

2023

**ECONOMICS — HONOURS**

**Paper : CC-3**

**(Introductory Macroeconomics)**

**Full Marks : 65**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

**Section - A**

1. Answer *any ten* questions :

2×10

- (a) What is the difference between NNP at market price and NNP at factor cost?
- (b) Define GDP deflator.
- (c) Define liquidity trap.
- (d) Why is the equilibrium in SKM not stable if  $MPC > 1$ ?
- (e) If  $C = 100 + 0.8Y$ , derive the savings function where  $C =$  Consumption and  $Y =$  National Income.
- (f) Explain neutrality of money.
- (g) Mention any two factors that determine velocity of money.
- (h) What is the difference between Transaction demand and Speculative demand for money?
- (i) What do you understand by the term 'Says Law'?
- (j) State the main properties of Keynesian savings function.
- (k) Define Personal disposable income.
- (l) What is the relationship between bond price and rate of interest?
- (m) State whether the statement is true or false with reason —  
"The value of goods produced by a British Company in the domestic boundary of India is a part of Indian GNP".
- (n) Explain, in brief, the concept of 'Keynesian Cross'.
- (o) What is Paradox of Thrift?

**Please Turn Over**

## Section - B

2. Answer *any three* questions :

- (a) Assume that GDP = ₹ 6,000, personal disposable income = ₹ 5,100, government budget deficit = ₹ 200, consumption = ₹ 3,800 and trade deficit (M - X) = ₹ 100.
- (i) How large is savings?  
 (ii) What is the size of investment?  
 (iii) How large is government expenditure?  
 (iv) Show that a country that spends more than its income must have an external deficit. 1+1+1+2
- (b) Explain Quantity Theory of Money. 5
- (c) In a two-sector closed economy explain in brief the circular flow of Income. If you consider a two-sector open economy, how does the circular flow of income change? 5
- (d) Explain, in brief, lumpsum tax multiplier in the Simple Keynesian model. 5
- (e) Explain, in brief, the concept of Keynesian Liquidity Preference Schedule. 5

## Section - C

Answer *any three* questions.

3. Explain the impact of —
- (a) Increase in money supply  
 (b) Increase in supply of labour  
 on income, employment price and money wage in the classical mode. 5+5
4. Explain how the interaction of the multiplier and accelerator is capable of generating cyclical fluctuations endogenously. 10
5. (a) Determine Government Expenditure Multiplier—
- (i) when tax is lumpsum  
 (ii) when tax is a function of income.
- (b) If in a two-sector economy autonomous consumption is given by ₹ 80 crores, equilibrium income is given by ₹ 525 crores, autonomous investment is ₹ 25 crores, find the marginal propensity to consume. (3+4)+3
6. (a) Explain the effects of changes in tax and government purchases on budget surplus.  
 (b) Explain, in detail, the derivation of Balanced Budget Multiplier in the Simple Keynesian model. 5+5
7. (a) With an example, explain the 'Value Added Method' of income determination.  
 (b) Explain, in detail, the expenditure method of national income calculation. 5+5

2023

## ECONOMICS — HONOURS

Paper : CC-4

(Mathematical Methods in Economics-II)

Full Marks : 65

*The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.*

## Group - A

1. Answer *any ten* questions :

2×10

- (a) Verify the Young's rule for the function  $F(X, Y) = 5X^4 + 3X^2Y + Y^2$ .
- (b) Examine whether the property of diminishing marginal utility holds for good X for the utility function  $U = \log x + y$ .
- (c) Find the marginal product functions for the production function
- $$f(x_1, x_2) = Ax_1^\alpha x_2^\beta, A > 0, 0 < \alpha, \beta < 1 \text{ and } x_1, x_2 > 0.$$
- (d) Examine the convexity / concavity of the following function :
- $$F(x_1, x_2) = 6x_1 - 9x_2, x_1, x_2 > 0.$$
- (e) Is the following function homothetic? Give reason for your answer.

$$z = \frac{x^2 y^2}{xy + 1}$$

- (f) Find the own price, cross-price and income elasticities of demand for the following demand function :  $Q_1^d = \frac{M}{2P_1}$ .
- (g) Find the degree of homogeneity of the function  $F(X_1, X_2) = X_1^{1/4} X_2$ .
- (h) What is a level curve? Mention one example of its use in economics.
- (i) For the utility function  $U(x_1, x_2) = x_1^2 x_2$ , show that the marginal rate of substitution is increasing in  $x_2$  and decreasing in  $x_1$ .
- (j) In a two-commodity market, show that  $w_1 e_{1M} + w_2 e_{2M} = 1$ ,  $e_{1M}$  and  $e_{2M}$  are the income elasticities of the two goods, and  $w_1$  and  $w_2$  are their income shares respectively.
- (k) Using economic examples briefly clarify what you mean by unconstrained and constrained optimization problems.

Please Turn Over

- (l) If  $V = \frac{M^2}{4P_2P_1}$  be the indirect utility function, find the ordinary demand function for good 1.
- (m) A firm produces two goods, viz., A and B. It has two factories that jointly produce the two goods (per hour) in the following quantities :

	Factory 1	Factory 2
Good A	10	20
Good B	25	25

The firm receives an order for 300 units of A and 500 units of B. The costs of operating the two factories are ₹ 10,000 and ₹ 8,000 per hour, respectively. If  $x$  and  $y$  respectively denote the number of hours for which the two factories are used, write down the LPP of minimization of cost fulfilling the order.

- (n) Find the fixed point(s) and determine whether the fixed point(s) is (are) stable or unstable for the following function :

$$\dot{x} = f(x) = x^2 - 1.$$

- (o) What is meant by the time path of a variable? Draw the graph of a continuous variable that is convergent towards its equilibrium value.

**Group - B**

Answer **any three** questions.

- For the function  $f(x_1, x_2) = x_1^4 x_2$ , verify the Euler's Theorem. 5
- Show that diminishing marginal utility cannot ensure the convexity of indifference curves. 5
- Using the Envelope Theorem, derive the Roy's Identity for good 1 in a two-commodity model. 5
- Find the compensated demand functions for the expenditure function  $E = 2\sqrt{p_1 p_2} \bar{u}$ . 5
- Solve the difference equation :  
 $y_{t+1} + 3y_t = 4, y_0 = 4.$   
 Calculate the value of  $y_5$ . 4+1

**Group - C**

Answer **any three** questions.

- (a) Show that the function  $f(x_1, x_2) = Ax_1^\alpha x_2^\beta, A > 0, \alpha, \beta > 0$  is quasi-concave. Also, show that it is concave only if  $\alpha + \beta \leq 1$ .
- (b) What is the equation of the indifference curve if the utility function is  $U = X_1^2 X_2^2$ ? Find the slope and curvature of the indifference curve to determine its shape and sketch the curve. (5+1)+(1½+1½+1)

8. (a) Given that the utility function of a consumer  $u = (x + 2)(y + 1)$  and  $p_x = ₹ 2$  and  $p_y = ₹ 5, M = ₹ 51$ , find the optimal levels of purchases of  $x$  and  $y$ . What will be the amounts of optimal purchases if there is a change in prices of goods  $X$  and  $Y$  to ₹ 4 and ₹ 10 respectively and the income of the consumer changes to ₹ 102?

- (b) Consider the following macro model :

$$I(r) + X_0 = S(y, r) + M(y), I_r < 0, S_y > 0, S_r > 0, M_y > 0, L(y, r) = M^s, L_y > 0, L_r < 0$$

where  $I, S, M$  and  $L$  are the investment, saving, import and money demand functions respectively, and  $r, y$  and  $M^s$  are the interest rate, income and given supply of money respectively and  $X_0$  is given level of exports. Examine the comparative static effects of changes in money supply. (6+1)+3

9. (a) Find the stationary point(s) of the function  $f(x, y) = \log(1 + x^2 y)$ , and classify it (them).

- (b) Consider the market :

$$Q_d^t = 36 - 10p_t, Q_s^t = -2 + 9p_{t-1}, p_0 = 1.$$

Determine the intertemporal equilibrium price. Find the time path of price and analyse it. 6+4

10. (a) Solve :  $\frac{dY}{dt} + 3Y = 2, Y(0) = 4.$

- (b) Solve the following LPP :

$$\text{Max } 4x + y \text{ sub to } x + 2y \leq 5, 3x + 2y \leq 6, x, y \geq 0.$$

4+6

11. (a) Let the demand and supply functions be

$$Q_d = 42 - 4P - 4P' + P''$$

$$Q_s = -6 + 8P$$

with initial conditions  $P(0) = 6$  and  $P'(0) = 4$ . Assuming market clearance at every point of time, find the time path  $P(t)$ .

- (b) For the following differential equation system, determine whether the system is a stable or unstable node, saddle point, stable or unstable focus, or centre :

$$\frac{dx}{dt} = 10x + 3y + 2$$

$$\frac{dy}{dt} = -3x + y + 1$$

6+4