Unit IV

Syllabus

1. Overview of Macroeconomics
2. Basic concepts of National Income Accounting
3. Introduction to Business Cycle
4. Inflation-causes, consequences, and remedies: Monetary and Fiscal policy.

Note: The text in blue is for your understanding only. You may or may not use it in your answers. The text in red might be asked in exams but the chances are less.

Overview of Macroeconomics

Macroeconomic policy or macroeconomics has the following:

Objectives

Output:
High level and rapid growth of output

Employment:
High level of employment with low involuntary unemployment

Stable prices

Instruments

Monetary policy:
Buying and selling bonds, regulating financial institutions

Fiscal policy:
Government expenditures
Taxation

The goals of macroeconomic policy are:

1) A high and growing level of national output
2) High employment with low unemployment
3) A stable or gently rising price level

The most comprehensive measure of the total output in an economy is the **gross domestic product (GDP)**. GDP is the measure of the market value of all final goods and services—food grains, soft drinks, cars, rock concerts, donkey rides, and so on—produced in a country during a year. Real GDP (discussed below) is the most closely watched measure of output; it serves as the carefully monitored pulse of a nation's economy.

$$\%\ \text{growth rate of real GDP in year } t = 100 \times \frac{\text{GDP}_t - \text{GDP}_{t-1}}{\text{GDP}_{t-1}}$$

Despite the short-term fluctuations seen in business cycles, successful economies exhibit a steady long-term growth in real GDP and an improvement in living standards; this process is known as **economic growth.**

Potential GDP represents the maximum sustainable level of output that the economy can produce. When an economy is operating at its potential, there are high levels of utilization of the labor force and the capital stock. When output rises above potential output, inflation tends to rise, while a below-potential level of output leads to high unemployment. Potential output is determined by the economy's productive capacity, which depends upon the inputs available (capital, labor, land, etc.) and the economy's technological efficiency. Potential GDP tends to grow steadily because inputs like labor and capital and the level of technology change quite slowly over time. By contrast, actual GDP is subject to large business-cycle swings.

A **recession** is a period of significant decline in total output, income, and employment, usually lasting more than a few months and marked by widespread contractions in many sectors of the economy. A severe and prolonged downturn is called a **depression**. Output can be temporarily above its potential during booms and wartime as capacity limits are strained, but the high utilization rates may bring rising inflation and are usually ended by monetary or fiscal policy.

Of all the macroeconomic indicators, employment and unemployment are most directly felt by individuals. People want to be able to get high-paying jobs without searching or waiting too long, and they want to have job security and good benefits. The **unemployment rate** is the percentage of the labor force that is unemployed. The labor force includes all employed persons and those unemployed individuals who are seeking jobs. It excludes those without work who

are not looking for jobs. The unemployment rate tends to reflect the state of the business cycle: when output is falling, the demand for labor falls and the unemployment rate rises.

The third macroeconomic objective is price stability. This is defined as a low and stable inflation rate. To track prices, government statisticians construct price indexes, or measures of the overall price level. An important example is the consumer price index (CPI), which measures the trend in the average price of goods and services bought by consumers. Overall price level is denoted by the letter P. Economists measure price stability by looking at inflation, or the rate of inflation. The **inflation rate** is the percentage change in the overall level of prices from one year to the next.

$$\text{Rate of inflation in year } t = 100 \times \frac{P_t - P_{t-1}}{P_{t-1}}$$

A **deflation** occurs when prices decline (which means that the rate of inflation is negative). At the other extreme is a **hyperinflation**, a rise in the price level of a thousand or a million percent a year. Under hyperinflation, prices are virtually meaningless and the price system breaks down. Price stability is important because a smoothly functioning market system requires that prices accurately convey information about relative scarcities. History has shown that high inflation imposes many costs—some visible and some hidden—on an economy. With high inflation, taxes become highly variable, the real values of people's pensions are eroded, and people spend real resources to avoid depreciating money. But declining prices (deflation) are also costly. Hence, most nations seek the optimal slowly rising prices as the best way of encouraging the price system to function efficiently.

Governments have certain **instruments** that they can use to affect macroeconomic activity. A nation has two major kinds of policies that can be used to pursue its macroeconomic goals—fiscal policy and monetary policy.

1) **Fiscal policy** consists of government expenditure and taxation. Government expenditure influences the relative size of total spending and private consumption. Taxation subtracts from incomes, reduces private spending, and affects private saving. In addition, it affects investment and potential output. Fiscal policy is primarily used to affect long-term economic growth through its impact on national saving and investment; it is also used to stimulate spending in deep or sharp recessions.
2) **Monetary policy**, conducted by the central bank, determines short-run interest rates. It thereby affects credit conditions, including asset prices such as stock and bond prices and exchange rates. Changes in interest rates, along with other financial conditions, affect spending in sectors such as business investment, housing, and foreign trade. Monetary policy has an important effect on both actual GDP and potential GDP.

The current and the future macroeconomic indicators of the country are very important input for all kinds of business decisions. The business environment of the country is assessed based on the following factors:

1) **Current and future trend in GDP/GNP**

   High sustainable growth in GDP/GNP offers a promising sales prospect for all kinds of modern goods and services and, therefore, a good business environment. On the contrary, low growth rate or decline in GDP reduces business prospects.

2) **Current and future trend in per capita GDP/GNP**

   A high growth in per capita income and an expanding middle class offers profitable opportunities to the sellers of high-end luxury products like Tesla cars, expansive Cafes, foreign apparel brands etc.

3) **Trend in the aggregate demand for consumer and capital goods**

   Increasing demand for consumer and capital goods indicates expansion in the economy and a good business prospect. While stagnated or declining aggregate demand, even with increasing GDP, reduces business prospects.

4) **Trend in the rate of savings and investment**

   Rising rate of total savings indicates high availability of business finance and investible funds. Low rate of savings creates financial scarcity leading to rise in the interest rate. Rising interest rate is a big constraint on the business prospect in the country. Note that even a low rate of interest in a country facing recession fails to promote the business prospect and, therefore, investment. New investors get encouraged after looking to high rate of investments by incumbent firms as that signals a growth outlook.

5) **General price level and expected future trends of inflation**

   The general level of price in a country may show three kinds of trends:

   i. rising at a high rate resulting in inflation
   ii. declining rapidly showing deflation, and
   iii. remaining stable, may be with minor fluctuations.

   Both inflation and deflation at high rates affect business prospects adversely. A low or moderate rate of inflation provide a good business environment and business prospects.

6) **Level of employment and its likely trend**

   Although not directly but the trend in overall employment has serious indirect implication for business management. Growing employment indicates not only a better social environment in the country but also a better business prospect. This is because the rise in employment shows rise in wage incomes which leads to increase in demand for consumer goods, as a major part of wage incomes is spent on consumer goods and services. Rising unemployment reduces demand for consumer goods, on the one hand, and creates social problems and social crimes like kidnapping of businessmen for ransom, on the other, which affect business environment of the country adversely.

7) Wage rate trends

A rapidly growing real wage rate may affect profitability of the exporters due to higher costs of production. Usually, MNCs who wish to supply globally hunt for low wage countries to set up their business.

8) International aspects of the economy

In today's globalized world, import of inputs and exports of output, capital inflows and outflows and international flows of skilled labor are important part of domestic business. The tariff structure of a country, the expected movements in the currency exchange rate as well as the international political relations form important parameters on which businesses make their decisions.

9) Government's macroeconomic policies

Monetary and fiscal policy also play a very important role in creating a favorable or an unfavorable business environment in the country. For example, an expansionary monetary policy indicated by lower rate of interest and easy availability of funds promotes business environment. Similarly, the fiscal policy (i.e., government's taxation and expenditure policy) can be devised to meet the need of the country to control its business cycle through increasing spending and cutting taxation, high inflation, and deflation, restructuring of industrial sector away from agricultural to modern industry etc. Business rating agencies also look for a healthy budget deficit in a country to gauge the health of an economy.

National Income Accounting

Following are the various aggregates calculated by national income accounts:

1. **Gross Domestic Product (GDP)**

   The gross domestic product (GDP) is the most comprehensive measure of a value of nation's total output of final goods and services produced within the domestic territory of a country. Due to the circular flow of income, GDP can be measured using three different approaches:

   a. Product method or Value-added method
   b. Expenditure method
   c. Factor income method

   All three methods should give the same answer because all the revenue earned from selling the output is distributed among factors as payments which they spend on either consumption goods or capital goods (through saving and investments). We will discuss these below.

   GDP at market price = GDP at factor cost + Net indirect taxes

   Here Net indirect taxes (NIT) = Indirect taxes – subsidies. Indirect taxes are taxes on production and sales like GST while direct taxes are taxes on income.

2. **Gross National Product (GNP)**

   While GDP measures the economic activity within the domestic territory, irrespective of whether the factors of production are owned by residents or nonresidents of a country, the GNP measures the total final output produced with inputs owned by the residents (resident could be a foreigner continuously residing in the country for more than 6 months) of a country during a year, irrespective of whether production takes place domestically or abroad.

   GNP at market price = GNP at market price + net factor income from abroad (NFIA)

3. **Net Domestic Product (NDP)**

   NDP is just GDP minus depreciation of capital employed in the domestic economy.

4. **Net National Product (NNP)**

   NNP is just NDP minus depreciation of capital owned by residents of a country. It is also called the NNP at market price.

5. **National Income (NI) or NNP at factor cost**

   NNP at factor cost = NNP at market prices – Net Indirect taxes

6. **Personal Income (PI)**

   NI – (Undistributed company profits + Net interest payments made by households + Corporate tax) + Transfer payments to the households from the government and firms.

   Transfer payments to households are subsidies like on power, food grains, cooking gas etc., insurance benefits, unemployment benefits and old age pensions etc.

7. **Personal Disposable Income (PDI)**

   PI = PDI – Personal Income taxes – Non tax payments

   It is this personal disposable income that is available to households for consumption or saving.

8. **Private Income**

   Total Private Income = Net Domestic Product – Public Income

   where income accruing to the public sector is called public income.

Three methods of measuring GDP (of a country in a year)

1. Product method or Value-added method
   There are again two ways to calculate GDP by this method.
   a. One is to calculate the market value $\sum_i p_i \times q_i$ of all final goods and services produced in a country in a given year. By final goods and services, we mean any goods and services which are not intermediary input in the production or distribution of something else. For example, the value of a hard disk being added to a laptop will not be counted while the value of a replacement hard disk being

sold to a student will be counted if the student is not going to assemble any laptop and sell it. The idea is that the final product of laptop already includes the cost (and therefore value) of the hard disk in the assembly.

b. Another method is to add the value-added part in the production of any good or services, whether final or not. This way we get around the problem of double counting the value of an intermediate good twice, in its own value and again as a part of the value of the final good.

$$\sum_i VA_i$$

Here value added (VA) of any product is the $(p \times q)$ – cost of intermediary goods that are used up in production. For example, production of a cake would require flour, eggs, sugar, cherries, cream, paper etc.

2. Factor income method
   Factors (land, labor, capital, and entrepreneurship) employed in the production are paid in the form of payments (rent, wages and salaries, interest payment and profits). The sum of the payments to all the factors employed in the domestic territory + depreciation measures the GDP at factor cost.
3. Expenditure method
   It is the expenditure by domestic households, firms, government, and foreigners on the domestic produce of a country that becomes the earning of the firms and payments of the factors.

GDP at market prices = C + I + G + X – M

Where **C** is the consumption expenditure by domestic households, **I** is the investment expenditure by firms located in the domestic territory, **G** is the expenditure by the government on purchase of various goods and services produced domestically, **X** is the demand for domestically produced goods and services by foreigners (also called exports), and **M** is the imports.

Business Cycles

As the name suggests, it is a cyclical behavior (like the sine function) of business (or economic) activity. Since an economy saves (and invests) some part of its national output or income, its resources (or capacity) of production increase over time, leading to a growth in its national output (or income). If an economy uses all its resources (labor, capital, and technology) "fully" as well as "efficiently" then it is said to be working at its **potential**.

An economy is said to reach its **potential rate of growth** if it utilizes all its growing resources fully and efficiently. The economy follows a **steady growth path** or trend if over time it grows at its potential rate of growth. The problem with economic activity is that it does not always grow stably or steadily along the potential growth path. The economic growth rate usually fluctuates above or below its steady growth path and these fluctuations or ups and down of business activity take the form of cycles of prosperity and depression.

For example, if an economy is saving and investing 30% of its national output then next year its capital stock should go up by 30% and without any shortage of labor and constant returns to scale, its national output should also grow by 30%. This 30% rate of growth in national output will be called its potential rate of growth. However, it might be the case that even though people save 30% of their income but investors do not invest enough and so capital stock and therefore national output grows at much less than 30%. Moreover, even when the investment equals savings, the entire capital stock might not be used fully at its potential because of lack of demand for produce. So even when the economy should have grown by 30%, it fails to. It might also happen that while capital stock grows only at 30% (with maximum possible investment) but output grows at even more than 30%. This will happen if resources are over utilized i.e. workers and machines are employed overtime because of very high demand for produce.

A **business cycle** refers to a period of high growth and prosperity in the economy followed by a period of sharp economic slowdown and depression. During the period of prosperity, there is a high growth rate of national output (or income) above the potential growth rate. Moreover, there is high growth rate of investment, employment along with a reasonably high inflation rate. On the other hand, during the period of recession and depression, growth rate of national output, investment, and employment declines sharply. During the depression, the growth rate of national income becomes negative; business activities decline sharply; unemployment rises to high levels; and price level goes down resulting in deflation. In short, a periodic **recurrence** of high growth followed recession makes the business cycle.

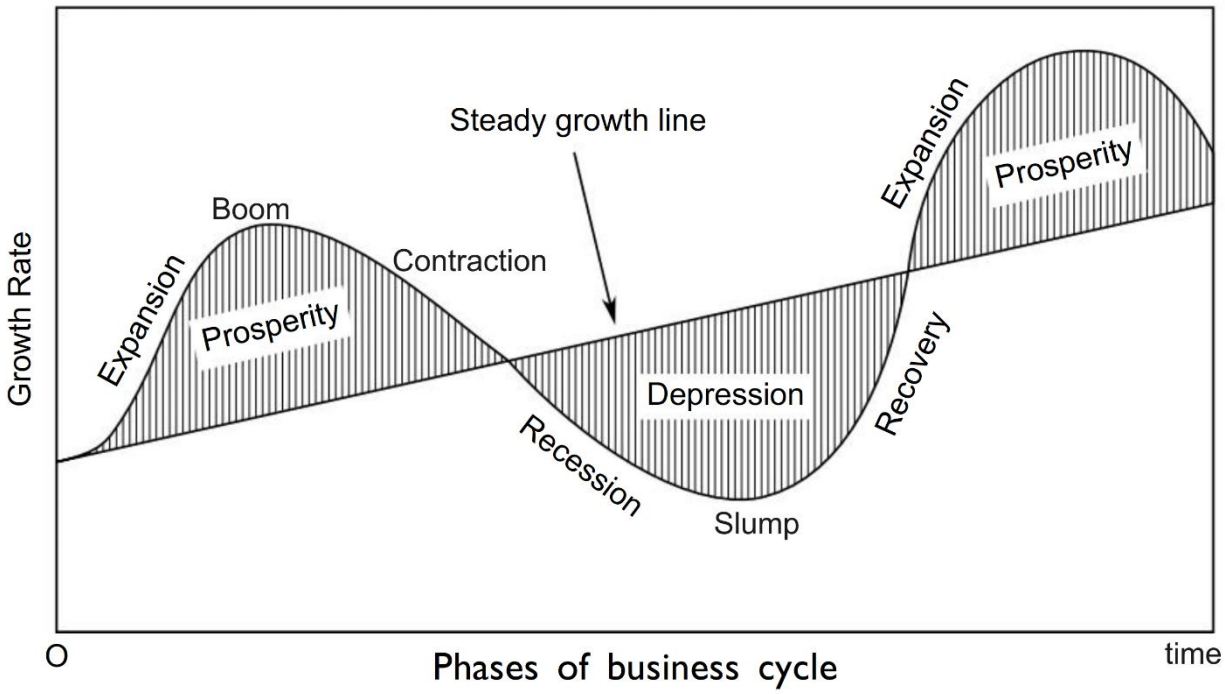

Figure 1

A business cycle includes the following phases:

1. **Expansion**
   The expansion phase begins with some positive shock (usually due to monetary stimulus, fiscal stimulus, or external shocks like fall in oil prices etc.) providing impulse to some relatively more shock-sensitive sector (or industry). This initial impulse then spreads to other sectors of the economy. This phase of business cycle is characterized by above average non-sustainable rates of growth in the national output, incomes, and aggregate demand. There is a rise in labor employment. investment rate, sales, profits, price level, bank credit, wages, share market and positive economic sentiment. All these are features of high levels of economic activity that in turn causes wages and the interest rates to become very high, as the economy approaches full employment of labor and full use of its capacity i.e. capital.
2. **Peak of prosperity or boom**
   The expansion phase is brought to a halt when the economy achieves full employment of labor, rise in wages, high interest rates, and excess capacity formation. All these lead to low profits and investments. Moreover, a contractionary monetary and fiscal policy of the government or some external shock like oil price increase, recession in major importer country or war may also cause a downward turn.
3. **Contraction**

Beyond the peak level, the growth rate of the over-heated economy starts sliding down in the contraction phase. The aggregate demand keeps falling due to fall in investments and consumption.

4. **Recession**
   The contraction of economic activity does not stop once the economic activity has reached its potential level. By this time the sentiment or expectations about future become sufficiently negative to make the economy go into recession, a term used for a slowing economy below its potential. Workers lose their jobs, investments are postponed, banks are not able to lend, interest rates and wages begin to fall, share prices, profits, sales, general price level, incomes, and aggregate demand is all falling in this stage. When the recession turns acute enough then it is often termed as depression. Some people call the entire recessionary period, a period of depression as you can see in the figure 1.
5. **Trough of depression or slump**
   Since bad days are not permanent, the recession hits its minimum or turning around point known as slump or trough. The use of expansionary monetary and fiscal policy, positive external shocks and technological breakthroughs cause the decrease in growth rate to reach its minimum and the economy turns around. The growth rate at trough might be negative and it is the most severe phase for the economy which causes large scale distress and hardships for the masses.
6. **Recovery**
   A resurgence of investment and profits begins in a particular sector and spreads across to the entire economy. The phase of revival of economic activity, employment, aggregate demand, investments, output, and incomes is known as the recovery phase. The growth rates begin to rise again back to its potential level. Things are looking positive once again.

Theories that explain business cycles can be divided into:

1. Mainstream theories
   These theories offer demand side explanations to business cycles. While these theories do not rule out the role of supply shocks (like energy price shocks, wars, and natural disasters etc.) in causing fluctuations in economic activity, their main explanation of the fluctuations in economic activity is the fluctuations in aggregate demand. There theories can mainly be further divided into:
   a. Keynesian
      According to them, the fluctuations in aggregate demand trigger mainly due to fluctuations in business confidence that affects investment decisions (a major component of aggregate demand). Their remedy to get out of depression is

mainly the fiscal policy intervention by the government in the form of increased government spending in order to boost aggregate demand.

b. Monetarists

According to them, it is fluctuations in the growth rate of the quantity of money that causes the fluctuations in consumption spending and investment (two major components of aggregate demand). Their remedy to get out of depression is mainly the monetary policy intervention by the government in the form of increased money supply or reduced interest rates.

2. Real business cycle theory

According to them, the main source of economic fluctuations are random fluctuations in productivity that result mainly from fluctuations in the pace of technological change but sometimes also from external shocks. A period of rapid productivity growth brings a business cycle expansion, and a slowdown or fall in productivity triggers a recession. Although all technological change eventually increases productivity, but sometimes a new technological change might make a sufficient amount of existing capital (especially human capital) obsolete, leading to a temporarily fall in productivity and profits. At such a time, more jobs are destroyed than created and more businesses fail than start up.

Inflation

There are many good and services produced and consumed in an economy, each having different prices ranging from few hundred rupees per unit to crores of rupees per unit. The general price level (denoted by capital P) in an economy is some sort of average price of these various goods and services. One possible method to calculate the general price level is to find the simple average of price per unit of all goods and services being produced and bought. But all goods and services should not be given equal importance in the calculation of general price level since some of them are bought by very few people and not meant for general consumption. Therefore, a better measure of general price level is a weighted average of price of various goods and services. The weights taken are according to their share in consumption by the population.

Following measures to calculate the general price level are often used:

1. One measure of general price level is **consumer price index (CPI)** which is the ratio of weightage average of a given basket of goods and services (normally consumed by majority of households) at current prices, to the weightage average (with same weights) of the same basket of goods and services at some base year prices.
   Suppose the baskets contains three goods G1, G2, G3 and two services S1, S2. And suppose their weights are taken to be 0.3,0.2,0.3,0.1,0.1 respectively. Let the prices were respectively 100, 200, 300, 100 and 300 per unit in the base year say 2020. And let the current year 2024 prices are 400, 300, 200, 200 and 400 per unit respectively. CPI in 2024 will be 120+60+60+20+40 / 30+40+90+10+30 =1.5. This means that the general price in 2024 is 150% of what it was in 2020.
2. Another measure of general price level is the **wholesale price index (WPI)**. In this index, the basket of the goods and services only includes wholesale goods which are normally traded between corporations (producers).
3. A measure which considers all the goods and services being bought (or produced) in an economy is known as **GNP (or GDP) Deflator**. The value of GNP (or GDP) deflator in the current year is the ratio of GNP (or GDP) calculated at current prices (known as nominal GNP (GDP)) to the GNP (or GDP) calculated at base year prices (known as real GNP (or GDP)).

   $$\text{GNP (or GDP) Deflator in year } t = \frac{\sum_{i=1}^{n} p_t^i q_t^i}{\sum_{i=1}^{n} p_0^i q_t^i} = \frac{\text{nominal national output}}{\text{real national output}}$$

   Note that current period quantities of the n goods and services are same in both the numerator and denominator but the prices are different.

Even with the same base year these measures usually give different values for the general price level in a period. Base year prices are also known as constant prices.

Inflation occurs when the general level of prices is rising. The rate of inflation in any period is defined as the percentage change in the general price level:

$$\text{Rate of inflation in year } t = \left(\frac{P_t - P_{t-1}}{P_{t-1}} \right) \times 100\%$$

Inflation always means a positive value of the rate of inflation.

If the rate of inflation is negative then the phenomena is known as **deflation**. When the rate of inflation is positive but declines in value over time, then the phenomena is known as **disinflation**.

Types of inflation based on how high is the rate of inflation:

1. **Low Inflation.**
   Low inflation is when prices rise slowly and predictably. Single-digit annual inflation rates are usually referred to as low inflation. When prices are relatively stable, people trust money because it retains its value year on year. People are willing to write long-term contracts in money terms because they are confident that the relative prices of goods they buy and sell will not get too far out of line.
2. **Galloping Inflation.**
   Inflation in the double-digit or triple-digit range of 20, 100, or 200 percent per year is called galloping inflation or "very high inflation." Galloping inflation is relatively common in countries suffering from weak governments, war, or civil wars. Once galloping inflation becomes established, serious economic problems arise. Generally, most contracts get indexed to a stable foreign currency like the dollar. In these conditions, money loses its value very quickly, so people hold only the bare-minimum amount of money needed for daily transactions. Financial markets wither away, as capital flees abroad. People hoard goods, buy houses, and never, ever lend money at low nominal interest rates.
3. **Hyperinflation**.
   A third and deadly form of inflation is hyperinflation or a stupendously high inflation. Prices are rising at a million or even a trillion percent per year. People were seen running from store to store, dumping their money before the money loses all its value tomorrow. Relative prices become highly unstable. Normally, a person's real wages (money wage divided by price level) fluctuate not more than one percent from month to month. But during hyperinflation, real wages may change on average one-third (up or down) each month. This huge variation in relative prices and real wages (and the inequities and distortions caused by these fluctuations) take enormous toll on workers and businesses, highlighting one of the major costs of inflation.

Economic consequences of Inflation

1. The major impact of inflation is *redistribution of income and wealth* among different groups. This happens because a high inflation reduces the real value of people's wealth. While anticipated inflation can be taken into account while making contracts and deals, it is the unanticipated inflation that redistributes wealth from creditors to debtors, helping borrowers and hurting lenders.
2. Inflation hurts economic efficiency and national output. This happens because high inflation distorts relative prices and therefore price signals cannot be used for making efficient economic decisions by businesses and households. Distortion in relative prices not only affects the outputs of different goods but sometimes the national output and employment.
3. Money is no longer considered a good store of value. People hold little cash, visit bank more often, consume real resources like gold and property just to protect the value of their wealth.
4. Since firms must change the prices of their products frequently considering high inflation, they incur the "menu cost" of deciding new prices and printing new menus, catalogues, and price tags etc.
5. It has observed from historical data that growth rates are high in countries with low inflation while countries with high inflation or deflation have low growth rates. Hence, low inflation is necessary for economic growth but too much or no inflation is undesirable.

In your answer to consequences or features of inflation, you may discuss galloping and hyperinflation.

Before we discuss causes of inflation, a few concepts are needed.

Nominal GDP in any year means the value of national output produced calculated at that year prices. **Real** GDP means the value of national output calculated at some base year prices. The base year is usually in the past. The price level (given by GDP deflator) in the base year is always 1 or 100 (when multiplied by 100%) by definition. Nominal GDP in any year is therefore equal to the real GDP in that year multiplied by the price level in that year. In other words, real GDP in any year is equal to the nominal GDP in that year divided by the price level in that year.

We can also define real and nominal interest rates. Nominal interest rate in any year is the rate of interest (assuming there is only one such rate) provided by banks to their depositors in that year. Real interest rate is the nominal interest rate minus the expected rate of inflation. So, if I am getting this year 10% rate of interest per annum return from my bank deposit but the prices have gone up by 6% during the year due to inflation, my real earnings are just 4%. Real interest rate is denoted by r and nominal interest rate by i. If the expected rate of inflation is denoted by π^e then

$$r = i - \pi^e$$

Suppose the expected rate of inflation is constant at 4% per annum by the nominal interest rate changes from 8% to 10% per annum then the real interest rate will change from 4% to 6%. Note that the change in real interest rate is same as the change in nominal interest rate.

We can also define nominal and real money. Nominal money is just the printed value of the money but real value of that nominal money is its purchasing power at any point of time. It is nominal money divided by the price level at that time. Think about how valuable will one lakh rupees of today will be in 2050.

Likewise, we may define nominal (money) and real wages. Nominal wages are the wages denominated in money terms but real wages are its purchasing power. Real wages are nominal wages divided by price level. You should not be happy if you get today's salary 20 years from now. This is because prices keep on rising.

In macroeconomics, the time horizon is divided into short-run, long-run and very long-run. Every economy at a point of time has some productive capacity available in the form of technology, capital, and labor. Therefore, the economy can produce some maximum level of output (of various goods and services) without either over-using or under-using its available resources. This output is known as the potential output or full employment level of output. Over-using means making workers overtime or using machines so much that they depreciate faster. One thing to note is that even at full employment, there is some 5% unemployment of labor which is normally due to people switching between jobs.

Suppose for example there is a sudden surge in aggregate demand (overall demand for various goods and services) in the economy. In the short run, the available resources can be stretched or over-used and the output can be more than the potential. However, the economy cannot remain over stretched or under employed forever and in the long run the use of resources and the output level must come back at its potential level. Short run is a period over which the aggregate supply or output can be more than the potential or full employment output. Long run is a period over which the aggregate supply or output is always equal to the potential or full employment output. Very long run is a period when the potential output of an economy increases due to improvement in technology or increase in availability of labor force due to population rise or increase in capital stock due to investments.

In microeconomics, we talked about market equilibrium in which a negatively sloped demand curve and positively sloped supply curve were intersecting and an equilibrium price and an equilibrium quantity (demanded and supplied) was determined. We can extend this equilibrium analysis to macroeconomics as well.

Just like demand in a market, we have aggregate demand (also called aggregate spending) at the level of economy. The aggregate demand comprises of consumption demand by households, investment demand by firms, government spending on various goods and services, and demand

coming from the rest of the world known as export demand. This aggregate demand (AD) is also a downward sloping function of price level. Look at the figure 2.

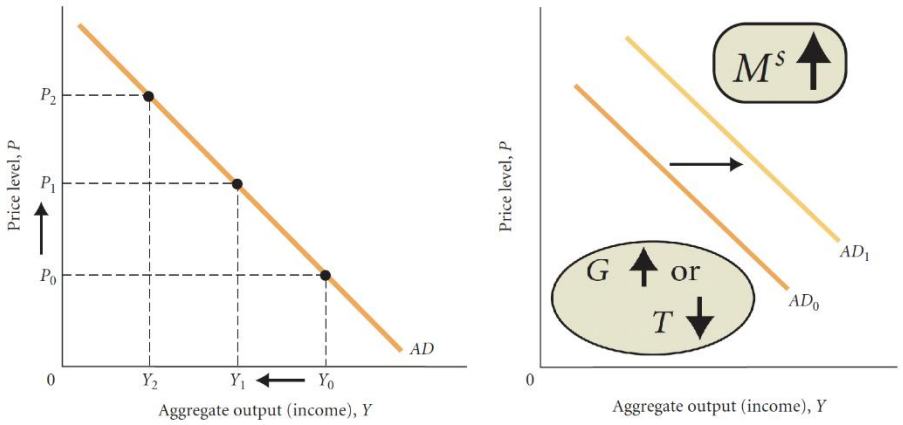

Figure 2

Just like supply in a market, we have a short run aggregate supply (also called aggregate output) at the level of economy. This short run aggregate supply (SAS) is an upward sloping function of price level. It means that the profit maximizing firms are willing to produce and supply more if the prices for their produce goes up. However, the curve assumes that the nominal or money wages remain unchanged while price of output goes up, bringing the real cost of production down. When the output is much above the potential then unemployment rates are too low and consequently money wages eventually increase because of labor shortage.

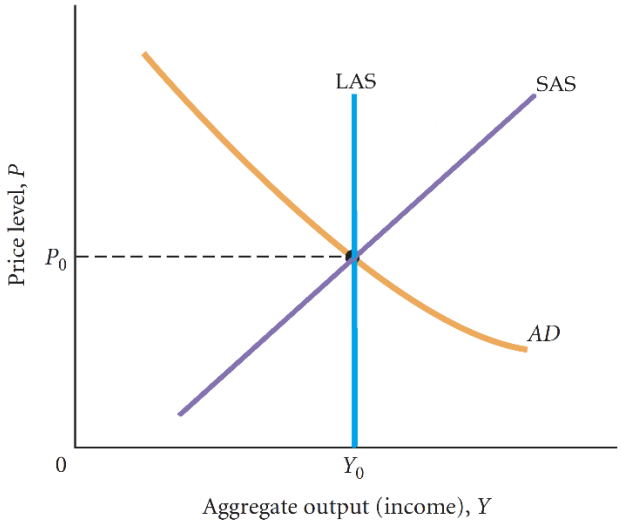

Figure 3

If the money wages increased as much as the price level then the real wages (i.e. money wage divided by the price level) will remain unchanged and hence the real cost of production will be

unchanged. The producers will not supply more than the potential output Y_0 in the long run even after the increase in price level. Hence the long run aggregate supply (LAS) will be vertical, having same output at every price level. While nominal wages are constant along a short run aggregate supply curve, real wages are constant along a long run supply curve, i.e. as price level goes up, money wages rise by same proportion.

The point of intersection of AD with the relevant aggregate supply is known as macroeconomic equilibrium. See figure 3. The output in equilibrium is known as equilibrium output and the price level is known as equilibrium price level.

Last thing is that we need money for all our transactions. Nominal aggregate demand and nominal aggregate supply are in units of money. Since demand is expressed in unit of money, the economy needs to have money to make demand. You may call this nominal money demanded or demand for nominal money or demand money. Money usually takes the form of bank notes. These notes are printed by our central bank (known as RBI). Hence RBI supplies money to meet its demand. We can think of a market for money in which people demand nominal money balances and RBI supplies nominal money balances. But what is the price of money in this market? It is the nominal interest rate which is put on the vertical axis in the figure 4. The more the nominal interest rate, the less the demand for nominal money because people find it more profitable to save than consume if banks or other financial assets are giving higher returns. The money demand curve is downward sloping. The nominal money supply however is independent of interest rate and therefore money supply curve is drawn vertical.

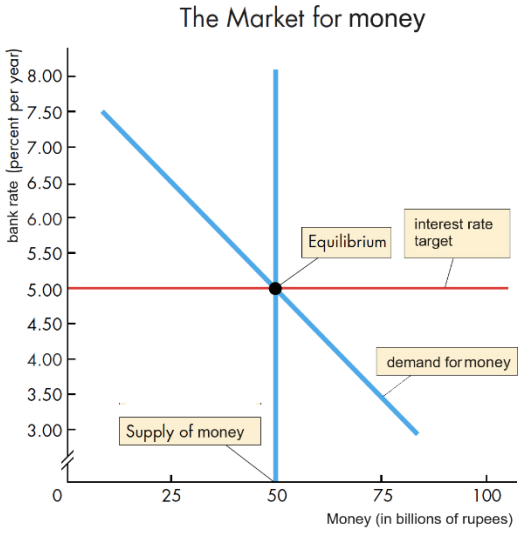

Figure 4

Given the demand curve for money, the RBI needs to supply 50 billion rupees in money if it wants to set the nominal bank rate of interest at 5% per year. If it wants to set a higher (lower) interest rate then it needs to supply less (more) of money. Changing the supply of money to set

the interest rate is called monetary policy. IF RBI increases the money supply and hence lowers the nominal interest rate then it is known as **expansionary** monetary policy. This policy stimulates aggregate demand because it is now cheaper to get loans for investments and consumption. Look at figure 4, where AD curve shifts to the right due to increase in money supply (M^s). If RBI decreases or tightens the money supply thereby increasing the nominal interest rate then investment and consumption spending decreases and the policy is called **contractionary** monetary policy. The latter policy is often undertaken to control the high inflation in the economy.

The government has a policy tool known as fiscal policy. Government's earns taxes and it spends on buying various kinds of goods and services including the fighter aircraft, laptops for government run schools, medicines for Mohalla clinics, salaries of government employees, subsidies etc. The difference between its earning and spending is known as budget deficit. Usually, it is negative because governments end up spending more than they earn. This deficit is financed by borrowings. When the government increases (in magnitude) its budget deficit by either increasing spending (G) or reducing taxes (T) then it stimulates aggregate demand (because its own spending is a part of aggregate demand and if taxes are reduced then firms and households have more disposable income to spend). Look in figure 4 that AD shifts to the right either because G goes up or T goes down. Such a policy is known as **expansionary** fiscal policy as it expands or shifts outside the aggregate demand. When the government decreases (in magnitude) its budget deficit by cutting down its spending or increasing taxes then the fiscal policy decreases aggregate demand and the policy is called **contractionary**.

Causes of inflation:

1. ***In the long run, inflation is just a monetary phenomenon.*** It occurs if the quantity of money grows faster than the growth of potential GDP. If central bank increases its nominal money supply, then the nominal interest rate will fall in the money market. This will lead to increased investment and consumption spending financed by borrowings. Aggregate demand curve will shift to the right as shown in Figure 2. As discussed below, the real output will increase in the short run but only price level will increase in the long run by as much percentage as the increase in nominal money supply. It is the rate of growth of money supply that determines the long run rate of inflation.
2. *There is also a role of expectations about inflation in causing inflation.* Inflation has a high degree of inertia in a modern economy. People form an adaptive (based on what they experienced recently) expectation of the rate of inflation, and that rate is accounted for in their labor contracts and other deals. Therefore, the expectation of inflation leads to actual inflation. In other words, **inflation is realized because expected.**
3. ***In the short run however, the actual rate of inflation may turn out to be more or less than anticipated owing to unanticipated shocks in aggregate demand or aggregate supply.*** The economy is constantly facing shocks like changes in aggregate demand,

sharp oil and commodity price movements, poor agricultural harvests, movements in the foreign exchange rate, productivity changes, and countless other economic events that push inflation away from its expected rate. These shocks can be divided broadly into aggregate demand or aggregate supply shocks.

a. Demand-Pull inflation

An inflation that starts because aggregate demand increases is called a **demand-pull inflation**. Demand-pull inflation can be triggered by any of the factors (other than price level) that changes aggregate demand. For example, an interest rate cut by the central bank, an increase in the quantity of money supply, an increase in government expenditure, a tax cut by the government, an increase in exports, or an increase in investment stimulated by an increase in expected future profits etc. Such increase in aggregate demand pulls the general prices up. This process

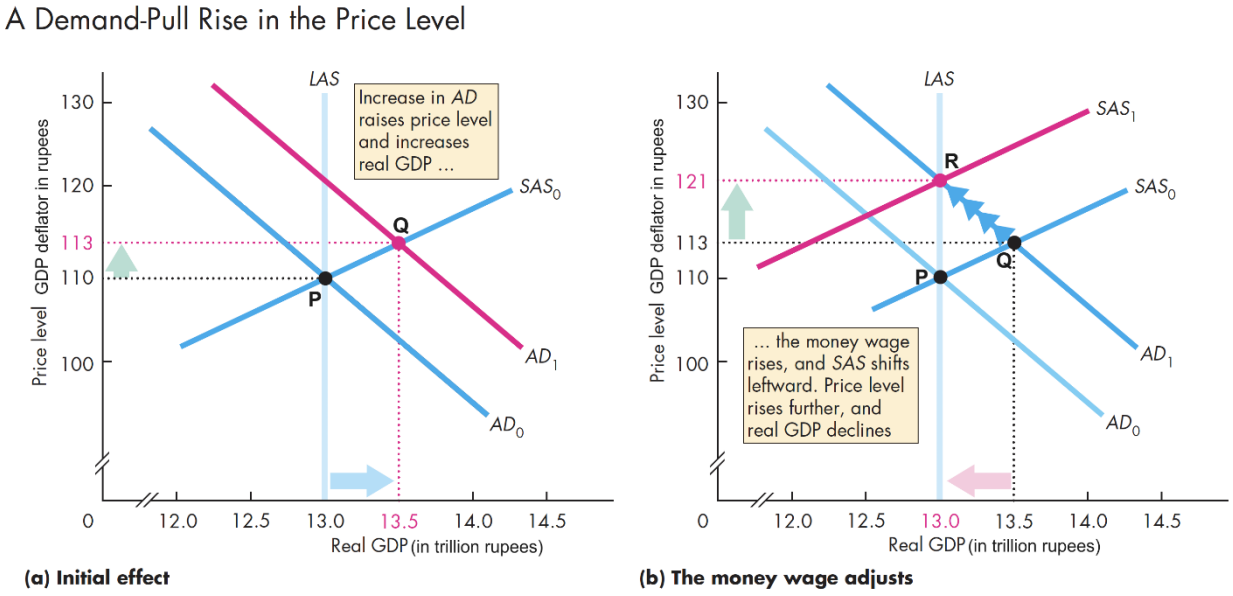

Figure 5

is shown in figure 5. Here is a downward sloping real aggregate demand curve AD. For a given nominal wage rate, the short run real aggregate supply curve SAS_0 is an upward sloping curve.

Suppose the economy is in equilibrium at its potential level at point P where **real** aggregate demand = aggregate supply = 13 trillion rupees at the price level of

110 rupees. As the aggregate demand increase at the same price because of a demand shock, the aggregate demand shifts from AD_0 to AD_1. The economic equilibrium moves along its short run supply curve SAS_0 reaching point Q, where the real GDP moves up to 13.5 trillion rupees and price level goes up to 113. The firms can produce and sell more at higher prices in the short run because the economy always has around 5% unemployment of labor (because people are switching between jobs) even at full employment of labor plus some inventories as well as excess capacity of machines being kept specifically to meet sudden demand shocks. Hence the initial impact of a demand shock is the increase in aggregate output as well as price level but fall in real wages. This is because money wages are same but prices of goods and services have gone up.

But real GDP cannot remain above its potential level forever. As real wages recover to their earlier level following labor shortages and workers asking more money wages, the short-run aggregate supply decreases at any given price and the SAS curve starts to shift leftward. The price level rises further. This process ends when the short-run aggregate supply curve has shifted backwards from SAS_0 to SAS_1 in the RHS figure. At that time, the economy (or economic equilibrium) is at point R with increased price level of 121 rupees. The real GDP has returned to potential real GDP of 13 trillion rupees, the level at which it started. Hence while a demand shock leads to increase in real output in the short run, it only leads to rise in price level in the long run.

A Demand-Pull Rise in the Price Level

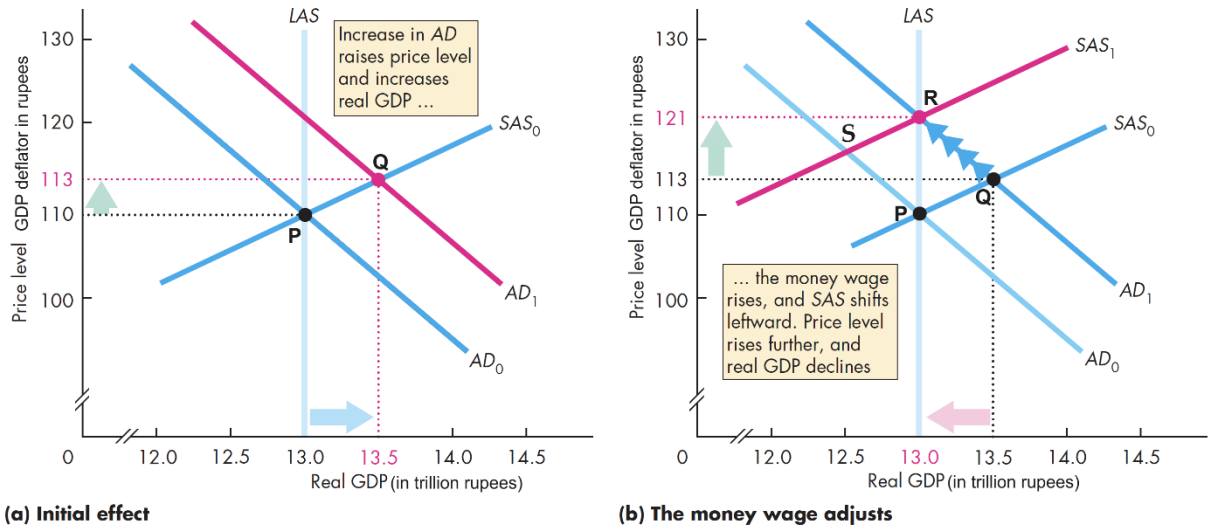

Figure 6

Figure 6 describes how a one-time demand shock leads to one-time increase in price level. But persistent inflation means that price level keeps on increasing at the rate of inflation year on year. For that, we require recurring aggregate demand shocks as shown in Figure 7.

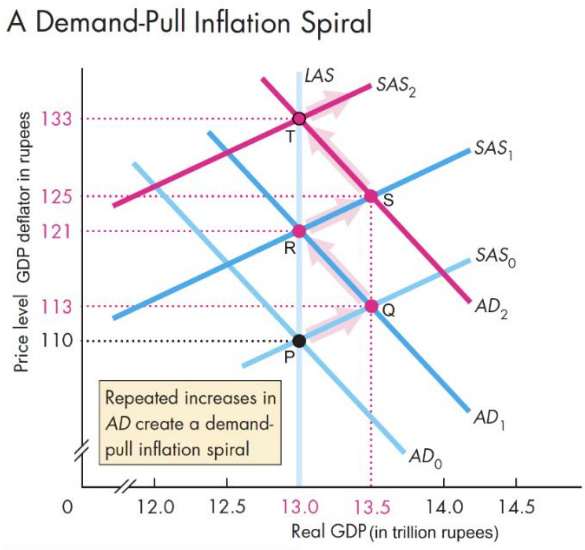

Figure 7

Suppose because of an initial aggregate demand shock, the economy moves from potential P to above potential Q along SAS_0. In the long run, the aggregate supply curve from SAS_0 to SAS_1, taking the economy from Q to R. The price level has increased further while national output is same as initial. Now the same quantity of output is being bought and sold at a higher price. So, people demand more nominal money to buy it. If RBI does not increase nominal money supply to match increased demand, then nominal (and real) interest rates increase in money market because of excess demand for nominal money. The increase in real interest rate decreases investment and consumption spending to bring the demand of money back at the earlier level. In other words, the aggregate demand shifts back from AD_1 to AD_0 and economy moves to S bringing real national output below 13 trillion along SAS_1. There is recession in the economy.

The RBI must increase nominal money supply not only to match the increased demand for nominal money but to match even increased demand for nominal money due to adaptive expectation of the next period inflation (equal to the inflation from P to R in this period). This is done to avoid contraction of aggregate demand in future. Therefore, there is even more money supplied than

demanded today. This leads to further right shift of aggregate demand from AD_1 to AD_2. This takes the economy to S in the short run but back to T in the long run. Hence inflation is now sustained due to just time demand shock.

In exam only draw Figure 7 and explain the movement from P to Q to R to S to T.

b. <u>Cost-Push inflation</u>

An inflation that starts because of an increase in costs is called a **cost-push** or supply-side inflation. The two main sources of cost increases are

1. An increase in the money (also called nominal) wage rate.
2. An increase in the prices of raw materials.

For a given output price level, the higher the cost of production, the smaller is the amount that firms are willing to produce. So, if the money wage rate rises or if the prices of raw materials (for example, crude oil) rise, firms decrease their supply of goods and services. The short-run aggregate supply curve in Figure 8 shifts leftward from SAS_0 to SAS_1.

As a result, the economy shifts from P to Q with aggregate output contracting and price level going up. Such a situation if prolonged is known as **stagflation** (stagnation of output + inflation). People are unhappy because of high unemployment.

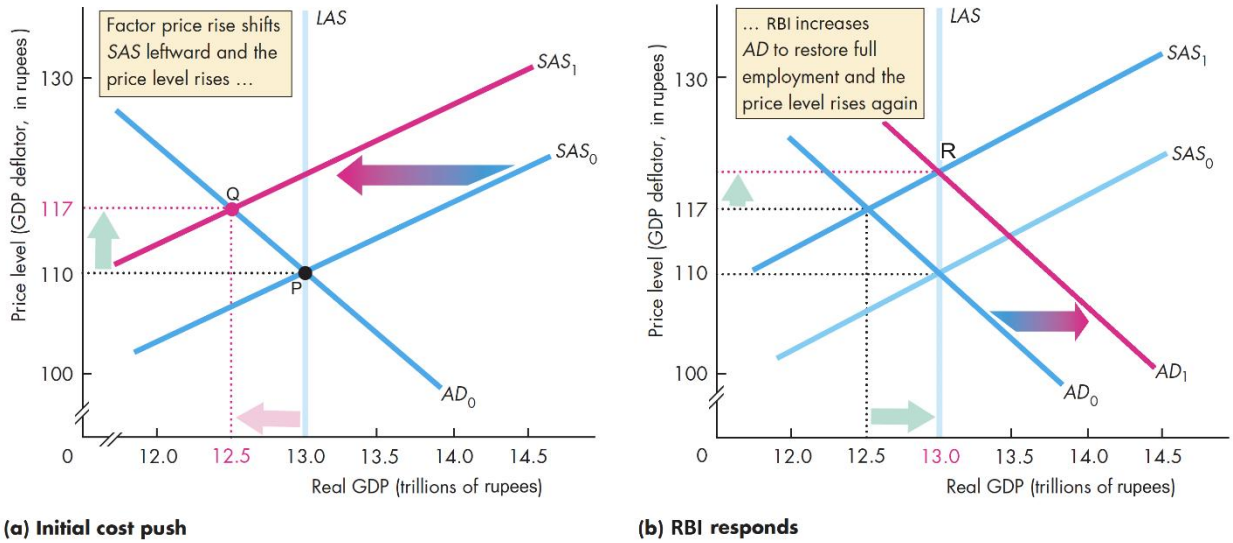

Figure 8

Finding the economy under stagnation, the RBI increases the nominal money supply to shift the aggregate demand from AD_0 to AD_1. This RBI achieves through reducing the interest rate in the money market. The real GDP recovers back to potential with this step but price level increases further to take the economy to R. Rest of the work is done by adaptive expectations which sustains the inflation year on year as explained above in the case of demand-pull inflation. This happens because RBI keeps increasing money supply in expectation of an increased money demand every year, which keeps shifting AD rightwards, economy above its potential in the short run and back to potential in the long run but at ever increasing price levels i.e. sustained inflation.

Measures to control Inflation

1. Monetary policy measures

   Inflation often occurs because more money is chasing fewer goods. One method of controlling inflation is to take away this excess money out to be deposited in the bank chasing higher interest rate. In other words, RBI reduces the supply of money. This reduction in money supply hurts the economy in the short run since when interest rates go up, the investment and consumption spending go down shifting the AD curve leftwards (you may draw one of the figures above with backward movements of AD). The economy moves along the SAS curve to a lower output and price level in the short run. Since prices are less (i.e. there is deflation) and since unemployment has increased because output is lower, workers accept lower money wages. The short run supply curve shifts rightwards because of lower production cost (draw the diagram yourself). The output goes up and prices fall further. This is just a reverse movement in figure 5.

   The RBI has many instruments to lower the supply of money. Following is the list:

   a. Open market operations

      This is when RBI buys or sells government securities (also known as bonds). When its sells (buys) bonds then it gets (pays) money removing (adding) money from (in) the economy. If RBI wants to control inflation then it will sell more government securities.

   b. Cash reserve ratio

      RBI mandates commercial banks keep a certain percentage of their total deposits (including loan deposits) in the form of cash with RBI. CRR is the minimum percentage of cash deposits that must be maintained by every commercial bank with RBI. When RBI increase (decreases) CRR then banks can offer less (more) loans to borrowers who then bid the interest rate up (down). This has the same effect of reducing (increasing) money supply because people start putting more (less) money in banks for better (worse) interest earnings and spend less (more).

This leads to AD shifts left (right) leading to fall (rise) in price. If RBI wants to control inflation, then it will increase CRR.

c. Bank rate policy
   RBI can control the various interest rates in the market through its control on the bank rate. It is the interest rate at which commercial banks borrow cash reserves from the RBI. If RBI asks a higher (lower) interest rate from banks, then all interest rate go up (down) because bank will then lend to their borrowers only at a higher (lower) interest since they have paid more (less) to their lender i.e. RBI. If RBI wants to control inflation, then it will raise the bank rate, thereby decreasing the supply of money in the market.
d. Moral suasion
   Just persuasion and pressure in the form of advisor from RBI to bank on banks to control quantity and quality of loans.

2. <u>Fiscal policy measures</u>
   There is another player apart from RBI which can control the over heated economy and inflation. Fiscal policy means changing G (government spending) or T (government's income). When government spends more (less) then AD shifts right (left) as in figure 5. When government taxes more (less) then it takes disposable income out of people's pockets which reduces (increases) their spending, thereby shifting Ad to the left (right). Thus, if government wants to control inflation, then it shifts AD to the left through decreased G or increased T.
3. <u>Price and wage control</u>
   These are direct price control especially on necessary goods, important inputs, and money wages. For example, the government sets upper limit on the prices of food gains, prices of oil (petrol) which is used as input in production, transportation etc.