = Sum of factor incomes paid out by all production units within the domestic territory of a country

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NNP $_{FC}$ or National Income= Compensation of employees

+ Operating Surplus (rent + interest+ profit)

+ Mixed Income of Self- employed

+ Net Factor Income from Abroad

Only incomes earned by owners of primary factors of production are included in national income. Thus, while wages of labourers will be included, pensions of retired workers will be excluded from national income. Compensation of employees includes, apart from wages and salaries, bonus, dearness allowance, commission, employers' contribution to provident fund and imputed value of compensation in kind. Non-labour income includes rent (actual and imputed), royalty, interest on loans availed for productive services, dividends, undistributed profits of corporations before taxes, and profits of unincorporated enterprises and of government enterprises.

(Note: Interest paid by the government on public debt, interest on consumption loans and interest paid by one firm to another are excluded.

Profit =Corporate taxes+ dividend retained+ earnings)

While using income method, capital gains, windfall profits, transfer incomes and income from sale of second-hand goods and financial assets and payments out of past savings are not included. However, commissions, brokerages and imputed value of services provided by owners of production units will be included as these add to the current flow of goods and services.

Usually it is difficult to separate labour income from capital income because in many instances people provide both labour and capital services. Such is the case with self-employed people

like lawyers, engineers, traders, proprietors etc. In economies where subsistence production and small commodity production is dominant, most of the incomes of people would be of mixed type. In sectors such as agriculture, trade, transport etc. in underdeveloped countries (including India), it is difficult to differentiate between the labour element and the capital element of incomes of the people. In order to overcome this difficulty a new category of incomes, called 'mixed income' is introduced which includes all those incomes which are difficult to separate.

1.4.4 Expenditure Method

In the expenditure approach, also called Income Disposal Approach, national income is the aggregate final expenditure in an economy during an accounting year.

$$GDP_{MP} = \sum \text{Final Expenditure}$$

In this approach to measuring GDP which considers the demand side of the products, we add up the value of the goods and services purchased by each type of final user mentioned below.

1. **Final Consumption Expenditure**

    (a)   Private Final Consumption Expenditure (PFCE)

    To measure this, the volume of final sales of goods and services to consumer households and non-profit institutions serving households acquired for consumption (not for use in production) are multiplied by market prices and then summation is done. It also includes the value of primary products which are produced for own consumption by the households, payments for domestic services which one household renders to another, the net expenditure on foreign financial assets or net foreign investment. Land and residential buildings purchased or constructed by households are not part of PFCE. They are included in gross capital formation. Thus, only expenditure on final goods and services produced in the period for which national income is to be measured and net foreign investment are included in the expenditure method of calculating national income.

    (b)   Government Final Consumption Expenditure

    Since the collective services provided by the governments such as defence, education, healthcare etc. are not sold in the market, the only way they can be valued in money terms is by adding up the money spent by the government in the production of these services. This total expenditure is treated as consumption expenditure of the government. Government expenditure on pensions, scholarships, unemployment allowance etc. should be excluded because these are transfer payments.

2.   Gross Domestic Capital formation

Gross domestic fixed capital formation (Gross Investment) is that part of country's total expenditure which is not consumed but added to the nation's fixed tangible assets and stocks. It consists of the acquisition of fixed assets and the accumulation of stocks. The stock accumulation is in the form of changes in stock of raw materials, fuels, finished goods and semi-finished goods awaiting completion. Thus, gross investment includes final expenditure on machinery and equipment and own account production of machinery and equipment, expenditure on construction, expenditure on changes in inventories, and expenditure on the acquisition of valuables such as, jewellery and works of art.

3.   Net Exports

Net exports are the difference between exports and imports of a country during the accounting year. It can be positive or negative.

How do we arrive at national income or NNP_{FC} using the expenditure method?

$GDP_{MP} = C + GDFC + NX$

$GNP_{MP} = GDP_{MP} + NFIA$

$GNP_{FC} = GNP_{MP} - NIT$

$NNP_{FC} = GNP_{FC} - Depreciation$

Ideally, all the three methods of national income computation should arrive at the same figure. When the national income of a country is measured separately using these methods, we get a three dimensional view of the economy. Each method of measuring GDP is subject to measurement errors and each method provides a check on the accuracy of the other methods. By calculating total output in several different ways and then trying to resolve the differences, we will be able to arrive at a more accurate measure than would be possible with one method alone. Moreover, different ways of measuring total output give us different insights into the structure of our economy.

Income method may be most suitable for developed economies where people properly file their income tax returns. With the growing facility in the use of the commodity flow method of estimating expenditures, an increasing proportion of the national income is being estimated by expenditure method. As a matter of fact, countries like India are unable to estimate their national income wholly by one method. Thus, in the agricultural sector, net value added is estimated by the production method, in the small scale sector net value added is estimated by the income method and in the construction sector net value added is estimated by the expenditure method.

Numerical Illustrations

ILLUSTRATION 9

Calculate National Income by Value Added Method with the help of following data -

Particulars	₹ (in Crores)
Sales	700
Opening stock	500
Intermediate Consumption	350
Closing Stock	400
Net Factor Income from Abroad	30
Depreciation	150
Excise Tax	110
Subsidies	50

SOLUTION

$NVA_{(FC)}$	= $GDP_{(MP)}$ –Depreciation +NFIA- Net Indirect Tax
Where $GVA_{(MP)}$	= Value of output- intermediate consumption
Value of Output	= Sales+ change in stock
	= 700+ (400-500)=600
$GVA_{(MP)}$	= 600 – 350= 250
Therefore NI	= 250-150 +30-(110-50)
	= 70 Crores

ILLUSTRATION 10

Calculate the Operating Surplus with the help of following data -

Particulars	₹ in Crores
Sales	4000
Compensation of employees	800
Intermediate consumption	600
Rent	400
Interest	300

Net indirect tax	*500*
Consumption of Fixed Capital	*200*
Mixed Income	*400*

SOLUTION

GVA_{MP}	= Gross Value Output$_{MP}$ – Intermediate consumption
	= (Sales + change in stock) – Intermediate consumption
	= 4000-600 = 3400
GDP_{MP}	= GVA_{MP} = 3400 Crores
NDP_{MP}	= GDP_{MP} – consumption of fixed capital
	= 3400 – 200
	= 3200 Crores
NDP_{FC}	= NDP_{MP} – NIT
	= 3200 – 500 = 2700 Crores
NDP_{FC}	= Compensation of employees + Operating surplus + Mixed income
2700	= 800 + Operating Surplus + 400

Operating surplus = 1500 Crores

ILLUSTRATION 11

Calculate national income by value added method.

Particulars	(₹ in crores)
Value of output in primary sector	2000
Intermediate consumption of primary sector	200
Value of output of secondary sector	2800
Intermediate consumption of secondary sector	800
Value of output of tertiary sector	1600
Intermediate consumption of tertiary sector	600
Net factor income from abroad	-30
Net indirect taxes	300
Depreciation	470

SOLUTION

GDP_{MP} = (Value of output in primary sector - intermediate consumption of primary sector) + (value of output in secondary sector - intermediate consumption of secondary sector) + (value of output in tertiary sector - intermediate consumption of tertiary sector)

Value of output in primary sector	=	2000
- Intermediate consumption of primary sector	=	200
+ Value of output in secondary sector	=	2800
- Intermediate consumption in secondary sector	=	800
+ Value of output in tertiary sector	=	1600
- Intermediate consumption of tertiary sector	=	600
GDP_{MP} =		₹ **4800 Crores**

$NNP_{FC} = GDP_{MP} + NFIA - NIT - Depreciation$

NNP_{FC} = National income = 4800 + (-30) - 300 - 470　　　　= **4000 Crores**

ILLUSTRATION 12

Calculate Net Value Added by Factor Cost from the following data

Items	₹ in Crores
Purchase of materials	85
Sales	450
Depreciation	30
Opening stock	40
Closing stock	30
Excise tax	45
Intermediate consumption	200
Subsidies	15

SOLUTION

GVA_{MP} = Sales + change in stock - Intermediate consumption

= 450 + (30-40) - 200

= 240 Crores

NVA_{MP} = GVA_{MP} – Depreciation

NVA_{MP} = 240-30 = 210 Crores

NVA_{FC} = NVA_{MP} – (indirect tax - subsidies)

= 210 – (45 -15) = 180Crores

ILLUSTRATION 13

Calculate NI with the help of Expenditure method and income method with the help of following data:

Items	₹ in Crores
Compensation of employees	1,200
Net factor income from Abroad	20
Net indirect taxes	120
Profit	800
Private final consumption expenditure	2,000
Net domestic capital formation	770
Consumption of fixed capital	130
Rent	400
Interest	620
Mixed income of self-employed	700
Net export	30
Govt. final consumption expenditure	1100
Operating surplus	1820
Employer's contribution to social security scheme	300

SOLUTION

By Expenditure method

GDP_{MP} = Private final consumption expenditure + Government final consumption expenditure + Gross domestic capital formation (Net domestic capital formation+ depreciation) + Net export

= 2000 + 1100 + (770+ 130) + 30= 4030Crores

NNP_{FC} or NI = GDP_{MP}- depreciation + NFIA – NIT

  = 4030 – 130 + 20 – 120= 3800 Crores

By Income method

NNP_{FC} or NI = compensation of employees+ operating surplus+ Mixed income of self-employed + NFIA

  = 1200+ 1820+ 700+ 20= 3740Crores

ILLUSTRATION 14

From the following data calculate (a) Gross Domestic Product at Factor Cost, and (b) Gross Domestic Product at Market price

Items	₹ in Crores
Gross national product at factor cost	61,500
Net exports	(-) 50
Compensation of employees	3000
Rent	800
Interest	900
Profit	1,300
Net indirect taxes	300
Net domestic capital formation	800
Gross domestic capital formation	900
Factor income to abroad	80

SOLUTION

(a) GDP at factor cost = NDP at factor cost + Depreciation

  = Compensation of employees+ Rent+ Interest + Profit + Mixed income+ (Gross domestic capital formation - Net domestic capital formation)

  = ₹ 3,000 + ₹ 800 + ₹ 900 + ₹ 1,300 + (₹ 900 - ₹ 800)

  = ₹ 6100 Crores

(b)   Gross Domestic Product at Market Price

= GDP at factor cost + Net Indirect taxes = ₹ 6100 + ₹ 300

= 6400 Crores

ILLUSTRATION 15

Calculate NNP_{FC}. By expenditure method with the help of following information -

Items	₹ in Crores
Private final consumption expenditure	*10*
Net Import	*20*
Public final consumption expenditure	*05*
Gross domestic fixed capital formation	*350*
Depreciation	*30*
Subsidy	*100*
Income paid to abroad	*20*
Change in stock	*30*
Net acquisition of valuables	*10*

SOLUTION

Calculation of national income by expenditure method:

GDP_{MP} = Government final consumption expenditure (Public final consumption expenditure) + Private final consumption expenditure + Gross domestic capital formation (Gross domestic fixed capital formation + change stock + Net acquisition of valuables) + Net export (Note: As net import is 20, hence, net export is -20)

= 5 +10 + [350 + 30 +10]+(- 20) = 5+10+390-20 = 385 Crores

NNP_{FC} = GDP_{MP} – Depreciation + Net factor income from abroad (Income from abroad – Income paid to abroad) – Net Indirect tax (Indirect tax – subsidies)

= 385 – 30 + [0 – 20] – [0-100] = 385 – 30 – 20 + 100 = 435 Crores.

1.5   THE SYSTEM OF REGIONAL ACCOUNTS IN INDIA

Regional accounts provide an integrated database on the innumerable transactions taking place in the regional economy and help decision making at the regional level. At present, practically all the states and union territories of India compute state income estimates and

district level estimates. State Income or Net State Domestic Product (NSDP) is a measure in monetary terms of the volume of all goods and services produced in the state within a given period of time (generally a year) accounted without duplication. Per Capita State Income is obtained by dividing the NSDP (State Income) by the midyear projected population of the state.

The state level estimates are prepared by the State Income Units of the respective State Directorates of Economics and Statistics (DESs). The Central Statistical Organisation assists the States in the preparation of these estimates by rendering advice on conceptual and methodological problems. In the preparation of state income estimates, certain activities such as railways, communications, banking and insurance and central government administration, that cut across state boundaries, and thus their economic contribution cannot be assigned to any one state directly are known as the 'Supra-regional sectors' of the economy. The estimates for these supra regional activities are compiled for the economy as a whole and allocated to the states on the basis of relevant indicators.

1.6 GDP AND WELFARE

Can the GDP of a country be taken as an index of the welfare of people in that country? There are many reasons to dispute the validity of GDP as a perfect measure of well-being. In fact, GDP measures our ability to obtain many requirements to make our life better; yet leave out many important aspects which ensure good quality of life for all. GDP measures exclude the following which are critical for the overall wellbeing of citizens.

(a) Income distributions and, therefore, GDP per capita is a completely inadequate measure of welfare. Countries may have significantly different income distributions and, consequently, different levels of overall well-being for the same level of per capita income.

(b) Quality improvements in systems and processes due to technological as well as managerial innovations which reflect true growth in output from year to year.

(c) Productions hidden from government authorities, either because those engaged in it are evading taxes or because it is illegal (drugs, gambling etc.).

(d) Nonmarket production (with a few exceptions) and Non-economic contributors to well-being for example: health of a country's citizens, education levels, political participation, or other social and political factors that may significantly affect well-being levels.

(e) The disutility of loss of leisure time. We know that, other things remaining the same, a country's GDP rises if the total hours of work increase.

(f) Economic 'bads' for example: crime, pollution, traffic congestion etc which make us worse off.

(g) The volunteer work and services rendered without remuneration undertaken in the economy, even though such work can contribute to social well-being as much as paid work.

(h) Many things that contribute to our economic welfare such as, leisure time, fairness, gender equality, security of community feeling etc.,

(i) Both positive and negative externalities which are external effects that do not form part of market transactions

(j) The distinction between production that makes us better off and production that only prevents us from becoming worse off, for e.g. defence expenditures such as on police protection. Increased expenditure on police due to increase in crimes may increase GDP but these expenses only prevent us from becoming worse off. However, no reflection is made in national income of the negative impacts of higher crime rates. As another example, automobile accidents result in production of repairs, output of medical services, insurance, and legal services all of which are production included in GDP just as any other production.

1.7 LIMITATIONS AND CHALLENGES OF NATIONAL INCOME COMPUTATION

There are innumerable limitations and challenges in the computation of national income. The task is more complex in underdeveloped and developing countries. Following are the general dilemmas in measurement of national income.

There are many conceptual difficulties related to measurement which are difficult to resolve, such as:

(a) lack of an agreed definition of national income,

(b) accurate distinction between final goods and intermediate goods,

(c) issue of transfer payments,

(d) services of durable goods,

(e) difficulty of incorporating distribution of income,

(f) valuation of a new good at constant prices, and

(g) valuation of government services

Other challenges relate to:

(a)   Inadequacy of data and lack of reliability of available data,

(b)   presence of non-monetised sector,

(c)   production for self-consumption,

(d)   absence of recording of incomes due to illiteracy and ignorance,

(e)   lack of proper occupational classification, and

(f)   accurate estimation of consumption of fixed capital

SUMMARY

♦   National income accounts are extremely useful for analyzing and evaluating the performance of an economy, knowing the composition and structure of the national income, income distribution, economic forecasting and for choosing economic policies and evaluating them.

♦   Gross domestic product (GDP $_{MP}$) is a measure of the market value of all final economic goods and services, gross of depreciation, produced within the domestic territory of a country during a given time period gross of depreciation.

♦   Capital goods (business plant and equipment purchases) and inventory investment—the net change in inventories of final goods awaiting sale or of materials used in the production are counted in GDP

♦   To eliminate the effect of prices, in addition to computing GDP in terms of current market prices, termed 'nominal GDP' or GDP at current prices, the national income accountants also calculate 'real GDP 'or GDP at constant prices which is the value of domestic product in terms of constant prices of a chosen base year.

♦   GNP $_{MP}$ = GDP $_{MP}$ + Net Factor Income from Abroad

♦   NDP $_{MP}$ = GDP $_{MP}$ - Depreciation

♦   NDP $_{MP}$ =NNP $_{MP}$ - Net Factor Income from Abroad

♦   NNP $_{MP}$ = GNP $_{MP}$ - Depreciation

♦   Market Price = Factor Cost + Net Indirect Taxes= Factor Cost + Indirect Taxes – Subsidies

♦   Gross Domestic Product at Factor Cost (GDP$_{FC}$) = GDP $_{MP}$ – Indirect Taxes + Subsidies

♦   Net Domestic Product at Factor Cost (NDP$_{FC}$)is defined asthe total factor incomes earned by the factors of production.

♦   Net National Product at Factor Cost (NNP_{FC})or National Income

    NNP_{FC} = National Income = FID (factor income earned in domestic territory) + NFIA.

♦   Personal income is a measure of the actual current income receipt of persons from all sources. Disposable Personal Income (DI) that is available for their consumption or savings DI = PI - Personal Income Taxes

♦   Circular flow of income refers to the continuous interlinked phases in circulation of production, income generation and expenditure involving different sectors of the economy.

♦   Product Method or Value Added Method is also called Industrial Origin Method or Net Output Method and entails the consolidation of the production of each industry less intermediate purchases from all other industries.

♦   Under income method, national income is calculated by summation of factor incomes paid out by all production units within the domestic territory of a country as wages and salaries, rent, interest, and profit. Transfer incomes are excluded.

♦   Under the expenditure approach, also called Income Disposal Approach, national income is the aggregate final expenditure in an economy during an accounting year composed of final consumption expenditure (private& government), gross domestic capital formation and net exports.

TEST YOUR KNOWLEDGE

Multiple Choice Type Questions

1.   *The concept of 'resident unit' involved in the definition of GDP denotes*

    (a)   *A business enterprise which belongs to a citizen of India with production units solely situated in India*

    (b)   *The unit having predominant economic interest in the economic territory of the country for one year or more irrespective of the nationality or legal status*

    (c)   *A citizen household which had been living in India during the accounting year and one whose economic interests are solely in India*

    (d)   *Households and business enterprises composed of citizens of India alone living in India during the accounting year*

2.   *Read the following statements and answer the following question.*

    I.   *Intermediate consumption consists of the value of the goods and services consumed as inputs by a process of production,*

II.   Intermediate consumption excludes fixed assets whose consumption is recorded as consumption of fixed capital.

(a)   Only I is true

(b)   Both I and II are true

(c)   Only II is true

(d)   Neither I nor II is true

3.   Gross Domestic Product (GDP) of any nation

(a)   excludes capital consumption and intermediate consumption

(b)   is inclusive of capital consumption or depreciation

(c)   is inclusive of indirect taxes but excludes subsidies

(d)   None of the above

4.   Read the following statements

I.   'Value added' refers to the difference between value of output and purchase of intermediate goods.

II.   'Value added' represents the contribution of labour and capital to the production process.

(a)   Statements I and II are incorrect

(b)   Statements I and II are correct

(c)   Statement I is correct and II is incorrect

(d)   Statement II is correct and I is incorrect

5.   Non-economic activities are

(a)   those activities whose value is excluded from national income calculation as it will involve double counting

(b)   those which produce goods and services, but since these are not exchanged in a market transaction they do not command any market value

(c)   those which do not involve production of goods and services as they are meant to provide hobbies and leisure time activities

(d)   those which result in production for self consumption and therefore not included in national income calculation

6.   Which of the following does not enter into the calculation of national income?

(a)   Exchange of previously produced goods

(b)   Exchange of second hand goods

(c)   Exchange of stocks and bonds

(d)   All the above

7.   Which of the following enters into the calculation of national income?

(a)   The value of the services that accompany the sale

(b)   Additions to inventory stocks of final goods and materials

(c)   Stocks and bonds sold during eth current year

(d)   (a) and (b) above

8.   Gross National Product at market prices GNP $_{MP}$ is

(a)   GDP $_{MP}$ + Net Factor Income from Abroad

(b)   GDP $_{MP}$ - Net Factor Income from Abroad

(c)   GDP $_{MP}$ - Depreciation

(d)   GDP $_{MP}$ + Net Indirect Taxes

9.   Choose the correct statement

(a)   GNP includes earnings of Indian corporations overseas and Indian residents working overseas; but GDP does not include these

(b) NNP_{FC} = National Income = FID (factor income earned in domestic territory) – NFIA.

(c)   Capital goods and inventory investment are excluded from computation of GDP

(d) NDP_{MP} = GDP_{MP} + Depreciation

10.   The basis of distinction between market price and factor cost is

(a)   net factor income from abroad

(b)   net indirect taxes (i.e., Indirect taxes - Subsidies)

(c)   net indirect taxes (i.e., Indirect taxes + Subsidies)

(d)   depreciation (consumption of fixed capital)

11.   If net factor income from abroad is positive, then

(a)   national income will be greater than domestic factor incomes.

(b)   national income will be less than domestic factor incomes.

(c)   net exports will be negative

(d)   domestic factor incomes will be greater than national income

12.   The GDP per capita is

(a)   a measure of a country's economic output per person

(b)   actual current income receipts of persons

(c)   national income divided by population

(d)   (a)and (c) above

13.   Which of the following is an example of transfer payment?

(a)   Old age pensions and family pensions

(b)   Scholarships given to deserving diligent students.

(c)   Compensation given for loss of property due to floods

(d)   All the above

14.   Mixed income of the self -employed means

(a)   net profits received by self -employed people

(b)   outside wages received by self- employed people

(c)   combined factor payments which are not distinguishable,

(d)   wages due to non- economic activities

15.   Which of the following is added to national income while calculating personal income?

(a)   Transfer payments to individuals

(b)   Undistributed profits of corporate

(c)   Transfer payments made to foreigners

(d)   Mixed income of self employed

ANSWERS

1.	**(b)**	2.	**(b)**	3.	**(b)**	4.	**(b)**	5.	**(b)**
6.	**(d)**	7.	**(d)**	8.	**(a)**	9.	**(a)**	10.	**(b)**
11.	**(a)**	12.	**(d)**	13.	**(d)**	14.	**(c)**	15.	**(a)**