

Indian Statistical Institute, Bangalore

B. Math (Hons.) Third Year

First Semester - Economics I

Midterm Exam
Maximum marks: 40

Date: September 13, 2019
Time: 3 Hours

All questions are to be completed

ONE MARK QUESTIONS (8 MARKS)

1. In equilibrium, the magnitude of the slope of an indifference curve is:
 - a. called the marginal rate of tax.
 - b. equal to the ratio of the total utility of the goods.
 - c. equal to the ratio of the prices of the goods.
 - d. all of the above.

2. 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?
 - a. Yes
 - b. No

3. The fact that Alice spends no money on travel:
 - a. implies that she does not derive any satisfaction from travel.
 - b. implies that she is at a corner solution.
 - c. implies that her marginal rate of substitution is not equal to the price ratio.
 - d. any of the above are possible.

4. 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

5. Use the following two statements to answer this question:
 - I. The average product curve and the marginal product curve reach their maxima at the same level of output.

II. The average product falls and the marginal product becomes negative in the zone of diminishing returns.

- a. Both I and II are true.
- b. I is true, and II is false.
- c. I is false, and II is true.
- d. Both I and II are false

6. If potatoes are a Giffen good, then...

- a. potatoes are also a normal good.
- b. potatoes are also a luxury good.
- c. an increase in the price of potatoes will increase the quantity demanded.
- d. there will always be a surplus of potatoes.
- e. potatoes must make up a small portion of consumers' total expenditure.

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

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

2 MARKS QUESTIONS (16 MARKS)

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

2. China and Australia have iron ore and manufacture cars with given resources.

Country	Iron Ore	Cars
China	80	100
Australia	70	50

- a) Which country has comparative advantage in producing cars? (1)
- b) If Australia gets some new technology using which it can produce 100 cars rather than 50, which country has a comparative advantage in producing cars? (1)

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

Army, Books, Forests (from which forest products are used by locals), Wi-Fi (free access), Groundwater, Public Toilets, Membership at Alliance Franchise, Cup of coffee you buy in the canteen.

4. 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.
5. The market demand and supply for ice-cream are given by $Q_D = 200 - P$ and $Q_S = 4P$ 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)
 - b) With the change in temperature, 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)
6. What are the profit maximizing conditions for perfect competitive producer? When does a firm decide to shut down the business? (1+1)
7. Sahil is an engineer from IIT and is appearing for a job interview. He shows his curriculum vitae (CV) to the board.
 - a) It is mentioned in his CV that he is trained in Python and R and has been the student representative for 2 years. What is this an example of? (1)
 - b) Is the supply of engineers going to be wage elastic or wage inelastic? Why? (0.5+0.5)
8. Both my gloves 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.

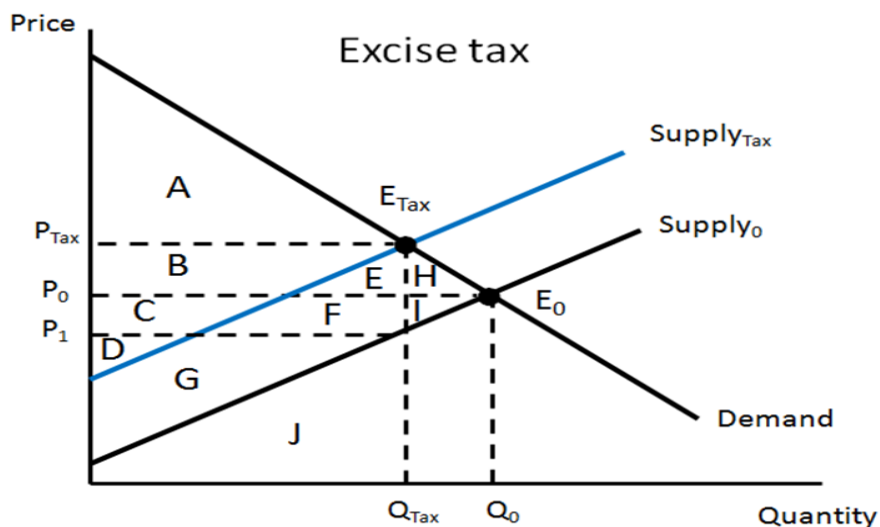
4 MARKS QUESTIONS (16 MARKS)

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. 10 and price of Y is Rs. 15 and the money he wishes to spend on X and Y is Rs.600.
 - a) State the consumer problem and solve for the optimal bundle (or consumer equilibrium). (with diagram) (1+1)
 - b) What happens to the optimal bundle if the price of Y increases to Rs. 20? (give diagram) (2)

2. From the table given below find the following:
- If the scooter producer makes and sells 4 scooters, what will be its total revenue? (1)
 - If the scooter producer decides to make and sell 2 scooters rather than 1 scooter, how much additional revenue will the firm gain? (1)
 - What is the marginal cost of producing the fourth scooter? (1)
 - What is the profit-maximizing output level of the firm and why? (1)

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.
- What is the producer surplus, consumer surplus and deadweight loss after tax. (name the area) (1.5)
 - 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)



- 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 $P = 100 - 2Q$, where $Q = Q_1 + Q_2$; the cost structure of both firms being $C_1 = 5Q_1$ and $C_2 = 2Q_2^2$

- a) What will be their equilibrium quantity, price and profit? (2)
- b) What will happen to the profit of both firms if one gets the advantage of entering the market first? (2)