

2020

ECONOMICS — HONOURS**Paper : CC-5****(Intermediate Microeconomics – I)****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**

- The Government passes a law that allows a substantial subsidy for every hectare of land used to grow sugarcane. How does this programme affect the long-run supply curve for sugarcane?
- Each extra worker produces an extra unit of output up to six workers. After six no additional output is produced. Draw the Total Product and Marginal Product Curves.
- Define short-run in the context of production.
- Why are the isocost lines straight lines?
- What would be the shape of the expansion path when the production function is given by $Q = 2^{0.5} K^{0.5} L^{0.5}$, $W = ₹ 50$ a day and $r = ₹ 100$ per day?
- What do you mean by economic rent?
- State the range between which the marginal rate of technical substitution vary as we move along a L-shaped isoquant.— Why?
- Mention how an individual's labour supply might change with the receipt of a substantial amount of outside income?
- Swagota is deciding whether to buy a lottery ticket. Each ticket costs ₹ 10, and the probability of winning pay-offs is given as follows :

| Probability | Return |
|-------------|--------|
| 0.5 | ₹ 0 |
| 0.25 | ₹ 10 |
| 0.2 | ₹ 20 |
| 0.05 | ₹ 75 |

What is the expected value of Swagota's pay-off if she purchases a lottery ticket?

Please Turn Over

- (j) Under a perfectly competitive structure, suppose MP_L is 5 units per hour and each unit is sold in the market at ₹ 6. The firm owner has to pay ₹ 40 per hour to the worker. Explain whether the owner will hire the worker.
- (k) How can you relate a risk-lover with a fair gamble?
- (l) The Utility function of Debasis is $U = C_1 C_2$. His income and prices of the commodities in two periods are as follows :

| Period | Income | Price of C_1 | Price of C_2 |
|--------|--------|----------------|----------------|
| 1 | 200 | 20 | 20 |
| 2 | 200 | 20 | 50 |

Calculate the Laspeyre's index.

- (m) Determine the marginal rate of technical substitutions of Upper and Lower Ridge lines.
- (n) 'In stage-2 of the production process, the marginal productivity of both fixed and variable factor is positive.'— Justify the statement.
- (o) Study the following table and determine the amount of labour which should be employed for maximisation of profit.

| Units of labour | Total Product | Price (₹) | Remuneration of labour (₹) |
|-----------------|---------------|-----------|----------------------------|
| 1 | 40 | 10 | 300 |
| 2 | 75 | 10 | 300 |
| 3 | 105 | 10 | 300 |
| 4 | 125 | 10 | 300 |

Group - B

2. Answer *any three* questions :

- (a) 2 pens and 4 pencils are bought when prices of pens and pencils are ₹ 2 and ₹ 4 respectively. When price of pens rises to ₹ 4 and price of pencils fall to ₹ 2, the quantities of pens and pencils bought are 4 pens and 2 pencils. Do these observations indicate violation of Weak Axiom of Revealed Preference Theory? 5
- (b) (i) In the short-run a firm cannot vary its capital $K = 2$, but can vary its labour L . It produces output q . Explain why the firm will not experience diminishing marginal returns to labour in the short-run, if its production function is $q = 10L + K$.
- (ii) Can you think of a situation in which short-run marginal cost (SRMC) is less than the long-run marginal cost (LRMC)? 2+3
- (c) A consumer survives for just two time periods 1 and 2. The consumer gets income M_1 and M_2 in the two periods and consumes C_1 and C_2 . The consumer can reallocate consumption between the two periods by saving and borrowing at the market rate of interest i . If both C_1 and C_2 are normal goods and the second period's income (M_2) falls, then in which direction will the budget line shift?— Why? 5

- (d) (i) Under a perfectly competitive scenario $q = 10 + 5L$ and $P = 6$, where q = level of output, P = price and L = labour employed. Find the equilibrium wage.
 (ii) The magnitude of economic rent depends on the elasticity of supply of the factor input.— Explain. 2+3
- (e) When two commodity baskets are purchased by the consumer at two different points of time, explain how price weighted quantity indices may be used to verify the Weak Axiom of Revealed Preference. 5

Group - C

Answer *any three* questions.

3. (a) Suppose Natasha's utility function is given by $u(I) = \sqrt{10I}$, where I represents annual income in thousand of rupees.
 (i) Is Natasha risk-loving, risk-neutral or risk-averse?
 (ii) Suppose that Natasha is currently earning an income of ₹ 40,000 ($I = 40$) and can earn that income next year with certainty. She is offered a chance to take a new job that offers a 0.6 probability of earning ₹ 44,000 and 0.4 probability of earning ₹ 33,000. Should she take the new job?— Why? 2+(1+3)
- (b) (i) What do you mean by risk premium?
 (ii) Irma is risk-averse. She gets an expected utility of 105 utils from a lottery with expected income of ₹ 4,000. However she gets an utility of 105 utils from a certain wealth of ₹ 2,600 only. Calculate her risk premium. 2+2
4. (a) A firm has a fixed production cost of ₹ 5,000 and a constant marginal cost of production of ₹ 500 per unit produced.
 (i) What is the firm's Total Cost (TC) function? What is its Average Cost (AC) function?
 (ii) Suppose the firm must pay an annual tax which is a fixed sum, independent of whether it produces any output. How does this tax affect the firm's Total Cost (TC), Marginal Cost (MC) and Average Cost (AC)? 5
- (b) A sales tax of ₹ 1 per unit of output is placed on a particular firm whose product sells for ₹ 5 in a competitive industry with many firms.
 (i) How will the tax affect the cost curves for the firm?
 (ii) What will happen to firm's price, output and profit? 5
5. (a) A competitive firm finds that at equilibrium level of output its $AR = 20$, $MC = 20$ and $AC = 60$ while $AVC = 16$. Will the firm produce or shut down? At what level of price will it shut down?
 (b) 'The perfect competition may come to an end if the production function is characterised by increasing returns to scale.'— Justify the statement. (4+2)+4

Please Turn Over

6. (a) Discuss the effects of changes in income and real interest upon a consumer's intertemporal consumption pattern.
- (b) The demand for labour of an industry is given by the curve $L = 1200 - 10W$, where L is the labour demanded per day and W is the wage rate. The labour supply curve is given by $L = 20W$.
- What is the equilibrium wage rate and quantity of labour hired? What is the economic rent earned by the workers? 6+(2+2)
7. (a) Explain the process of long-run equilibrium in a perfectly competitive market.
- (b) Under what conditions, will the long-run industry supply curve be negatively sloped though every firm in the industry has a rising marginal cost curve? 6+4
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2021

ECONOMICS — HONOURS

Paper : CC-5

(Intermediate Microeconomics – I)

Full Marks : 65

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as far as practicable.*

Group – A

1. Answer **any ten** questions : 2×10
- (a) Explain whether the following statement is true or false— “the law of diminishing marginal utility does not apply to a production function that exhibits constant returns to scale.”
 - (b) Does the backward bending labour supply curve imply that leisure is a luxury?
 - (c) The marginal product of labour for production of a good X is 50 units per hour. The marginal rate of technical substitution of hours of labour for hours of machine is $\frac{1}{4}$. What is the marginal product of capital?
 - (d) How is quasi rent related to total fixed cost of production?
 - (e) Define moral hazard and give an example.
 - (f) Let $q = L^2 + 2L + 4$ be the production function of a perfectly competitive firm. For $W = ₹ 48$ and $P = ₹ 6$, find the profit maximizing employment level of the firm, where L is the level of labour employment, W is the wage rate and P is the price level.
 - (g) What is the degree of homogeneity of a Cobb-Dauglas production function $q = AL^\alpha K^\beta$? Under what condition does the production function exhibits CRS?
 - (h) Why is the demand for input is called as derived demand?
 - (i) Anindya lives in a world of two time periods-today and tomorrow. At the beginning of each period he earns ₹ 210. If the interest rate in each period is 0.5, what is the present value of his life time income?
 - (j) If the production function is given by $Q = K + L$ and the prices of capital and labour are ₹ 2 and Re 1 respectively, how will the expansion path look like?
 - (k) The equation of the total cost curve facing a perfectly competitive firm in the short run is $TC = 50 + 2Q^2$. At what level of output average cost of production will be minimum?
 - (l) Sahana is observed to purchase $Q_1 = 20$, $Q_2 = 10$ at prices $P_1 = 3$ and $P_2 = 6$. She is also observed to purchase $Q_1 = 18$, $Q_2 = 4$ at prices $P_1 = 3$ and $P_2 = 5$. Is her behaviour consistent with the axioms of the theory of revealed preference?

Please Turn Over

- (m) The owner of a small retail store does her own accounting work. How would you measure the opportunity cost of her work?
- (n) If the utility function of an individual is given by $u = 2w$, where w denotes wealth. Comment on his attitude towards risk.
- (o) For a firm $MP_L = 10$, $MP_K = 15$, $P_L = ₹ 30$ and $P_K = ₹ 15$. Explain why the firm is being run inefficiently.

Group – B

2. Answer *any three* questions :

- (a) The utility function of an individual is given by $u = w^2$, where u = utility and w is the level of wealth. Comment on his attitude towards risk. Draw his utility function. 3+2
- (b) Do you think that the decreasing cost is compatible with the features of a competitive market? 5
- (c) A firm produces bicycles using two variable inputs— bicycle frames and wheels.
 - (i) What would be the shape of the isoquants?
 - (ii) What is the degree of substitutability between the two inputs?
 - (iii) Draw the isoquants for 100 and 200 units of output. 1+1+3
- (d) (i) Explain the relationship between Long Run Average Cost (LRAC) and returns to scale.
 - (ii) What happens to the LRAC if there is an improvement in the technology? 3+2
- (e) Define value of Marginal Product of Labour. In a perfectly competitive set up, how is it related to Marginal Revenue Product of Labour? 2+3

Group – C

Answer *any three* questions.

- 3. (a) Suppose that a competitive firm has a total cost function $C(q) = 450 + 15q + 2q^2$. If the market price is $P = ₹ 115$ per unit, find the level of profit and the level of producer's surplus. 3+2
- (b) Each firm in a competitive market has a cost function $C = 16 + q^2$. The market demand function is given by $Q = 248 - p$. Determine –
 - (i) The long run equilibrium price and quantity per firm.
 - (ii) Also find the market output and the number of firms. 3+2
- 4. (a) Is it possible for the long run supply curve of a competitive industry to be positively sloped? Explain. 3
- (b) A competitive firm has the following short run cost function : $C(q) = q^3 - 8q^2 + 30q + 5$.
 - (i) Find the expressions for Marginal cost, Average cost, Average variable cost.
 - (ii) At what range of prices will the firm supply zero output?
 - (iii) At what price would the firm supply exactly 6 units of output? 2+3+2

5. (a) A bottling company uses two inputs to produce bottles of soft drinks : machines (K) and workers (L). The machine costs ₹ 1,000 per day to run and the workers earn ₹ 200 per day. At current level of production, the marginal product of the machine is an additional 200 bottles per day and marginal product of labour is 50 more bottles per day. Is the firm minimizing cost? Explain why. If it is not minimizing cost, explain how the firm should change the ratio of inputs it uses to lower its cost.

1+2+2

- (b) By studying, Shyam can produce a higher grade on an upcoming economics exam. His production function depends on the number of hours he studies marginal analysis problems A, and the number of hours he studies supply and demand problems, R, and is given by : $G_S = 2.5A^{0.36} R^{0.64}$.

(i) What is Shyam's MRTs between studying the two types of problems if he distributes his study time equally between marginal analysis and demand supply problems.

(ii) Interpret the result.

3+2

6. (a) The utility obtained by an individual from a certain wealth of ₹ 10,000 is the same as his expected utility from investing this wealth in the capital market. If there is 75% probability of getting a return of ₹ 15,000 and 25% probability of getting a return of ₹ 6,000 from the investment project, what is his risk premium? Comment on the attitude towards risk of this person.

4+1

- (b) A person's utility from wealth is given by $u(w) = 2\sqrt{w}$. The person's initial asset holding is ₹ 25. The person can accept a gamble where she wins ₹ 11 with probability $\frac{1}{2}$ and lose ₹ 9 with probability $\frac{1}{2}$.

(i) What is his expected utility from the gamble?

(ii) Will he accept the gamble?

(iii) Comment on his attitude towards risk.

3+1+1

7. (a) A person faces two income streams A and B which generates income according to the following schedule :

| Stream | Income (₹) | |
|--------|----------------|---------------|
| | Current Period | Future Period |
| A | 100 | 150 |
| B | 120 | 130 |

Which stream will be adopted if the one period interest rate is 10%?

5

- (b) Suppose a consumer survives of just two time periods 1 and 2. The consumer gets income M_1 and M_2 in the two periods and consumes C_1 and C_2 . The consumer can reallocate consumption between the two periods by saving or borrowing. If the ruling rate of interest is r , what is the present value of his lifetime income? Draw the intertemporal budget line for the consumer.

2+3