

CBCS
University of Delhi
Introductory Macroeconomics-II
B.Com.(H) Economics-CBCS, May, 2019

Duration : 3 Hours

Maximum Marks : 75

All questions are to be attempted.
Part A of each question is compulsory.

1. Part A is compulsory. Do any *two* out of Parts B, C and D :

(A) From the following information, calculate GDP, Private Disposable Income and Private Savings :

Consumption	(2,2,1)
Compensation of Employees	4,500
Rental income of Persons	6,300
Proprietor's Income	600
Corporate Profits	900
Net Interest	700
Indirect Business Taxes	400
Consumption of fixed capital	500
Transfers received from Government	1,000
Interest Payment on Government Debt	350
Direct Taxes	200
	700

Answer Refer to Section 2.7

Solution:

(A) GDP is calculated by adding:

Compensation of Employees	= 6,300
Rental Income of Persons	= 600
Proprietor's Income	= 900
Corporate Profits	= 700
Net Interest	= 400
Indirect Business Taxes	= 500

Consumption of Fixed Capital = 1,000

∴ GDP = $\overline{10,400}$

Private Disposable Income = $Y + TR + INT - T$
 $= 10,400 + 350 + 200 - 700$
 $= 10,250$

Private Savings = Private Disposable Income - Consumption
 $= 10,250 - 4,500$
 $= 5750$

(B) (i) If expected rate of inflation is 6%, calculate the real rate of return on a 1 year bond of face value of ₹ 300, available for purchase at ₹ 250. (2)

(ii) How does the official settlement balance ensure that the "Fundamental Balance of Payments Identity" holds? (3)

Answer (i) Refer to Section 5.2.5

Solution:

(i) Nominal Rate of Return = $\frac{\text{Promised Payment} - \text{Price of Bond}}{\text{Price of Bond}}$
 $= \frac{300 - 250}{250} = 20\%$

Real Rate of Return = Nominal Return - Inflation
 $= 20 - 6$
 $= 14\%$

Answer (ii) Refer to Section 2.11

(C) How can National Savings, Private Savings and Government Savings be calculated? What will happen if Government Deficit increases? (5)

Answer Refer to Section 2.7

(D) (i) Do you agree with the statement that CPI inflation overstates increases in costs of living? Give reasons for your answer. (3)

Answer Refer to Section 2.10

(ii) With the help of data given below, calculate the rate of inflation for each year from 2014 to 2017 considering 2013 as base: (2)

microeconomics

Year	CPI
2013	60.0
2014	61.5
2015	65.0
2016	64.5
2017	66.0

consumption

Answer Refer to Section 2.10.2

Solution 2:

(i) CPI fails to take into account quality improvement in goods and services.

of return

purchase at
(2)

$$(i) \text{ For the year 2014} = \frac{61.5 - 60}{60} = 2.5\%$$

that the
(3)

$$(ii) \text{ For the year 2015} = \frac{65 - 60}{60} = 8.3\%$$

$$(iii) \text{ For the year 2016} = \frac{64.5 - 60}{60} = 7.5\%$$

$$(iv) \text{ For the year 2017} = \frac{66 - 60}{60} = 10\%$$

Part A is compulsory. Do any *three* out of parts B, C, D and E :

(A) (i) Do you agree with the statement that 'bond prices and rate of interest are negatively related' ? Give reasons for your answer. (2)

Answer Refer to Section 5.2.5

(ii) Calculate real interest rate given that rate of growth of real GDP is 7%, nominal interest rate is 14% and money supply increases at 16% per year. (2)

rings
? (5)

Answer Refer to Section 4.1.4

Solution:

(ii) % change in M + % change in V = % change in P + % change in Y

$$\text{or } 16 + V = P + 7$$

$$\therefore P = 9\% \quad (\text{since } V = 0)$$

Real Rate of Interest = Nominal Rate of Interest - Inflation Rate

$$= 14 - 9$$

$$= 5\%$$

ates
(3)on
2)

- (B) Explain the concept and causes of Hyperinflation? Suggest policies that the government can use to control Hyperinflation. 7

Answer Refer to Sections 6.6.1, 6.6.4, 6.6.5 and 6.6.6.

- (C) What is High Powered Money? To what extent does High Powered Money affect the Money Supply in an economy? 7

Answer Refer to Section 5.3.5

- (D) (i) Given the Quantity Theory of Money, assume that income is 1000 units and money supply is 400 units. Also assume that velocity of circulation of money is 5. Calculate the aggregate price level. What will happen to the price level if money supply rises to 600 units? Explain. 4

Answer Refer to Section 4.1.2

Sol.: (i) Given : Income = 1,000, Money Supply = 400, $V = 5$

$$MV = PY$$

... from QTM

$$\therefore 400 \times 5 = P \times 1,000$$

$$\Rightarrow P = \frac{2,000}{1,000} = 2$$

If money supply rises to 600, then:

$$MV = PY$$

$$\therefore 600 \times 5 = P \times 1,000$$

$$\Rightarrow P = \frac{3,000}{1,000} = 3$$

- (ii) How are the costs of expected inflation different from the costs of unexpected inflation? 3

Answer Refer to Section 6.4

- (E) (i) Explain the statement that 'financing a large deficit with seigniorage can only lead to high inflation'. 5

Answer Refer to Section 6.3.2

- (ii) With constant levels of velocity of money and GDP, the government raises money supply by 5%. Assuming a real rate of interest of 8%, calculate the nominal rate of interest. 2

Answer Refer to Section 4.1.4

Solution: Given : $V = \text{constant}$

$GDP = \text{constant}$

Money supply rises by = 5%

Real rate of interest = 8%

From Quantity theory of money, we have:

$$\% \Delta \text{ in } M + \% \Delta \text{ in } V = \% \Delta \text{ in } P + \% \Delta \text{ in } Y$$

$$\text{or } 5 + \text{zero} = \% \Delta \text{ in } P + \text{zero}$$

$$\therefore \% \Delta \text{ in } P \text{ or inflation rate} = 5\%$$

We know:

Real Rate of Interest = Nominal Rate of Interest - Inflation Rate

$$\therefore 8\% = \text{Nominal Rate of Interest} - 5\%$$

$$\Rightarrow \text{Nominal Rate of Interest} = 13\%$$

3. Part A is compulsory. Do any *three* out of parts B, C, D and E :

(A) (i) How does an increase in autonomous spending affect the equilibrium level of income? Explain using IS-LM analysis. (3)

Answer Refer to Section 9.5

(ii) What is the relevance of Okun's law? (2)

Answer Refer to Section 7.9.2

(B) (i) Suppose that in an economy

$$C = 100 + 0.8 Y_D$$

$$\bar{I} = 70$$

$$\bar{G} = 200$$

$$\bar{TR} = 150$$

$$t = 0.20$$

(a) Calculate the equilibrium level of income and multiplier in this model.

(b) Calculate the budget surplus.

(c) What will be the new equilibrium income and the new multiplier if t increases to 0.25? 22,1

(ii) Derive the balanced budget multiplier. (3)

(iii) Under what circumstances can the LM curve be horizontal? Use suitable diagram to explain. (2)

Answer (B) Refer to chapter 8

Solution (i) (a) $Y = C + I + G$

$$Y = 100 + 0.8(Y - T + TR) + 70 + 200$$

$$Y = 370 + 0.8(Y - 0.20Y + 150)$$

$$\therefore Y = \frac{490}{0.36} = 1361$$

$$\begin{aligned} \text{Multiplier} = m_G &= \frac{1}{1 - c(1 - t)} \\ &= \frac{1}{1 - 0.8(1 - 0.20)} = \frac{1}{0.36} = 2.8 \end{aligned}$$

$$\begin{aligned} (b) \quad BS &= ty - G - TR \\ &= 0.20 \times 1361 - 200 - 150 \\ &= -78 \end{aligned}$$

(c) If $t = 0.25$, then:

$$Y = 370 + 0.8(Y - 0.25Y + 150)$$

$$Y = \frac{490}{0.4}$$

$$\therefore Y = 1225$$

$$\begin{aligned} m_G &= \frac{1}{1 - 0.8(1 - 0.25)} \\ &= \frac{1}{1 - 0.8(0.75)} = \frac{1}{0.4} = 2.5 \end{aligned}$$

(ii) Balanced Budget Multiplier = 1 (since $\Delta TA = \Delta G = \Delta Y$)

(iii) Refer to Section 10.2.1 (point 1)

(C) (i) Given that in an economy:

$$C = 0.8(1 - t)Y$$

$$t = 0.25$$

$$I = 900 - 50i$$

$$\bar{G} = 800$$

$$L = 0.25Y - 62.5i$$

$$(\bar{M}/\bar{P}) = 500$$

(a) Derive the equation for the IS curve.

(b) Derive the equation for the LM curve.

- (c) What are the equilibrium levels of income and the interest rate? 2,2,2

Answer Refer to Page 11.4.3

Solution: (i)

$$Y = C + I + G \quad \text{.....IS equation}$$

$$Y = 0.8(1 - 0.25)Y + (900 - 50i) + 800$$

or $Y = 4250 - 125i$

$$\frac{\bar{M}}{\bar{P}} = L \quad \text{.....LM equation}$$

$$500 = 0.25Y - 62.5i$$

or $Y = 2,000 + 250i$

$$IS = LM \quad \text{.....in equilibrium}$$

$$4250 - 125i = 2,000 + 250i$$

$$\therefore i = 6\%$$

Substituting value of i in IS or LM equation, we get:

$$Y = 4250 - 125 \times 6$$

$$\therefore Y = 3,500$$

- (ii) Explain policy mix. What is its significance? Explain using suitable diagram. 4

Answer Refer to Section 10.4.2

- (D) Explain the following using suitable diagrams :

- (i) Show that both government spending and the tax rate affect the IS schedule. 3

Answer Refer to Sections 9.2.5 and 9.2.6

- (ii) How will an increase in real money stock affect equilibrium income and equilibrium interest rate? Explain using IS-LM analysis. 3

Answer Refer to Section 9.3.4

- (iii) In the context of fiscal policy what is crowding out? How does the liquidity trap affect crowding out? 4

Answer Refer to Sections 10.3.1, 10.3.2, 10.3.3 (Point 1)

- (E) (i) Consider two policy options, one of an investment subsidy and another of a rise in income tax rates. Using the IS-LM model, discuss the impact of these policies on income, interest rates and investment. 5

Answer Refer to Section 10.4.1

- (ii) How is the effect of monetary policy different from the effect of a fiscal policy as a tool of stabilization ? Explain using suitable diagram.

Answer Refer to Section 10.4.1

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Introductory Macroeconomics - Generic Economics-II (2018)

Duration : 3 Hours

Maximum Marks : 75

Answer any *five* questions. *All* questions carry equal marks.

- (a) Imagine an economy with only two business firms, XYZ Ltd. and ABC Ltd. The XYZ Ltd. owns wheat farm. It sells some of its wheat production directly to the public and rest to ABC Ltd, which produces and sells bread. The following table shows the transactions of each business during a year:

S.No. Particulars	Amount (₹)
1. Wages paid to employees	60,000
2. Tax paid to government	20,000
3. Revenue received from the sale of wheat :	
(i) Wheat sold to public ₹ 40,000	
(ii) Wheat sold to ABC Ltd ₹ 1,00,000	1,40,000
ABC Ltd Transactions	
1. Wages paid to employees	40,000
2. Taxes paid to government	8,000
3. Wheat purchased from XYZ Ltd.	1,00,000
4. Revenue received from sale of bread	1,60,000

Calculate GDP, using product method.

(3)

Ans.:

GDP using product method = 1,40,000 + 60,000 = ₹ 2,00,000

GDP calculated at market price = ₹ 2,28,000

- (b) (i) Calculate the money growth rate required to finance the budget deficit of ₹ 10,000 in an economy. Given the following information:

Income (Y) = ₹ 1,00,000

Nominal Money Supply (M) = ₹ 80,000

Price Level (P) = ₹ 20

(3)

Ans.:

$$\frac{\text{Seignorage}}{Y} = \left(\frac{\Delta M}{M} \right) \left(\frac{M/P}{Y} \right)$$

$$\Rightarrow \frac{10,000}{1,00,000} = \left(\frac{\Delta M}{M} \right) \frac{80,000/20}{1,00,000}$$

$$\Rightarrow \frac{1}{10} = \frac{\Delta M}{M} \cdot \frac{4}{100}$$

$$\Rightarrow \frac{\Delta M}{M} = 2.5$$

\therefore Money growth rate required is 2.5

(ii) What is Hyperinflation? (2)

Ans.: Section 9.6

(c) Explain the effect of adverse supply shock on price level and output in the following conditions with suitable diagram:

(i) When aggregate demand is held constant.

Ans.: Section 10.2.8 (Fig. 10.15)

(ii) When aggregate demand can be increased. (7)

Ans.: Section 10.2.8 (Fig. 10.14)

2. (a) Explain the components of current account of balance of payments. (3)

Ans.: Sections 3.3, 3.3.1

(b) What happens to the equilibrium rate of interest in the following situations? Use suitable diagram.

(i) Decrease in nominal income

Ans.: Section 6.6.2

(ii) Decrease in money supply. (5)

Ans.: Section 6.6.3

(c) (i) Define IS-curve. Explain its derivation graphically. (3)

Ans.: Section 12.2.3

(ii) Explain the factors causing shift in IS-curve. Use suitable diagram. (4)

Ans.: Section 12.2.5

(a) Briefly explain the following concepts:

(i) Business fixed investment.

Ans.: Section 2.4.3

(ii) GDP and GNP

Ans.: Section 2.3.1, 2.3.2

(b) Rohit borrowed ₹ 50 lakh from a bank in 2015 at some rate of interest to be paid in 2016. During the course of the year actual inflation was not equal to the anticipated inflation. Who gained and who lost and why? Explain in both situations: (i) when anticipated inflation is greater than actual inflation (ii) when anticipated inflation is less than actual inflation.

(5)

(i) If anticipated inflation is greater than actual inflation, lenders will gain and borrowers will loose.

(ii) If anticipated inflation is less than actual inflation, lenders will loose and borrowers will gain.

(c) (i) Explain the various stages in the monetary transmission mechanism.

(4)

Ans.: Section 12.8.1

(ii) How does increase in the money supply affect the price level and output in the long-run? Explain using AD and AS curves as per classical model.

(3)

Ans.: Section 10.2.7 (Fig.10.11)

(a) Which of the following transactions are included in the calculation of India's GDP? Give reasons in support of your answer:

(i) Interest on national debt.

(ii) Commission charged by a real estate agent.

(3)

Ans.: Section 2.3.1

(b) Given the following information:

Quantity of money (M) = ₹ 4,800

Nominal GDP = ₹ 96,000

Real GDP = ₹ 48,000

(i) What is the price level and velocity of money in this country? (2)

Ans.: (i) GDP deflator = $(96,000/48,000) \times 100 = 200 = 2P$ (i.e., price is double)

$$MV = PY$$

$$\Rightarrow 4,800 V = 96,000$$

$$\therefore V = 20$$

(ii) Suppose the velocity is constant and the economy's output rises by percent each year. What quantity of money and money supply should central bank set next year if it wants to keep the price level stable?

(3)

Ans.: (ii) $\Delta M = 20\%$ of $4,800 = 960$

$$\therefore M = 4,800 + 960 = 5,760$$

$$\therefore \text{Money Supply} = MV = 5,760 \times 20 = ₹ 1,15,200$$

(c) Explain the effect of investment subsidy on equilibrium interest rate, consumption investment and GDP. Use suitable diagram. Compare the results with other fiscal policy measures. (7)

Ans.: Section 12.10.1, Fig. 12.21

5. (a) Why are market values used to measure GDP? Explain with example. (3)

Ans.: Refer to Section 2.3.1

(b) Explain the determinants of the demand and supply of central bank money. (5)

Ans.: Refer to Section 7.3

(c) Using the equilibrium condition in financial market (loanable funds), show the effect on equilibrium interest rate, national savings and investment in the following cases:

(i) An increase in government purchases.

(ii) A decrease in amount of taxes.

Use suitable diagram. (7)

Ans.: Section 10.2.5

6. (a) Use the following data to calculate private savings and government savings

GDP	₹ 8,000
Net factor payment from abroad	₹ (-) 100
Consumption	₹ 2,500
Government purchase	₹ 1,500

Interest payment on government debt

₹ 250

Taxes

₹ 2,800

Transfers

₹ 1,200

Ans.:
 Private Saving = Private Disposable Income - Consumption
 = $(Y + TR - T + NFP + INT) - C$
 = $[8,000 + 1,200 - 2,800 + (-100) + 250] - 2,500 = ₹ 4,050$
 Govt. Saving = Net Government income - Government Purchases
 = $[T - TR - INT] - G = [2,800 - 1,200 - 250] - 1,500 = ₹ -150$
 (deficit)

(b) Using the quantity theory of money and the Fisher equation, explain in detail how the rate of growth in money affects the nominal interest rate. (5)

Answer Sections 5.3, 5.3.1, 5.3.2

(c) (i) Derive the aggregate demand curve using classical quantity equation? (3)

Ans.: Section 5.5

(ii) Explain the role of multiplier in determining the slope of IS-curve. Use appropriate diagram. (4)

Ans.: Section 12.3.3

(a) The following data is given for two years output and prices for an economy:

Commodities	2011		2012	
	Price	Output (kg)	Price (₹)	Output (kg)
A	10	60	16	100
B	6	80	12	140

Calculate the Nominal GDP, Real GDP and GDP deflator taking 2011 as base year. (3)

Ans.:

Nominal GDP (2012) = $16 \times 100 + 12 \times 140 = 3,280$
 Real GDP (2012) = $10 \times 100 + 6 \times 140 = 1,840$
 Nominal GDP (2011) = $10 \times 60 + 6 \times 80 = 1,080$
 GDP Deflator (2012) = $(\text{Nominal GDP} / \text{Real GDP}) \times 100$
 = $\frac{3,280}{1,840} \times 100 = 178.26$

(b) State and explain various costs of hyperinflation in an economy. (5)

Ans.: Section 9.6.1

(c) Given the following information:

Consumption $C = 360 + 0.80Y_d; Y_d = Y - T$

Investment $I = 640 - 6i$

Government expenditure $G = 160$

Tax $T = 200$

Price level $P = 3$

Nominal Money Supply $M = 1200$

Demand for money $L = 0.2Y - 4i$

(2) Full employment level of income $Y_f = ₹ 4,700$

(i) Compute the value of Monetary and Fiscal policy multipliers.

Ans.: IS Equation : $Y = 5,000 - 30i$

LM Equation : $Y = 2,000 + 20i$

Solving for 'i' and 'Y', we get:

$i = 60$ and $Y = 3,200$

$$\text{Fiscal policy multiplier} = \gamma = \frac{h \cdot \alpha_G}{h + kb \alpha_G}$$

$$= \frac{4 \times 5}{4 + 0.2 \times 6 \times 5}$$

$$= 2$$

$$\text{Monetary policy multiplier} = \frac{b \alpha_G}{h + kb \alpha_G}$$

$$= \frac{6 \times 5}{4 + 0.2 \times 6 \times 5} = 3$$

(ii) Compute the increase in the nominal supply of money required to achieve full employment.

Ans.: LM Equation: $Y = 2,000 + 20i$, for $Y_f = 4,700$

$$L = 0.2 Y - 4i$$

$$L = 0.2 \times 4700 - 4 \times 60$$

$$\therefore L = 700$$

$$L = M/P$$

$$\Rightarrow L = M(Y_p)/P$$

$$\Rightarrow 700 = M(Y_p)/3$$

$$\Rightarrow M(Y_p) = 2,100$$

$$\therefore \text{Change in money supply} = 2,100 - 1,200 = 900$$

(iii) Compute the increase in government expenditure required to achieve full employment. (3,2,2)

$$Y = 200 + 0.8Y + 640 - 6i + G(Y_p)$$

$$\Rightarrow 0.2Y = 840 - 360 + G(Y_p)$$

$$\Rightarrow G(Y_p) = 460$$

$$\therefore \Delta G = 460 - 160 = 300$$

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A. (Hons.) Introductory Macroeconomics, Semester - II (2016)

of Question Paper : 3957

Unique Paper Code: 12271201

Duration : 3 Hours

Maximum Marks : 75

Attempt any five questions

Part (a) is Compulsory. Do any 2 out of Parts (b), (c) and (d).

a) Determine the contribution of each of the following transactions to the current year's GDP. Explain your answer.

(i) Mr. X purchases a 10 year old apartment for ₹50 lakhs. The broker's fee is 5%.

$$\text{Ans.: Broker's income} = \frac{5}{100} \times 50 = ₹2.5 \text{ Lakhs}$$

(ii) A homemaker takes up a job that will pay ₹1,40,000 over a year. She also pays ₹24,000 over the year for professional house keeping services.

$$\text{Ans.: Homemaker's income} + \text{payment for housekeeping services} = 1,40,000 + 24,000 = ₹1,64,000$$

(iii) Your neighbour has won ₹1 lakh in the state lottery, to be paid to him immediately.

Ans.: There is no contribution. It is a transfer payment, against which no specific service is expected.

(iv) A Korean Company builds a factory in Haryana for ₹10 Crores using only local labour and materials.

Ans.: Capital good is a final good. So, ₹10 crores is contribution to current year's GDP.

(v) The Government buys defense equipment worth ₹2 crores.

$$\text{Ans.: Government expenditure} = ₹2 \text{ crore} \quad (5)$$

(b) The following information pertains to an economy

Gross Domestic Private Investment (I)	= 60
Government purchases of goods and services (G)	= 50
Gross National Product (GNP)	= 300
Current account balance (CA)	= -30
Taxes (T)	= 100

Government transfer payments to the domestic private sector (TR) = 50

Interest payments from the Government to the domestic private sector (INT) = 20

Factor incomes received from rest of the world = 10

Factor payments made to rest of the world = 15

Assuming Government Investment = 0, Calculate

(i) Private Consumption Expenditure (C) (5)

$$\text{Ans.: GNP} = \text{GDP} + \text{NFIFA} \Rightarrow \text{GDP} = 300 - (10 - 15) = 305$$

$$\text{Current Account Balance (CA)} = \text{NX} + \text{NFIFA} \Rightarrow \text{NX} = -30 + 5 = -25$$

$$\text{Private Consumption Expenditure (C)} = Y - I - G - NX = 305 - 60 - 50 - (-25) = 220$$

(ii) Private savings and Government savings

$$\text{Ans.: Private Saving} = Y + NFIFA + INT + TR - T - C$$

$$= 305 - 5 + 20 + 50 - 100 - 220 = 50$$

$$\text{Government Saving} = T - TR - INT - G = 100 - 50 - 20 - 50 = -20$$

(iii) Establish the "Uses of Private Savings" Identity.

$$\text{Ans.: Private Saving} = I + \text{Government Deficit} + CA$$

$$\Rightarrow 50 = 60 + 20 + (-30)$$

This identity helps to find Government deficit, which is 20 here.

- (c) (i) Ram grows apples and oranges. Last year he harvested 1,800 apples and 900 oranges. He values 1 orange worth 3 apples. In exchange for helping him, he gave Mohan 600 apples and 300 oranges, all of which were consumed by Mohan. Ram, set aside 200 oranges to help with next year's harvest. What is total Consumption in terms of oranges?

$$\text{Ans.: Ram's consumption} = (1,800 - 600) \text{ Apples} + (900 - 300 - 200) \text{ Oranges} = 1,200 \text{ Apples} + 400 \text{ Oranges} = 800 \text{ Oranges}$$

$$\text{Mohan's Consumption} = 600 \text{ Apples} + 300 \text{ Oranges} = 500 \text{ Oranges}$$

$$\text{Total Consumption} = 1,300 \text{ oranges}$$

- (ii) What are inventories? How are they treated as - final or intermediate good - in National Income Accounting? (3+2)

Ans.: Inventories are stocks of unsold finished goods, goods in process and raw materials held by the firms. Inventory may be final or intermediate. The former is ultimately used or consumed. The latter good not used up during their year of production is treated as capital good. Thus, inventory is final good.

- (d) (i) A person from country 'A' travels to country 'B' and buys a \$100 worth household electronic machine from a company. The company then deposits the \$100 cheque it receives in its account with its bank in country 'A'. How would these transactions show up in the 'Balance of Payments' accounts of country 'A'?

Ans.: Country 'A' imports machine worth \$100. So, it shows debit of \$100 in its current account. As the cheque is deposited by the company of country 'B' in its bank in country 'A'. It shows financial account credit (asset export) of \$ 100.

- (ii) Nominal GDP in a country was \$6,890 billion in 2012 and \$7,650 billion in 2013. The GDP deflator was 102.4 in 2012 and 105.6 in 2013.

- (a) What is the inflation rate from 2012 to 2013?

$$\text{Ans.: Inflation Rate} = \frac{(105.6 - 102.4)}{102.4} \times 100 = \frac{3.2}{102.4} \times 100 = 3.125\%$$

- (b) What is the growth rate of real GDP from 2012 to 2013? (2+3)

$$\text{Ans.: Real GDP (2012)} = \frac{6,890}{102.4} \times 100 = 6,728.52$$

$$\text{Real GDP (2013)} = \frac{7,650}{105.6} \times 100 = 7,244.32$$

$$\text{Growth rate of GDP} = \frac{(7,244.32 - 6,728.52)}{6,728.52} \times 100 = \frac{515.8}{6,728.52} \times 100 = 7.66\%$$

Part (a) is Compulsory. Do any 3 out of Part (b), (c), (d) and (e).

(a) The following information pertains to a classical macroeconomic model. Real output = 2,000, Money Stock = 800, Income velocity of money = 25

(i) What are the aggregate demand and aggregate supply schedules? Roughly sketch them.

Ans.: Aggregate Demand (AD) = $800 \times 25 = PY$, i.e. $Y = \frac{20,000}{P}$ (See Fig. 1)

Aggregate Supply (AS) = $Y = 2,000$ (See Fig. 2)

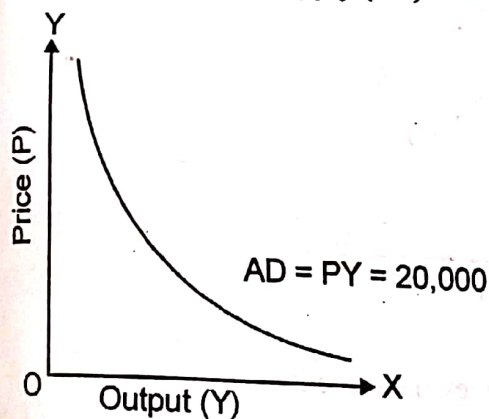


Fig. 1: Aggregate Demand

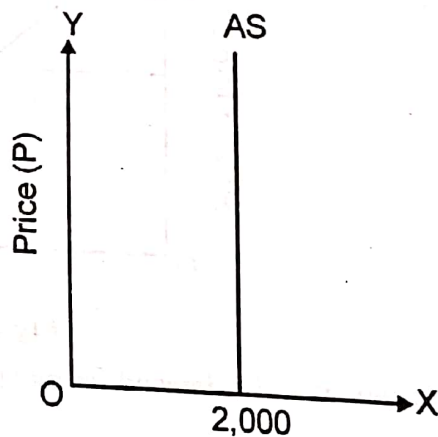


Fig. 2: Aggregate Supply

(ii) If the money stock increases to 1,000, how will the schedules shift? (4)

Ans.: If money stock (M) rises to 1,000, $PY = 1,000 \times 25 = 25,000$. So, AD curve shifts to the right. However, there is no impact on AS.

(b) (i) Comment on the following statements. Justify your answer.

(a) An increase in nominal money growth rate will always increase seignorage.

Ans.: It is uncertain. A rise in nominal money growth $(\frac{\Delta M}{M})$ generally causes a rise in seignorage $(\frac{\Delta M}{P})$. While, an increase in $\frac{\Delta M}{P}$ may increase expected inflation (π^e) raising interest rate (i), bringing down $\frac{M}{P}$ and hence seignorage.

Here, seignorage $\left(\frac{\Delta M}{P}\right) = \frac{\Delta M}{M} \cdot \frac{M}{P}$

(b) The inflation tax is always equal to seignorage.

Ans.: Inflation tax = $\pi \left(\frac{M}{P}\right)$.

Thus, seignorage = inflation tax only if $\pi = \frac{\Delta M}{M}$

- (ii) In a classical macroeconomic model, what will be the impact of a 20% increase in the supply of money, holding everything else constant, on the price level, money wages, real output, interest rate, employment and nominal output? (4+3)

Ans.: There will be the 20% rise in price level, 20% rise in money wages, no change in real output, no change in interest rate, no change in employment and 20% rise in nominal output.

- (c) (i) Graphically illustrate and briefly explain the impact of an increase in the reserve ratio, θ , on the market for Central Bank money.

Ans.: Increase in the reserve ratio (θ) increases R^d and hence M^d resulting in rightward shift of the M^d curve. As a result, the rate of interest rises, as shown in Fig. 3.

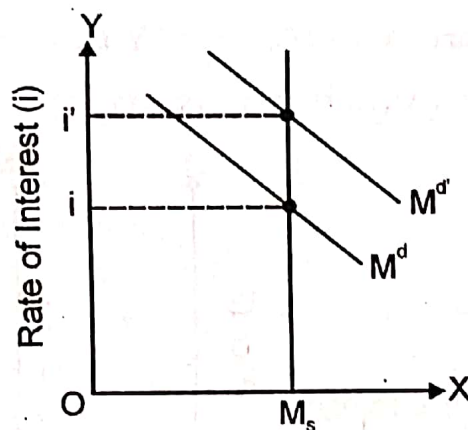


Fig. 3

- (ii) Assume that the demand for real money balances is :

$$\frac{M}{P} = Y \left[0.6 - (r + \pi^e) \right]$$

Income (Y) = 1,000, real interest rate (r) = 0.05 (5%), expected inflation rate (π^e) is constant at 0.05 (5%). Calculate seignorage if the rate of growth of nominal money is 7%. (4+3)

$$\begin{aligned} \text{Ans.: } \frac{M}{P} &= .6Y - (.05 + .05)Y = 0.6Y - 0.1Y \\ &= .5Y = .5 \times 1,000 = 500 \end{aligned}$$

$$\therefore \text{ Seignorage } \left(\frac{\Delta M}{P} \right) = \frac{\Delta M}{M} \times \frac{M}{P} = 0.7 \times 500 = 35$$

- (d) Given Reserves(R) = 500, Deposits(D) = 4,000, Currency(CU) = 2,500. Calculate

- (i) The size of the monetary base (H)

$$\text{Ans.: } H = CU + R = 2,500 + 500 = 3,000$$

- (ii) The money multiplier (mm)

$$\text{Ans.: } mm = \frac{M}{P} = \frac{CU + D}{CU + R} = \frac{6,500}{3,000}$$

- (iii) Given the above values, fill in the Assets and Liabilities in the Central Bank's balance sheet and the Banks' balance sheet

Banks' Balance Sheet

Assets	Liabilities
Reserve (R) = 500	Deposits (D) = 4,000
Bond holdings = 3,500	
4,000	4,000

Central Banks' Balance Sheet

Assets	Liabilities
Bond = 3,000	Currency (CU) = 2,500
	Reserve (R) = 500
4,000	4,000

- (iv) Suppose the Central Bank wants to reduce the money supply by ₹65 crores, what type of Open Market Operation should it pursue? What should be the value of the Central Bank's purchase or sale of bonds so that it is successful? (7)

Ans.: Central Bank should use contractionary open market operations. In other words, it should sell bonds. Value of sale of bonds (ΔM) = mm ΔH

$$\Rightarrow \Delta H = \frac{\Delta M}{mm} = \frac{65}{65/30} = ₹30 \text{ crore}$$

- (i) Suppose the ratio of currency to checkable deposits is 0.25 and the reserve ratio (R/D) is 0.25, what is the value of the money multiplier?

Ans: $\frac{CU}{D} = .25$ and $O = \frac{R}{D} = .25$

$$\Rightarrow c = \frac{CU}{M} = \frac{.25D}{D + .25D} = \frac{1}{5}$$

$$\Rightarrow mm = \frac{1}{c + Q(1-c)} = \frac{1}{0.2 + 0.25(1-0.2)} = \frac{1}{0.2 + 0.2} = \frac{1}{0.4} = 2.5$$

- (ii) Differentiate between 'Orthodox' and 'Heterodox' stabilisation programmes adopted during hyperinflation.

Ans.: 'Orthodox' stabilisation programmes rely only on monetary and fiscal policies. On the other hand, heterodox stabilisation programmes also employ income policies (e.g. wage and price controls) besides monetary and fiscal instruments.

- (iii) Given that, a bond pays ₹1,000 in a year and the yield on it is 15%, calculate the price of this bond. (3+3+1)

Ans.: $P_B = \frac{1,000}{1.15} = ₹869.57$

3. Part (a) is Compulsory. Do any 3 out of Parts (b), (c), (d) and (e).

(a) Comment on the following statements in the context of IS-LM framework:

(i) An increase in the Government spending leads to an increase in income but by an amount less than the horizontal shift in the IS curve.

Ans.: It is due to crowding out effect. Read Section 12.7.3

(ii) An expansionary monetary policy is always effective in expanding output in the economy.

Ans.: This is true only if the transmission mechanism works well. There are critical links between the change in money supply and the ultimate effect on income. Rise in money supply (M_s) by bringing about portfolio disequilibrium leads to a decrease in rate in interest. Further, a fall in rate of interest rate must lead to an increase in aggregate demand (AD) and hence rise in income (Y).

(b) (i) Assume the following IS - LM model

Expenditure Sector

$$\text{Private Consumption Expenditure (C)} = 100 + \frac{3}{5} Y_D, \text{ Taxes (t)} = \frac{1}{6} Y$$

$$\text{Private Investment Expenditure (I)} = 210 - 10i$$

$$\text{Government Purchases (G)} = 200, \text{ Net Exports} = -10$$

Money Market

$$\text{Demand for Money } M^d = \frac{1}{4} Y - 5i, \text{ Nominal Money (M)} = 300, \text{ Price Level (P)} = 2, \text{ Where}$$

Y_D = Disposable Income of the Private Sector

Y = Income

i = interest rate

$$\text{Ans.: IS Equation: } Y = C + I + G + NX$$

$$= 100 + \frac{3}{5} \left(Y - \frac{1}{6} Y \right) + 210 - 10i + 190 = \frac{1}{2} Y + 500 - 10i$$

$$\Rightarrow Y = 1000 - 20i$$

$$\text{LM Equation } \frac{M}{P} = M^d \Rightarrow 150 = \frac{1}{4} Y - 5i \Rightarrow Y = 600 + 20i$$

Solving IS and LM equations

$$i = 10 \text{ and } Y = 800$$

(a) Derive the equilibrium value of C (Private Consumption Expenditure) and M^d (Demand for money)

$$\text{Ans.: Equilibrium } C = 100 + \frac{3}{5} \cdot \frac{5}{6} \times 800 = 500$$

$$\text{Equilibrium } M^d = M^s (\text{real}) = 150$$

- (b) How much Investment will be crowded out if the Government increases its purchases by 100 ?

Ans.: Here, $\Delta G = 100$

IS shifts by $\alpha_G \Delta G = 2 \times 100 = 200$

$$\alpha_G = \frac{1}{1-c(1-t)} = \frac{1}{1-\frac{3}{5}\left(1-\frac{1}{6}\right)} = \frac{1}{\frac{1}{2}} = 2$$

New IS Equation: $Y = 1,200 - 20i$

New LM Equation: $Y = 600 + 20i$

solving IS and LM equations simultaneously, we get

$$i = 15$$

$$\Rightarrow \Delta i = 5$$

Thus, crowding out $(\Delta I) = -10(\Delta i) = -50$

- (ii) In a simple model of the expenditure sector with a tax rate t , does a fall in autonomous investment affect the Budget Surplus ? Explain. (8+2)

Ans.: Budget Surplus (BS) = $tY - G - TR$

A decrease in investment reduces the aggregate demand and hence income. Thus, the budget surplus declines.

- (c) (i) A fall in the income tax rate will increase consumer spending; therefore, the demand for money will go up and the LM curve will shift to the right. Explain using diagrams whether you agree or disagree.

Ans.: A fall in income tax rate (t) will shift the IS curve, but not the LM curve. A fall in 't' raises government expenditure multiplier (α_G). Thus, IS becomes flatter. Its intercept (vertical) remains the same (Fig. 4).

$$\text{IS Equation: } i = \frac{\bar{A}}{b} - \frac{Y}{b\alpha_G}$$

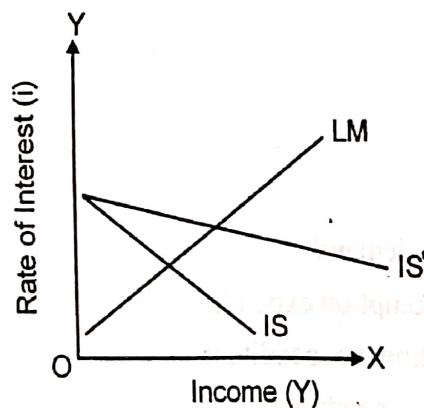


Fig. 4

Here, money supply (M_s) does not change. So, there is no change in LM and no change in money demand (M_d) as money market is equilibrium.

- (ii) In a simple model of the expenditure sector, by how much should the Government reduce its spending so that the Budget Deficit falls by 1,000? Assume that the income tax rate is $33\frac{1}{3}\%$ and that the marginal propensity to consume is 0.6.

Ans.: $\Delta BD = \Delta G - \Delta TA$

$$\Rightarrow -1000 = \Delta G - \frac{1}{3} \Delta Y = \Delta G - \frac{1}{3} [\alpha_G \Delta G]$$

$$= \Delta G \left[1 - \frac{5}{3} \times \frac{1}{3} \right] = \Delta G \frac{4}{9}$$

$$\therefore \alpha_G = \frac{1}{1 - c(1-t)} = \frac{1}{1 - 0.6 \times \frac{2}{3}} = \frac{5}{3}$$

$$= \Delta G = \frac{9}{4} \times 1,000 = -2,250$$

- (iii) Explain how 'Income tax system' works as an 'automatic stabiliser'. (4+4+2)

Ans.: Income tax makes α_G smaller. Thus, there is smaller change in income (Y) due to change in aggregate demand (AD).

- (d) (i) In the Classical Model, there is a positive relationship between real wages and output. Comment.

Ans.: The answer depends upon whether L^s or L^d is shifting. If the increase in output is caused by rise in L^s , there is negative relationship between real wage and output. On the contrary, if the increase in output is caused by rise in L^d , there will be positive relationship between real wage and output.

- (ii) Assume an economy described by the following equations

Expenditure Sector

$$AD = C + I + G + NX$$

$$AD = 300 + \frac{4}{5} Y - 20i$$

Money Market

$$M^d = \frac{1}{3} Y - 50i$$

$$M/P = 200$$

Where :

AD = Aggregate demand

C = Private consumption expenditure

I = Private investment expenditure

G = Government Expenditure

NX = Net Exports

M^d = Demand for money

M/P = Real Money Supply

Y = Income

i = interest rate

(a) Calculate the equilibrium levels of Y (income) and i (interest rate).

Ans.: IS Equation: $Y = 300 + \frac{4}{5} Y - 20i$

$$\Rightarrow Y = 1,500 - 100i$$

LM Equation: $200 = \frac{1}{3} Y - 50i$

$$\Rightarrow Y = 600 + 150i$$

Solving IS and LM equations, we get

$$i = \frac{90}{25} = 3.6 \text{ and } Y = 1,140$$

(b) What should be the money supply increase by the Central Bank, if its goal is to keep interest rate constant after Government purchases increased by 100? (4+6)

Ans.: If $\Delta G = 100$, IS shifts by $\alpha_G \Delta G = 5 \times 100 = 500$ $\left(\because \alpha_G = \frac{1}{1 - \frac{4}{5}} = 5 \right)$

If ' i ' is to be kept constant, LM must shift by the same amount, i.e.,

$$\frac{1}{K} \Delta \left(\frac{M}{P} \right) = 500$$

$$\Rightarrow \Delta \left(\frac{M}{P} \right) = 500 \times K = \frac{500}{3}$$

(e) (i) In the Classical Model, an autonomous decline in Investment leads to a fall in the overall demand in the economy. Explain, with the help of a diagram, whether you agree or disagree.

Ans.: A fall in investment (I) does not cause a fall in aggregate demand (AD), as shown in Fig. 5. At initial equilibrium point E_0 , saving curve ' S ' intersects the original investment curve I_0 . Here,

$$\text{Rate of Interest}(r) = r_0$$

$$\text{and, } S = I_0$$

At new equilibrium point ' E ', new investment curve ' I ' intersects saving curve ' S '. Here,

$$r < r_0$$

A decrease in ' r ' leads to a decrease in saving by S_0 (or increase in consumption by an equal amount). It also raises investment by SS_1 . Since $S_0S + SS_1$ was the initial drop in investment. So, there is no change in aggregate demand.

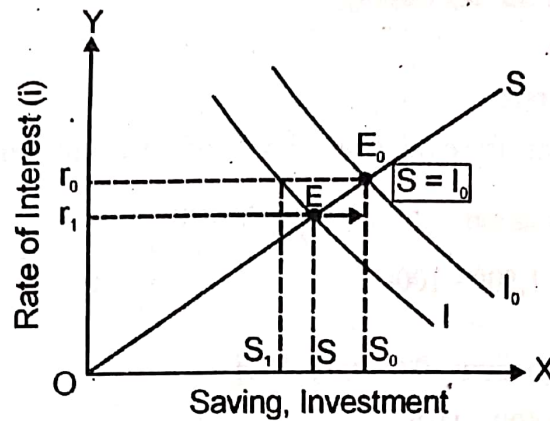


Fig. 5

- (ii) An expansionary monetary policy is more effective, greater the interest sensitivity of investment spending. Explain with the help of a diagram. Also, provide an intuitive explanation.

Ans.: Higher sensitivity of investment spending (b) makes IS flatter. Thus, the change in income is greater, as LM shifts to the right. As money supply (M_s) rises, the rate of interest falls, causing a rise in investment. If the investment is very interest sensitive, even a small fall in the rate of interest leads to a large change in investment and hence a large change in aggregate demand as well as income (Fig. 6).

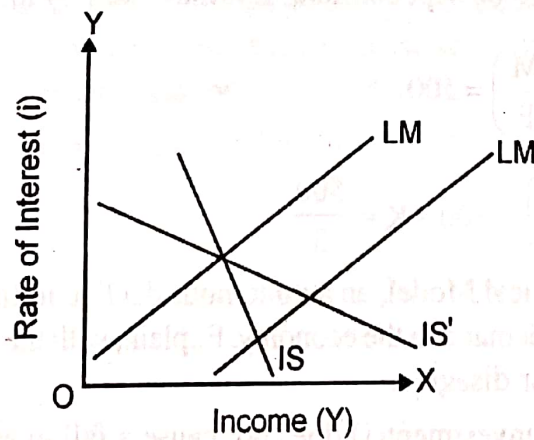


Fig. 6

- (iii) Assume a model of the expenditure sector with no Government or foreign sector. If the savings function is defined as $S = -400 + 0.2Y$, ($Y = \text{income}$) and the autonomous Investment increases by 100, by how much will consumption increase?
(3+5+2)

Ans.: $S = -400 + 0.2Y$

$\Rightarrow C = 400 + (1 - 0.2)Y = 400 + 0.8Y$

$\Rightarrow \Delta C = 0.8 \Delta Y = \frac{0.8}{0.2} \Delta I = \frac{0.8 \times 100}{0.2} = 400$

Introductory Macroeconomics - Generic Economics-II (2016)

Duration : 3 Hours

Maximum Marks : 75

Part (a) is compulsory. Do any 2 out of Parts (b), (c) and (d).

The following data is given for an economy for the period 2014:

- (i) 'X' purchases used car from 'Y' for \$ 20,000 and the dealer charges 2% fee each from 'X' and 'Y'
- (ii) The cost of providing public health is \$ 20 billion
- (iii) Change in inventory investment is \$ 5 billion
- (iv) A pays a market price of \$ 1,00,000 to purchase a newly constructed house in the year 2014
- (v) Government's cost of providing law and order services is \$ 10 billion

Using Product approach to measure GDP, calculate the total contribution of the above economic activities to GDP for the year 2014?

Is government's contribution to GDP is measured at cost? Why or why not? (5)

Ans.: (a) Total contribution to GDP

- | | |
|---|-------------------------------------|
| (i) 4% (2% + 2%) of \$ 20,000 as dealer charges | = \$800 |
| (ii) Cost of public health | = \$ 20 billion |
| (iii) Change in inventory investment | = \$ 5 billion |
| (iv) Market price of new house | = \$ 1,00,000 billion |
| (v) Cost of law and order services | = \$ 10 billion |
| | = 35000100800 |
| | = 35 billion, 100 thousand and 800. |

- (b) Government contribution is measured at cost as there is no market price for most of the goods and services provided by the Government.

Discuss expenditure approach to measure GDP. Why are exports included and imports deducted in this approach? (5)

Section 2.3.3

How is national savings estimated? Explain the uses of private savings. (5)

Section 2.6

- (i) What is real interest rate? Given nominal interest rate of 10%, calculate expected real interest rate, when the expected inflation is 4% and 5%.
- (ii) Compute savings from the following data for an open economy (all figures are in billion dollars):

Investment	100
Exports	50
Imports	40
Net factor payments from abroad	20

(3+2)

Answer:

- (i) Real interest rate (r) is real return to an asset.
 Nominal interest rate (i) is nominal return to an asset
 π_e is expected rate of inflation.
 Real interest rate = $i - \pi^e$
 Expected $r = 10 - 4 = 6\%$
 Expected $r = 10 - 5 = 5\%$
- (ii) Saving = Investment + NX + $NFPFA$
 $= 100 + (50 - 40) + 20$
 $= \$130$ billion

2. Part (a) is compulsory. Do any 3 out of Parts (b), (c), (d) and (e).

(a) The following financial market data is given for an economy:

Currency = 1000; Reserves = 200; and Deposits = 2000

Calculate: (i) the reserve ratio (ii) size of the money multiplier (iii) monetary base and (iv) the money supply.

Ans.:

(i) Reserve ratio = $\frac{R}{D} = \frac{200}{2,000} = \frac{1}{10} = 10\%$

(ii) Size of money multiplier = $\frac{\frac{C}{D} + 1}{\frac{C}{D} + \frac{R}{D}} = \frac{\frac{1,000}{2,000} + 1}{\frac{1,000}{2,000} + \frac{200}{2,000}} = \frac{1.5}{0.6} = 2.5$

(iii) Monetary base = $H = C + R = 1000 + 200 = 1200$

(iv) Money multiplier = $M = C + D = 1000 + 2000 = 3000$

(b) What are the social costs of a steady and predictable inflation? Compare it with unexpected inflation.

Ans.: Section 9.5

(c) (i) Explain the determination of equilibrium interest rate using the demand curve for central bank money and supply of central bank money (exogenously determined) in an economy with only currency (*i.e.*, no checkable deposits). How does a) increase in income and b) money supply affect equilibrium interest rate in this economy?

Ans.: Sections 6.6, 6.7

(ii) The following money demand function is given for an economy:

$$M^d = \$Y (0.35 - i) \text{ and } Y = \$1000$$

Calculate the money demand, when the interest rate is 0.05 (5%), 0.06 (6%) and 0.07 (7%) and plot the corresponding money demand curve. (5+2)

Ans.:

When $i = 0.05$, $M^d = 1,000 (0.35 - 0.05) = 1,000 (0.30) = 300$

When $i = 0.06$, $M^d = 1,000 (0.35 - 0.06) = 290$

When $i = 0.07$, $M^d = 1,000 (0.35 - 0.07) = 280$

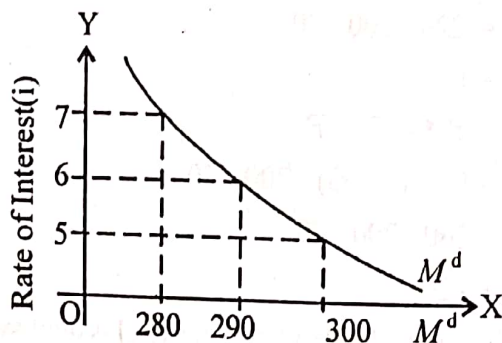


Fig. 7

Money demand curve (M^d) is downward sloping.

- (i) "Financial markets are in equilibrium when overall supply of money is equal to overall money demand". In this context derive money multiplier and show that in equilibrium, the overall supply of money is equal to central bank money times the money multiplier.

Ans.: Section 6.6

- (ii) Suppose the government is running a budget deficit equal to 20% of real income and decides to finance it through seignorage, so $\text{deficit}/Y = \text{Seignorage}/Y = 0.20$. Suppose people hold real balances equal to 2 months of income, so $(M/P)/Y = 2$. What should be the nominal money growth per month? (5+2)

Ans.:

(ii) $S/Y = \Delta M/M \times (M/P)/Y$

$\Rightarrow 0.2 = \Delta M/M \times 2$

($\because S/Y = 0.2$)

$\Rightarrow \Delta M/M = 0.2/2 = 0.10 = 10\%$

- (i) Show that "the need to finance a large deficit through seignorage can lead not only to high inflation but to high and increasing inflation during hyperinflation."

Ans.: Section 9.3

- (ii) What is inflation tax? Can inflation tax be equal to seignorage?

Answer: Section 9.6

Part (a) is compulsory. Do any 3 out of Parts (b), (c) and (d) and (e).

- (i) Distinguish between budget surplus and full employment budget surplus. Which one is a better measure of direction/stance of fiscal policy (*i.e.*, expansionary or contractionary)? Discuss.

Ans.: Sections 11.3.5, 11.3.6

- (ii) Consider the following Keynesian model;

Suppose full employment output (Y^*) = 1,000, actual output (Y) = 1,100, Government purchase of goods and services (G) = 200, Transfers (TR) = 20 and Taxes = 0.20 Y (20%). Compute (a) actual budget surplus and (b) full employment budget surplus.

(3+2)

Ans.:
$$\begin{aligned} \text{Actual } BS &= TA - G - TR \\ &= 0.20(1,100) - 200 - 20 \\ &= 220 - 200 - 20 \\ &= 0 \end{aligned}$$

$$\begin{aligned} FEBS &= tY^* - G - TR \\ &= 0.20(1,000) - 200 - 20 \\ &= 200 - 200 - 20 \\ &= -20 \end{aligned}$$

- (b) (i) Explain how the interest rate works in the classical system to stabilise aggregate demand in the face of autonomous changes in components of aggregate demand such as investment or government spending.

Ans.: Sections 10.2.5

- (ii) Derive IS curve (*i.e.* goods market equilibrium schedule). Explain what determines the slope and position of the IS curve? (Use formal analysis and diagrams). (5+5)

Ans.: Sections 12.1.3, 12.1.4, 12.1.5

- (c) (i) What is crowding out? Discuss with a suitable diagram. Analyse the extent of crowding out in case of: (a) fully employed economies (b) unemployment and (c) unemployment with monetary accommodation of fiscal expansion.

Ans.: Sections 12.7.3

- (ii) Consider the following classical quantity theory of money

$$MV = PY$$

Money supply (M) = 2,000, Velocity of Money (V) = 3 and Output (Y) = 3,000. Derive aggregate demand curve from the above information and plot the price level and output in a diagram. (8+2)

Ans.:
$$MV = PY$$

$$2,000 \times 3 = P \times 3,000$$

$$\Rightarrow P = 2$$

When output is 3,000, P is 2

When output is 2,000, P is 3

When output is 1,500, P is 4

AD curve is obtained as follows:

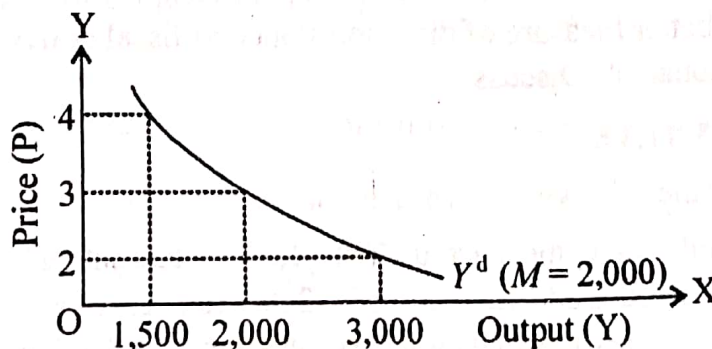


Fig. 8

- (i) Discuss the concept of Liquidity trap. Does monetary policy work in this case? Explain using diagrams.

Ans: Section 12.6.2, 12.6.4

- (ii) Explain the concept of balanced budget multiplier?

Ans: Section 11.3.5

- (iii) Consider the following Keynesian model of income determination;

$$\text{Consumption function } C = 100 + 0.6Y,$$

$$\text{Investment } I = 60.$$

- (a) What is the equilibrium level income?

- (b) If investment increases by 10, what would be the change in equilibrium level of income? (5+3+2)

Ans:

- (a) At equilibrium,

$$Y = C + I = 100 + 0.6Y + 10$$

$$\Rightarrow Y - 0.6Y = 160$$

$$\Rightarrow Y = 160/0.4 = 400$$

- (b) $\Delta Y = K \Delta I = \frac{1}{\text{MPS}} \times \Delta I = \frac{1}{0.4} \times 10 = 25$

- (e) Consider the following IS-LM model of income determination:

Consumption function

$$C = 100 + 0.8Y^d$$

Investment function

$$I = 300 - 50i$$

Government purchases

$$G = 600$$

Tax-function

$$T = 0.25Y$$

Demand for money

$$M^d = 0.20Y - 25i$$

Nominal money supply

$$M^s = 800$$

Price level

$$P = 2$$

(Here, Y^d is disposable Income, ' Y ' is income and i is interest rate)

Answer the following questions

- (i) Write down the equations for the IS and LM curve. Solve the system for equilibrium level of income and interest rate.
- (ii) Derive the values of Fiscal and Monetary Policy Multiplier?
- (iii) Compute the level of investment and budget surplus corresponding to equilibrium level of income?
- (iv) If government purchases are increased by 100, what shall be the change in equilibrium level of income? (4+3+2+1)

Ans:

(e) (i) Goods Market Equilibrium (IS):

$$\boxed{AD = C + I + G}$$

$$Y = 100 + 0.8(Y - 0.25Y) + 300 - 50i + 600$$

$$= 100 + 0.8(0.75Y) + 900 - 50i$$

$$Y = 2500 - 125i \dots \text{IS equation}$$

Money Market Equilibrium (LM):

$$\boxed{M^d = M^s}$$

$$0.20Y - 25i = \frac{800}{2}$$

$$0.20Y = 400 + 25i$$

$$Y = 2000 + 125i \dots \text{LM equation}$$

At equilibrium:

$$2,500 - 125i = 2,000 + 125i$$

$$\Rightarrow i = \frac{500}{250} = 2$$

$$\therefore Y = 2,000 + 125 \times 2 = 2,250$$

$$(ii) FPM = \frac{\alpha_G}{1 + k\alpha_G(b/h)} = 1.25$$

$$MPM = \frac{b\alpha_G}{h + kb\alpha_G} = 2.5$$

$$(iii) I = 300 - 50i = 200$$

$$BS = 0.25(2250) - 600 = -37.5$$

$$(iv) \Delta Y = \Delta G \times 1.25 = 100 \times 1.25 = 125$$

Introductory Macroeconomics - Generic Economics-II (2017)

Duration : 3 Hours

Maximum Marks : 75

Part (a) is compulsory. Do any 2 out of Parts (b), (c) and (d).

Differentiate between intermediate and final goods. Under which category are 'Capital Goods' included? (5)

Ans.: Section 2.4.1; Capital goods are included in the final goods as these are not used in the same period in which such goods are produced. But, these are used to produce other goods. Such goods, like the case of inventories are included in GDP.

Why are goods and services included in GDP at their market values? Are there any disadvantages in using market values to measure production? Discuss briefly. (5)

Ans.: The goods and services are included in GDP at their market value because:

- (i) It allows adding the production of different goods and services
- (ii) It takes into account differences in the relative economic importance of different goods services.

Disadvantages of using market value to measure production are:

- (i) Some useful goods and services are not sold in formal market. Hence, they are ignored.
- (ii) Underground economy.
- (iii) Government services are not included at market value.

(i) Define 'Private Savings'. How are they used in the economy? (3)

Ans.: Section 2.7

(ii) In an economy, 'Private Savings' is 1065, Investment = 1346 and the Current Account Balance is negative (-220). How much is Government saving in this economy? (2)

Given $S_{\text{pvt}} = 1,065$

$$I = 1,346$$

$$CA = (-220)$$

$$S = S_{\text{pvt.}} + S_{\text{govt.}}$$

$$1,126 = 1,065 + S_{\text{govt.}} \quad (\because S = I + CA = 1,346 - 220 = 1,126)$$

$$S_{\text{govt.}} = 1,126 - 1,065 = 61$$

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Ans.: The goods and services are included in GDP at their market value because:

- It allows adding the production of different goods and services.
- It takes into account differences in the relative economic importance of different goods services.

Disadvantages of using market value to measure production are:

- Some useful goods and services are not sold in formal market. Hence, they are ignored.
- Underground economy.
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(i) Define 'Private Savings'. How are they used in the economy? (3)

Ans.: Section 2.7

(ii) In an economy, 'Private Savings' is 1065, Investment = 1346 and the Current Account Balance is negative (-220). How much is Government saving in this economy? (2)

Given $S_{\text{pvt}} = 1,065$

$$I = 1,346$$

$$CA = (-220)$$

$$S = S_{\text{pvt}} + S_{\text{govt}}$$

$$1,126 = 1,065 + S_{\text{govt}} \quad (\because S = I + CA = 1,346 - 220 = 1,126)$$

$$\Rightarrow S_{\text{govt}} = 1,126 - 1,065 = 61$$

- (d) (i) What are 'Official Reserve Transactions' in the 'Balance of Payments' of a country? (3)

Ans.: Section 3.3.2

- (ii) A firm makes and sells jam using fruit it buys from another firm for ₹ 80,000. It pays its workers ₹ 50,000; pays ₹ 20,000 in taxes and has profits of ₹ 40,000. What is its value added? (1)

Ans.: Given, Fruits bought by other firm	= ₹ 80,000
Wages paid to workers	= ₹ 50,000
Taxes paid	= ₹ 20,000
Profit	= ₹ 40,000

Profit = Sales revenue - Wages Paid - Taxes - Intermediate Consumption

$$\Rightarrow 40,000 = \text{Sales Revenue} - 50,000 - 20,000 - 80,000$$

$$\Rightarrow \text{Sales Revenue} = 40,000 + 50,000 + 20,000 + 80,000 = 1,90,000$$

$$\therefore \text{Value Added} = \text{Sales} - \text{Intermediate Consumption}$$

$$= 1,90,000 - 80,000 = ₹1,10,000$$

- (iii) A factory owner purchased 5 new machines at ₹ 30,000 each. He sold his old ones for ₹ 60,000. What is the net impact of these transactions on GDP? (1)

Ans.: Net impact on GDP = $5 \times 30,000 = ₹ 1,50,000$

Sales of old machines will not be included.

2. Part (a) is Compulsory. Do any *three* out of Parts (b), (c), (d) and (e).

- (a) (i) What is meant by 'debt monetization'? (2)

Ans.: Section 9.6.2

- (ii) What is the effect of an increase in expected inflation on demand for real money balances? (2)

Ans.: Section 9.3

- (b) (i) Use the market for Central Bank Money to graphically illustrate and briefly explain the effects of an Open Market sale of bonds by the Central Bank on the equilibrium interest rate. (4)

Ans.: Section 7.3.1

- (ii) Define transactions velocity of money. Also, calculate it if the current value of transactions in a year is ₹ 1500 crores and the money stock is 75 crores. (4)

Ans.: Section 5.3.1

Given $PT = ₹1,500$ crores

$M = ₹75$ crores

$MV = PT$

$$V = \frac{PT}{M} = \frac{1,500}{75} = 20$$

- (i) Assume, all money is held in the form of currency, and that Central Bank Money is initially ₹ 200 crores. If it pursues an expansionary Open Market Operation worth ₹ 10 crores, what will be its impact on its balance sheet and the money demand and the money supply curves? (4)

s.: Given, $H = ₹200$ cr.

Expansionary open market operations = ₹10 cr.

$c = 1$

$$\text{Money multiplier} = \frac{1}{c + \theta(1-c)} = \frac{1}{c+0} = \frac{1}{1} = 1$$

$$H = [c + \theta(1-c)] \cdot YL(i)$$

= Money multiplier • demand for money

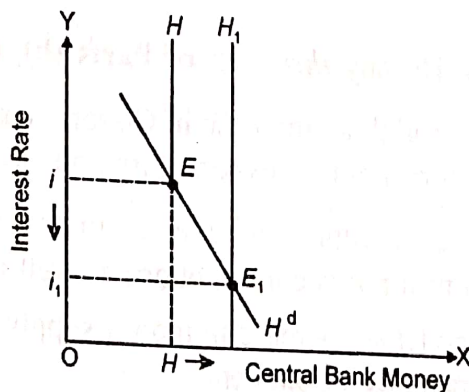
⇒ $210 = 1 \cdot M^d$

⇒ $M^d = 210$

The assets of central banks are the bonds it hold in its portfolio and the liabilities are the stock of money in the economy. If the central bank pursues an expansionary open market operations worth ₹10 crores, the amount of bonds it holds is raised by ₹10 crores and so is the amount of money in the economy, i.e., the balance sheet will look like:

Assets	Liabilities
Change in bond holdings: ₹10 crores	Change in money stock: ₹10 crores

The money supply curve will shift to right by ₹10 crores. Equilibrium interest rate will fall to Oi_1 .



- (ii) Discuss the Cambridge version of the 'Quantity Theory of Money'. When is it equivalent to the Fisher's version? (3)

Ans.: Section 5.4

- (d) (i) Assume that all individuals do not hold currency and that the reserve ratio (R/D) is 0.25. Also, assume that the monetary base equals ₹ 300 crore. Calculate the amount of: (4)
- (1) Reserves
 - (2) Checkable deposits
 - (3) The money supply
 - (4) The money multiplier.

Ans.: Given, reserve ratio (R/D) = 0.25 = θ , $C = 0$, $H = 300$

1. $H = C + R$

Reserves (R) = $H - C = 300 - 0 = 300$

2. Checkable deposits = $300 \times 4 = 1,200$

3. Money supply = $300 \times 4 = 1,200$

4. Money multiplier (m) = $\frac{1}{c + \theta(1-c)} = \frac{1}{0 + 0.25(1-0)} = \frac{1}{0.25} = 4$

- (ii) Briefly explain, what happens to the money multiplier when there is an increase in the proportion of money people want to hold in currency. (3)

Ans.: Section 7.4

- (e) Derive an algebraic expression for the demand for Central Bank money in terms of the parameters c (ratio of currency to money demand) and θ (reserve deposit ratio). Graphically illustrate the equilibrium in the market for Central Bank money. How would the equilibrium interest rate change if the demand for Central Bank money increases? (7)

Ans.: Sections 7.3, 7.3.2

3. Part (a) is Compulsory. Do any *three* out of Parts (b), (c), (d) and (e).

- (a) (i) In the Keynesian model, an increase in Government spending leads to an increase in both consumption expenditure and savings. Comment. (5)

Ans.: Section 11.4.4; Through multiplier effect a rise in government spending raises income, which in turn raises consumptions as well as saving.

- (ii) In the Classical model an increase in money supply leads to an increase in real output and price level. Comment. (5)

Ans.: Section 10.2.7, No, an increase in money supply shifts the AD curve to the right raising price with no change in the price level on account of vertical LRAS curve.

- (i) Illustrate, graphically, the determination of interest rate in the classical system. Explain what happens when there is a drop in autonomous investment demand. Does it reduce the overall demand in the economy? (5)

Ans.: Sections 10.2.4, 10.2.6

- (ii) For a simple model of the expenditure sector with Government and income taxes, derive the expenditure multiplier and explain how it changes as the marginal propensity to save increases. (5)

Ans.: Section 11.4.4

- (i) What are 'automatic stabilizers'? Give example. (3)

Ans.: Section 8.9

- (ii) In a simple expenditure model, if total autonomous spending, \bar{A} is 800, the marginal propensity to save is 0.2 and the marginal tax rate t is 0.25, what is the equilibrium level of income? (4)

Ans.: Given

$$\bar{A} = 800, \quad t = 0.25 \text{ and } MPS = 0.2$$

Or, $MPC = c = 1 - MPS = 1 - 0.2 = 0.8$

$$Y = \bar{A} \cdot \frac{1}{1 - c(1 - t)}$$

$$= 800 \cdot \frac{1}{1 - 0.8(1 - 0.25)}$$

$$= 800 \cdot \frac{1}{1 - 0.8(0.75)}$$

$$= 800 \cdot \frac{1}{1 - 0.60}$$

$$= 800 \cdot \frac{1}{0.40}$$

$$= 800 \cdot 2.5 = 2,000$$

- (iii) Define IS curve. How would you describe points above and below the IS curve? (4)

Ans.: Sections 12.2.3, 12.2.6

- (i) Explain with the help of an IS-LM diagram, the impact of an increase in the supply of money on the level of income and interest rate. (4)

Ans.: Section 12.6

(ii) Assume the following IS-LM model: (6)

Goods Market:

$$\text{Consumption } (C) = 100 + \frac{4}{5} YD$$

$$\text{Investment } (I) = 300 - 40i$$

$$\text{Government purchases } (G) = 120$$

$$\text{Taxes } (TA) = 1/4 Y$$

$$\text{Net Exports } (NX) = (-20)$$

where YD is disposable income

Money Market:

$$\text{Real money supply } (M/P) = 250$$

$$\text{Money demand } (M^d) = 1/4 Y - 100i$$

(1) Derive the equations of the IS and LM curves.

(2) Determine the equilibrium levels of income (Y) interest rate i .

(3) What are the levels of consumption (C) and money demand (M^d) corresponding to equilibrium level of income?

Ans.:

1. IS Equation:

$$Y = C + I + G + NX$$

$$\text{Or, } Y = 100 + 0.80(Y - 0.25Y) - 120 - 20 + 300 - 40i$$

$$= 500 + 0.60 Y - 40i$$

$$\Rightarrow 0.40Y = 500 - 40i$$

$$\Rightarrow Y = 1250 - 100i$$

LM Equation:

$$\frac{M}{P} = M^d$$

$$\frac{M}{P} = 0.25 Y - 100i$$

$$250 = 0.25 Y - 100i$$

$$\Rightarrow Y = 1000 + 400i$$

Equilibrium level of Income (Y) and Interest rate (i) occurs where:

$$IS = LM$$

$$1,250 - 100i = 1,000 + 400i$$

$$1,250 - 1,000 = 400i + 100i$$

$$250 = 500i$$

$$i = \frac{250}{500} = 0.50$$

$$Y = 1,250 - 100 \times 0.50$$

$$= 1,250 - 50 = 1200$$

Level of Consumption (C) and Money Demand (M^d) corresponding to equilibrium level of Income (Y) is:

$$Y = 1200, i = 0.50$$

$$\text{Consumption } (C) = 100 + 0.80 (1,200 - 0.25 \times 1200)$$

$$= 100 + 0.80 (900) = 100 + 720 = 820$$

$$\text{Money Demand } (M^d) = 0.25Y - 100i$$

$$= 0.25 \times 1,200 - 100 \times 0.50 = 300 - 50 = 250$$

- e) (i) Explain how output and employment are determined within the classical macroeconomic model. Also discuss the impact of an increase in women participation in workforce on real wages, output and employment. (5)

Ans.: Section 10.2.3 (2)

- (ii) Suppose, we have an economy described by the following equations:

$$\text{Consumption Expenditure, } C = 50 + \frac{4}{5} YD$$

$$\text{Investment Expenditure, } I = 70$$

$$\text{Government Expenditure, } G = 200$$

$$\text{Transfer Payments, } TR = 100$$

$$\text{Tax rate, } t = 0.20$$

Where YD is disposable income.

Calculate the equilibrium level of income and the budget surplus. (5)

Ans.: IS Equation:

$$Y = C + I + G = 50 + \frac{4}{5}Y_d + 70 + 200$$

$$= 320 + \frac{4}{5}(Y - tY + TR)$$

$$= 320 + \frac{4}{5}(Y - 0.2Y + 100)$$

$$= 320 + \frac{4}{5} \times (0.8Y + 100)$$

$$= 320 + 0.64Y + 80$$

$$= 400 + 0.64Y$$

$$\Rightarrow Y - 0.64Y = 400$$

$$\Rightarrow Y = \frac{400}{0.36} = \frac{10,000}{9}$$

$$BS = tY - G - TR$$

$$= 0.2 \left(\frac{10,000}{9} \right) - 200 - 100$$

$$= 320 + 0.64Y + 80 = 400 + 0.64Y$$

$$\Rightarrow Y - 0.64Y = 400$$

$$\Rightarrow Y = \frac{400}{0.36} = \frac{10,000}{9}$$

$$BS = tY - G - TR$$

$$= 0.2 \left(\frac{10,000}{9} \right) - 200 - 100$$

$$= \frac{2,000}{9} - 300 = \frac{-700}{9} = -77.78$$