Indian Statistical Institute, Bangalore

B.Math (H) Third Year

Mid-Semester - Economics I

Maximum marks: 40 Time: 3 hours Date: September 21, 2023

Section 1: All questions are of one mark each. All questions are compulsory.

1. The demand for an inferior good _____ with an increase in the income of the consumer.

a. Increases b. Decreases c. Remains the same.

2. If the quantity of a commodity demanded remains unchanged as its price changes, the coefficient of price elasticity of demand is

a. Greater than 1 b. Equal to 1 c. Smaller than 1 d. Zero

3. I. The average variable cost curve and marginal cost curve are both U shaped in the short run.

II. This is because initially there are increasing returns and after a particular level of output, the law of diminishing returns starts operating.

Is statement II the correct explanation for statement I?

4. The fact that Anita spends no money on travel:

a) implies that he does not derive any satisfaction from travel.
b) implies that he is at a corner solution.
c) implies that his MRS does not equal the price ratio.
d) any of the above are possible.

5. In a situation where a producer experiences increasing returns or economies of scale, it implies that the

a) long run average cost is high.
b) long run average cost is rising.
c) long run average cost is constant.
d) long run average cost is falling.

6. The demand curve for good A is given by $Q_D = 100 - P_A - P_B$, wherein P_B represents the per unit price of good B, What is the relationship between good A and B?

a. Substitutes b. Complements c. Unrelated Goods

7. Minimum Wage is a price_____ (ceiling/floor) and it is set _____ (above/below) the market equilibrium price.

8. In monopolistic competition, the firms sell _____ (identical/differentiated) products but since there is free entry and exit of firms, in the long run economic profits will be_____(positive/negative/zero).

9. India and Sri Lanka make ships and cars using the following inputs. Which country has comparative advantage in producing cars? Why?

Country	Number of hours to make a ship	Number of hours to make a car
Japan	100	200
Korea	250	300

10. In a country, if production is on any point inside the Production Possibility Frontier, then

a. The economy is inefficient

b. The economy can produce more of one or both goods

c. The economy has unused resources

d. All of the above.

Section 2: All questions are of two marks each. Answer any five questions.

1. Is a pure monopoly better for a consumer than a monopolist who practices perfect price discrimination? Explain (with graphs).

2. Categorise these into private goods, public goods, artificially scarce or club goods and common property resources:

Defence forces, Books, Forests (from which forest products are used by locals), Wi-Fi (free access), Groundwater, Public Toilets, Membership at Cult Fit.

3. You just got out of work and are booking an Uber to return home during peak hours. The government has set a price ceiling because of which the fares are normal (no surge) but there are no available cabs. Why does this happen? Is the price ceiling by the government an effective policy? Explain.

4. The market demand and supply for ice-cream are given by $Q_D = 150 - P$ and $Q_S = 3P$ respectively. Use these in order to answer the following questions

a) Find the equilibrium price and quantity for ice-cream using a well labelled diagram. (1 mark).

b) For some reason, the demand for ice-cream reduces. What will happen to the market demand curve for ice-cream, use a diagram to describe the change in the market demand curve for ice-cream? (1 mark).

5. What are the profit maximizing conditions for a perfect competitive producer? When does a firm decide to shut down the business?

6. Both my socks are perfect_____ (substitute/ complementary) goods, so my indifference curves will be _____(L-shaped/ straight lines) and the price effect of any price change will be entirely equal to my _____ (income/ substitution) effect, as the _____(income/substitution) effect will be zero.

7. Use the following information in order to calculate the total fixed and variable costs and marginal cost for each level of output.

Output	Total Cost
0	500
1	515
2	530
3	545
4	560
5	575
6	590
7	605
8	620

Section 3: All questions are of five marks each. Answer any four questions.

1. Suppose a consumer has a utility function U(X,Y) = XY, X and Y being the two goods he wishes to consume. The price of X is Rs. 20 and price of Y is Rs. 30 and the money he wishes to spend on X and Y is Rs. 1200.

a) State the consumer problem and solve for the optimal bundle (or consumer equilibrium). (with diagram)

b) What happens to the optimal bundle if the price of Y increases to Rs. 40? (give diagram)

2. From the table given below find the following:

a) If the scooter producer makes and sells 4 scooters, what will be its total revenue? (1 mark).

b) If the scooter producer decides to make and sell 2 scooters rather than 1 scooter, how much additional revenue will the firm gain? (1 mark)

c) What is the marginal cost of producing the fourth scooter? (1 mark)

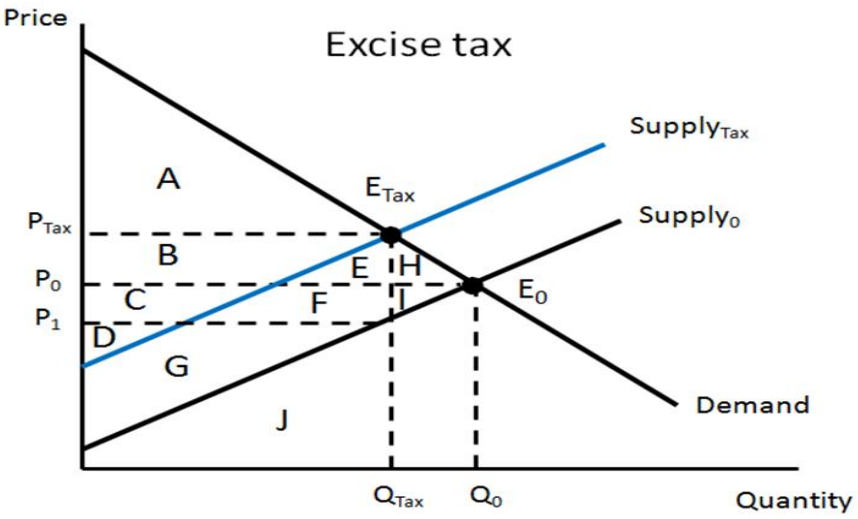
d) What is the profit-maximizing output level of the firm and why? (2 marks)

Quantity of Scooters	Selling Price ($)	Total Revenue ($)	Marginal Revenue ($)	Total Cost ($)	Marginal Cost ($)	Profit ($)
0				1000	--	
1	1700			1600		
2	1400			2000		
3	1100			2500		
4	800			3100		

3. Suppose government puts a tax on the supply of a particular medicine. In the following graph, the demand and supply of the medicine is shown pre-tax and post-tax.

a) What is the producer surplus, consumer surplus and deadweight loss after tax. (name the area) (2.5 marks)

b) If there are no close substitutes of this medicine in the market, what will happen to the demand curve? Will that change the amount of producer surplus, consumer surplus and deadweight loss? (Show in graph) (2.5 marks)



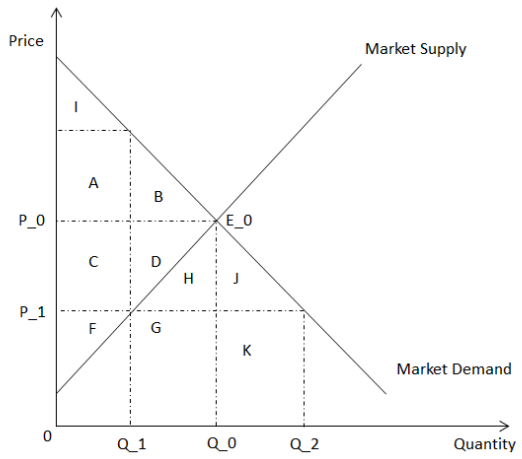
4. There are two firms in the market, selling differentiated but highly substitutable goods and there are barriers to entry of more firms.

Both face the same demand curve P= 200 - 4Q, where Q= Q_1+Q_2; the cost structure of both firms being C_1= 10Q_1 and C_2= 4Q_2

a) What will be their equilibrium quantity, price and profit? (3 marks)

b) What will happen to the profit of both firms if one gets the advantage of entering the market first? (2 marks)

5. Use the following graph to the answer the following



a) Calculate the consumer and producer surplus at the initial equilibrium point E_0. (2 marks)

b) Suppose that the Government decides to impose a price ceiling equal to P_1, what will happen to the market equilibrium following the imposition of the price ceiling. (1 mark)

c) Calculate the consumer and produce surplus following the price control. (2 marks)