

2020

ECONOMICS — HONOURS

Seventh Paper

(Group - B)

Full Marks : 50

The figures in the margin indicate full marks.

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

[Students will attempt either Option : A or Option : B]

Option : A

(Application of Economics to Managerial Issues)

Section - A

1. Answer *any four* questions :

- (a) With the help of an example define opportunity cost. How is it different from accounting cost? 3+2
- (b) What is the most common valuation model used by firms? 5
- (c) How is cost elasticity related to economies of scale? 5
- (d) A firm produces 5000 units of commodity X at total fixed cost of ₹ 20,000 and total variable cost of ₹ 30,000. Find the price which the firm would charge from its customers if it wants to make a net profit margin of 15% on cost. The firm uses cost plus pricing method. 5
- (e) What are the main advantages of marginal cost pricing? When is it best applied? 2½+2½
- (f) Briefly describe the broad categories of capital budgeting. 5
- (g) Does an accumulation of 'anticipation inventory' indicate a wrong estimation of demand? Explain. 2+3
- (h) What is profitability index? Which is superior ranking criterion – Profitability index or the Net Present Value? 2½+2½

Section - B

Answer *any two* questions.

2. Describe the effects of the following decisions on the value of a firm :

- (a) The bank interest is reduced drastically.
- (b) Increase in advertisement expenditure following a fall in sales. 7½+7½

Please Turn Over

3. (a) What is profit-volume analysis?
 (b) Golden Airline has the monthly seating capacity of 20,000 passengers on one of its routes at a fare of ₹ 170. Variable cost is ₹ 20 per passenger and fixed cost is ₹ 6,00,000. Find
 (i) Break-even quantity
 (ii) Break-even sales
 (iii) Break-even percentage of capacity
 (iv) Suppose the management sets a profit target of the route at ₹ 4,00,000. What would be the required profit before tax to achieve this profit target (tax rate = 46%)? 5+10
4. “A firm may resort to ‘satisfying behaviour’ if necessary.” Explain the justification of the statement. 15
5. Rank the following investment proposals in order of their profitability according to :
 (a) Payback method
 (b) Rate of return method
 (c) Present value index method
 (cost of capital : 10 per cent)

| Project No | Initial Outlay (₹) | Annual Cash flow (₹) | Life in years |
|------------|--------------------|----------------------|---------------|
| A | 25,000 | 3,000 | 10 |
| B | 3,000 | 1,000 | 5 |
| C | 12,000 | 2,000 | 8 |
| D | 20,000 | 4,000 | 10 |
| E | 40,000 | 8,000 | 12 |

5+5+5

6. What is meant by product life cycle? Can there be variation in price policy in different stages of product life cycle? Why? 6+3+6
7. (a) Explain Capital Asset Pricing Model (CAPM) of calculating cost of equity.
 (b) Suppose in a market the average return on common stock is 10 percent, while the return on government bond is 6 per cent. Find out the cost of capital using CAPM if
 (i) risk associated with the firm in question $\beta = 1$
 (ii) $\beta = 0.5$ 10+5
8. (a) What is Economic Order Quantity (EOQ)?
 (b) Company XYZ faces an annual demand of 5,40,000 units. The purchase price of stock is ₹ 24 per thousand units, with a cost of ordering of ₹ 4. The cost of holding stock is 20 per cent of average stock value. Find the optimum order quantity and minimum acquisition cost. 5+10
9. “Institutional investors should be involved in the corporate governance of a firm.” Do you agree with the statement? Justify your answer. 3+12

Option : B**(Mathematical Economics)****Section - A**Answer *any two* questions.

1. An individual is interested to optimise his utility $U = x_1^{0.25} x_2^{0.75}$

His income is ₹ 100, per unit prices of x_1 and x_2 are ₹ 2, and ₹ 4 respectively. What should be his optimal choice? 10

2. In a two commodity world, show that the weighted sum of the income elasticities of the goods equals 1. 10

3. Can there be a two person zero sum game which has a value zero? If so, write down the pay-off matrix of one such game. 10

4. Find out the equilibrium prices for the following two sector static Leontief open input-output model : 10

| | |
|-----|-----|
| 0.3 | 0.3 |
| 0.2 | 0.5 |

and $(a_{01}, a_{02}) = (4, 6), w = 10$.

5. An individual has two investment opportunities. Each involving an outlay of ₹ 10,000. The possible earnings from each investment and their respective probabilities are given in the following table :

| | Investment I | | Investment II | | |
|---------------|--------------|-------|---------------|-------|-------|
| Earnings (₹) | 4,000 | 6,000 | 3,000 | 5,000 | 7,000 |
| Probabilities | 0.6 | 0.4 | 0.4 | 0.3 | 0.3 |

(a) Calculate the expected earnings of each investment.

(b) Determine which of the two investments the individual should choose. 5+5

6. Consider the output system of the following two-sector general equilibrium model :

$$\begin{aligned} a_{L_1}X_1 + a_{L_2}X_2 &= L \\ a_{K_1}X_1 + a_{K_2}X_2 &= K \end{aligned}$$

where a_{L_i} and a_{K_i} are the amount of labour and capital respectively to produce one unit of the i -th commodity, $i = 1, 2$. With the help of Cramer's Rule, show that an increase in the endowment of a factor raises the production of the commodity that uses the factor intensively. 10

7. Set up a first-order differential equation to show that the rate of growth of capital - labour ratio depends on marginal propensity to save and rate of growth of labour. 10

Please Turn Over

8. The total cost function of a firm is $C = 2q^3 - 3q^2 + 12q$. Show that at the minimum point of the AC curve the average cost equals the marginal cost. 10

Section - B

Answer *any two* questions.

9. Consider the indirect utility function : $v(p_1, p_2, m) = \left(\frac{m}{p_1 + p_2} \right)$. What are the demand functions?

What is the direct utility function?

7½+7½

10. In a model of profit maximizing monopoly with tax, take the functions

$$p = 100 - q, C = 0.5q^2$$

and with $t = ₹ 1$ initially, and then $t = ₹ 2$, solve for profit maximizing outputs in each case and compare them with economic interpretation. 15

11. For the following differential equations, draw a phase diagram, identify every steady state and for each steady state, say whether it is stable or unstable –

(a) $\left(\frac{dx_t}{dt} \right) = 2.5x_t + 40$

(b) $\left(\frac{dx_t}{dt} \right) = 10 - x_t^{0.5}$

7½+7½

12. Solve the following problems :

(a) Show that the function $u(w) = \frac{w^{(1-\alpha)}}{(1-\alpha)}$ has a constant coefficient of relative risk aversion.

(b) Does the function, $u(w) = aw - bw^2$, ($a, b > 0$), exhibit increasing or decreasing risk aversion? 7½+7½

13. Solve the following solution :

$$y_{t+2} - 2y_{t+1} + 2y_t = 1; (y_0 = 3; y_1 = 4)$$

Comment on the stability of the path.

9+6

14. Countries 1 and 2 trade with each other, under fixed exchange rates. The relevant functions are

| | Country 1 | Country 2 |
|----------------------|------------------|------------------|
| Consumption Function | $C_1 = 0.8 Y_1$ | $C_2 = 0.7 Y_2$ |
| Investment | $I_1 = I_1^0$ | $I_2 = I_2^0$ |
| Imports | $Q_1 = 0.3 Y_1$ | $Q_2 = 0.5 Y_2$ |

Assuming that one country's imports are the other country's exports, find the effects of a change in each country's exogenous investment on the equilibrium income levels in both countries. 15

15. Consider the following game :

| | | | |
|----------------|---|----------------|----------------|
| | B | | |
| A | | B ₁ | B ₂ |
| A ₁ | | 4, 4 | 1, 4 |
| A ₂ | | 4, 1 | 0, 0 |

(a) Does the game have a dominant strategy for A and B? If so, state the dominant strategies.

(b) Does the game have any pure strategy Nash Equilibrium? If so, what are they?

(c) Does the game have any mixed strategy Nash Equilibrium? If so, what are they? 6+6+3

16. Consider the following problem :

$$\text{Minimize } C = rK + wL$$

$$S.t \ K^{1/2} L^{1/2} = Q_0$$

Let $C^* = C(v, w, Q_0)$ denote the value function for this problem. Show that

$$\frac{\partial C^*}{\partial r} = K, \quad \frac{\partial C^*}{\partial w} = L, \quad \text{and} \quad \frac{\partial C^*}{\partial Q_0} = \lambda$$

where λ is the Lagrangian Multiplier.