Question 1 (MSQ)

Under third-degree price discrimination, a monopolist would allocate output to ensure that in each market:

a) the marginal revenue is the same
b) marginal cost is the same
c) the slope of the demand curve is the same.
d) the producer surplus is maximized
e) the elasticity of demand is the same

Question 2 (MSQ)

A firm will find it difficult to engage in price discrimination if:

a) consumers can purchase in one market and sell in other markets and make arbitrage gains.
b) there are close substitutes for the product in the market.
c) many consumers are trying to purchase similar kinds of goods.
d) the good is inferior.
e) the demand curve is downward-sloping.

Question 3 (MCQ)

Suppose a monopolist caters to a market that has constant elasticity of demand and its elasticity is equal to 3. If the marginal cost of production is equal to 5 then a profit-maximizing monopolist will set a price equal to

a) 7.5
b) 3.75
c) 6.67
d) 6
e) 2.8

This question is changed to NAT

Question 4

A monopoly market structure is bad since

a) monopolist pricing decision creates dead weight loss that reduces overall welfare
b) the monopolist has the market power to set a price that maximizes its profit irrespective of consumer surplus
c) the monopolist expropriates a part of the consumer surplus
d) at all market condition monopolist always make a profit through their pricing decision
e) a monopolist can discriminate prices across the market by differentiating the product

Question 5

A monopoly market is in equilibrium when the elasticity of the market demand curve is one then the marginal cost of production for the monopolist is

a) 0
b) is at its minimum

c) is at its maximum
d) cannot be determined

Question 6 (NAT)

A monopoly market has a demand curve of $P = 36 - 2Q$ and the producer has a marginal cost of $2Q$. If a government imposes a price ceiling such that there is no deadweight loss in the market then the difference between the monopoly price and the price ceiling is _____

Answer Range: [6-6]

Solution

Monopoly Solution:

$MR = 36 - 4Q$

Equilibrium $MR = MC$ implying $36 - 4Q = 2Q$ so, $Q_M^* = 6$ $P_M^* = 24$

Price ceiling such that DWL=0 is where $P = MC$, so $36 - 2Q = 2Q$, $Q_C^* = 9$ and $P_C^* = 18$

So, $P_M^* - P_C^* = 24 - 18 = 6$

Question 7 (MSQ)

For a market to be a natural monopoly it is required that

a) marginal cost should be falling for all the levels of output
b) marginal cost should be below the average cost
c) the government should create a barrier to entry into the market
d) marginal cost should intersect the marginal cost curve from below
e) average variable cost should be more than the average total cost

Question 8 (MSQ)

The profit-maximizing condition for a single product per monopoly without any price discrimination is

a) $p\left[1 - \frac{1}{\epsilon}\right] = MC$
b) $\frac{p-mc}{p} = \frac{1}{\epsilon}$
c) $p\left[1 + \frac{1}{\epsilon}\right] = MC$
d) $\frac{p-mc}{p} = -\frac{1}{\epsilon}$
e) $\frac{p-mc}{mc} = \frac{1}{\epsilon}$

Question 9 (MCQ)

If a perfectly competitive market is operating in a decreasing cost condition then the slope of the short run supply curve will be _____ and the slope of the long run supply curve will be _____

a) positive; negative
b) positive; positive
c) positive; indeterminate

d) positive; zero
e) negative; negative

Question 10 (MCQ)

An important condition that is required to hold for a perfectly competitive market structure to exist is

a) all market participants have perfect information on all relevant prices and technology in the market.
b) the producers in the market make zero economic profit
c) the market must contain firms and buyers who trade significant quantities of produced output.
d) the market participants adjust their buying and selling behavior based on the buying and selling behaviour of other participants.
e) the transacted goods have to be normal goods

Question 11 (MCQ)

Suppose the market for fish in Mumbai is operating under perfect competition characterized by the market demand of $Q^d = 1000 - 20P$. If each fish seller faces a total cost function given by $TC = 5q^3 - 6q^2 + 3q$.The firm's supply function is

a) $15q^2 - 12q + 3$ if $q \geq 0.6$
b) $15q^2 - 12q + 3$ if $q \geq 0.4$
c) $15q^2 - 12q + 3$if $Q \geq 0.6$
d) $15q^2 - 12q + 3$if $q \geq 0.3$
e) $15q^2 - 12q + 3$ if $q \geq 0.5$

Question 12 (MSQ)

Which is true concerning the shutdown point and the break-even point for a perfectly competitive firm?

a) the shutdown point is the minimum average variable cost and the break-even point is the minimum average total cost
b) the firm's supply function is that part of the marginal cost curve that starts from the shutdown point but passes through the break-even point if the firm participates in the market
c) the shutdown point is the minimum average total cost and the break-even point is the minimum average variable cost
d) the firm's supply function is that part of the marginal cost curve that starts from the break-even point but passes through the shutdown point
e) the shutdown point is the minimum average variable cost and the break-even point is the minimum average fixed cost

Question 13(MSQ)

In a perfectly competitive market structure firms will enter if

a) firms make an economic profit
b) firms equilibrium is such that $P = MC$ and $P > \min(ATC)$
c) there is excess supply in the market and market price falls
d) firms equilibrium is such that $P = MC$ and $P > \min(AVC)$
e) there is excess supply in the market and market price increases

Question 14

Which of the following statement is true about a firm in a perfectly competitive market structure when the market price has fallen below the minimum of the average variable cost

a) the firm will immediately stop production to minimize its losses
b) the firm will continue to produce to meet its fixed costs\
c) the firm will stop production if it can pay the labour cost
d) the firm will continue to produce in the short run but will likely exit the market in the long-run ed cost
e) firms would invest to innovate new product

Question 15

Suppose the market for fish in Mumbai is operating under perfect competition characterized by the market demand of $Q^d = 1000 - 20P$. If each fish seller faces a total cost function given by $TC = 5q^3 - 6q^2 + 3q$. Then the total number of firms in the market when each firm makes zero economic profit is _____.

Answer: [1600, 1650]

Solution:

$ATC = 5q^2 - 6q + 3$

$\min ATC = 10q - 6 = 0$

So, $q^* = 0.6$

$P = \min ATC = 5\,(0.6)^2 - 6(0.6) + 3 = 5(0.36) - 3.6 + 3 = 1.8 - 0.6 = 1.2$

Market equilibrium quanity

$Q^* = 1000 - 20(1.2) = 1000 - 24 = 976$

$n = \frac{976}{0.6} \approx 1627$

Question 16

Consider the perfectly competitive market for oranges, with market demand P = 10 − Q and

market supply P = Q. Consumers currently buy 2 units at a price of 8 per unit. Which of the following

could be true?

I. A per unit tax of 6 is imposed on sellers

II. A price floor of 8 is imposed on the market

III. Due to a cyclone the supply equation has become P = Q + 4

a) I and II
b) Only I
c) Only II
d) Only III

e) I and III

Question 17

Consider a market with upward-sloping supply and downward-sloping demand such that the suppliers are more price responsive than the consumer. In this market, the government imposed a tax of Rs. 100 on the supplier then the following possible situation can arise

a) The tax burden falls more on the consumer
b) Prices received by the seller will drop by Rs. 100
c) Prices received by the consumer will increase by Rs. 100
d) The tax is equally split by the consumer and the producer
e) The tax burden falls more on the supplier

Question 18

Consider a market for a digital camera that faces immense competition from the mobile phone as its camera is a viable substitute for a digital camera. To meet the growing competition the producers of the digital camera have successfully invented a new production technology which had improved the efficiency of its production. So we can conclude that in the market for digital camera that the equilibrium price will _____ and the equilibrium quantity will _____ .

a) decrease; either increase or decrease
b) either increase or decrease; decrease
c) increase; either increase or decrease
d) either increase or decrease; increase
e) either increase or decrease; either increase or decrease

Question 19

When the supply for good increases (the supply curve **shifts** to the right) and the demand for the good remains unchanged, the change in the producer surplus is

a) ambiguous
b) decreases
c) increases
d) unchanged
e) more than the change in the consumer surplus

Question 20

When, in a particular market where the law of demand and the law of supply both apply, the imposition of a binding price floor in that market causes the quantity demanded to be

a) less than the quantity supplied.
b) greater than the quantity supplied.
c) equal to quantity supplied.
d) can be either greater than or less than quantity supplied

Subjective Question

In all the questions please show your working properly as there will be step marking.

Answer any 4 questions

Question 1

In a market, the demand function is given by

Demand Curve: $P_D = 1200 - 2Q$

the supply function is given by

Supply function: $P_S = 200 + 3Q$

a) Determine the equilibrium price and quantity in the market [1 Mark]
b) Determine the consumer surplus and the producer surplus in the market [1 Mark]
c) If a government imposes a price ceiling of 500, then determine the excess demand in the market [1 Mark]
d) If the price ceiling is 500 then what will be the dead weight loss in the market [1 Mark]
e) Rather than imposing a price ceiling if the government imposes a lumpsum (constant) tax of amount $T = 500$ then what will be the tax revenue for the government [1 Mark]

Solution:

If the diagram is correct but calculation is not correct then give marks

a) $1200 - 2Q = 200 + 3Q \;\; Q^* = 200$ and $P^* = 800$
b) $CS = \frac{1}{2} \times 200 \times 400 = 40000$
   $PS = \frac{1}{2} \times 200 \times 600 = 60000$
c) $ED = \left(\frac{1200-500}{2}\right) - \left(\frac{500-200}{3}\right) = 350 - 100 = 250$
d) $DWL = \frac{1}{2} \times (1000 - 500) \times (200 - 100) = 25000$
e) $Tax\ Revenue = 100 \times 500 = 50000$

Question 2

In a monopoly market, the monopolist caters to the market having a demand function

Demand function: $P = 1000 - 5Q$

and the cost function of the monopolist is

Cost function: $C(Q) = 5Q^2 + 20$

a) Determine the equilibrium price, quantity, and profit in the monopoly market [1 Mark]
b) What is the deadweight loss in the monopoly market [1 Mark]
c) If a government imposes a price ceiling of 700, then what will be the increase in consumer surplus [1 Mark]

d) By how much amount the deadweight loss of the monopoly market decline as the government imposes the price ceiling of Rs. 700. [1 Mark]

e) Does government intervention have a welfare-enhancing role in the monopoly market structure? Explain your answer with a convincing argument. [1 Mark]

Solution:

Answer

a)

$MR = 1000 - 10Q$

$MC = 10Q$

$Q_E: 1000 - 10Q = 10Q$

So, $Q_E = 50$ and $P_E = 1000 - (5 \times 50) = 750$

Profit: $(50 \times 750) - (5 \times 50^2 + 20) = 37{,}500 - 12{,}520 = 24980$

b)

DWL_M

Competetive solution is when $P = MC$ i.e. $1000 - 5Q = 10Q$ So, $Q_c = \frac{1000}{15} = 66.7$

At Q_E: the $MC = 10 \times 50 = 500$

So, the DWL: $\text{DWL}_\text{M} = \frac{1}{2} \times (750 - 500) \times (66.7 - 50) = 2{,}087.5$

c) CS under monopoly

$CS_M = \frac{1}{2} \times 50 \times 250 = 6250$

CS under the ceiling price of 700

Q under the $P = 700$: $Q = \frac{1000-700}{5} = 60$

$CS_C = \frac{1}{2} \times 60 \times (1000 - 700) = 9000$

$CS_C - CS_M = 9000 - 6250 = 2750$

d)

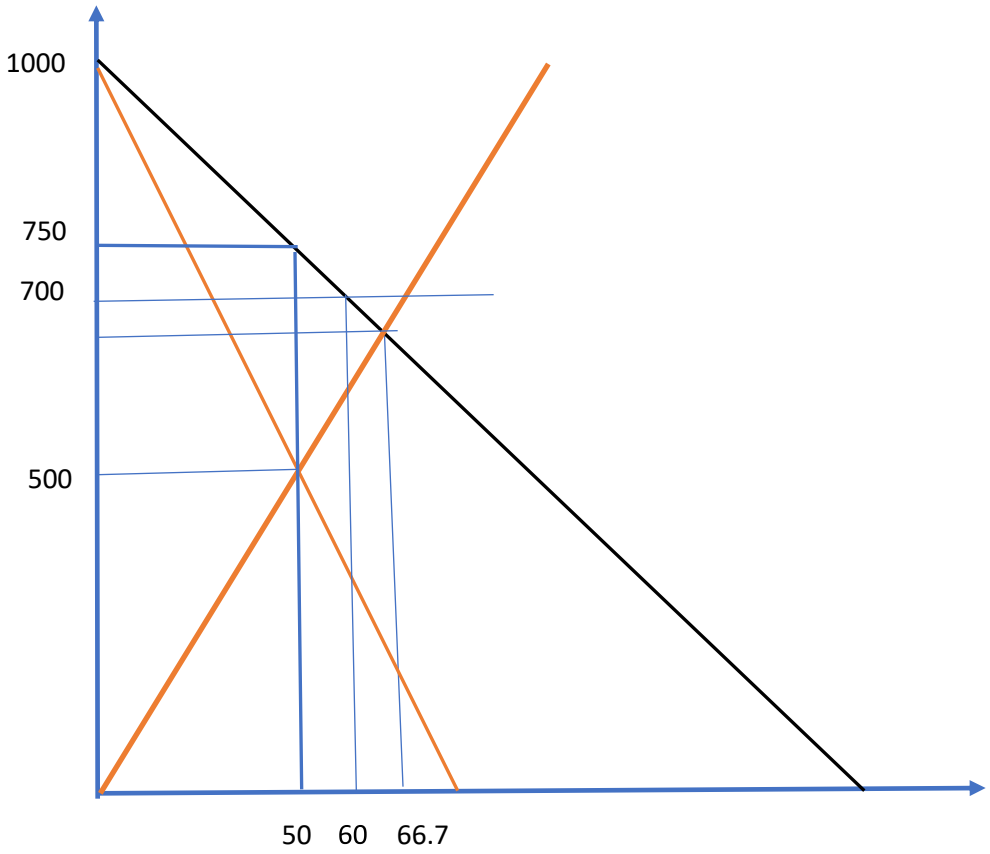
Decline in the DWL

MC when the Q=60 is $MC = 10 \times 60 = 600$

$DWL_C = \frac{1}{2} \times (700 - 600) \times (66.7 - 60) = 335$

So, $DWL_M - DWL_C = 2{,}087.5 - 335 = 1752.5$

f) Yes, it has an welfare enhancing role as the DWL due to the monopoly market structure reduces as the ceiling is impose. However, is the price is below 500 this welfare enhancing role will diappear.



Question 3

Consider a third-degree price discriminating monopolist who is catering its output to two separate markets (such that there is no arbitrage option for the customers). The demand function for these markets is given as

Market 1: $P_1(Q_1) = 44 - Q_1$

Market 2: $P_2(Q_2) = 22 - 2Q_2$

The monopolist technology is such that the marginal cost of production is 2 with zero fixed cost (so the total cost curve is $2Q$). If the monopolist can effectively discriminate prices across the two markets then determine

a) profit-maximizing prices and quantity in Market 1 and Market 2 and the maximum profit earned in the price discrimination strategy [1 Mark]

Suppose the government intervenes in this market and makes any sort of price discrimination across the market illegal such that the monopolist had to cater to both markets simultaneously. So, the monopolist

adds the market demand and sets the price and quantity such that it is operating in a pure monopoly market. Determine in this case

b) the combined market demand function from both markets. (it is determined from the horizontal summation of the individual market demand curve) [1.0 Mark]
c) the profit-maximizing price and quantities in Market 1 and Market 2 [2.0 Marks]
d) total profit to the monopolist from the non-discriminating pricing policy [1.0 Mark]

Solution

a) Price discriminating monopolist

$$\pi(Q_1, Q_2) = (44 - Q_1)Q_1 + (22 - 2Q_2)Q_2 - 2(Q_1 + Q_2)$$

The profit maximization condition for the monopolist is

$\frac{\partial \pi}{\partial Q_1} = 44 - 2Q_1 - 2 = 0$

So, $Q_1^* = 21$ and $P_1^* = 23$

$\frac{\partial \pi}{\partial Q_2} = 22 - 4Q_2 - 2 = 0$

So, $Q_2^* = 5$ and $P_2^* = 12$

b) Profit $\pi_{max} = (21 \times 23) + (12 \times 5) - (2 \times 26) = 491$

c) Note if $P > 22$ only the consumers in Market 1 demand the commodity
Therefore if $P > 22$ market demand curve is $44 - Q$
If $P \leq 22$ then the consumers from both the markets will demand the good.
At $P = 22$ the market demand is $Q = 22$
Consider any other price say $P = 10$ then the total demand in the market is $Q = \frac{22-10}{2} + (44 - 10)$
So, $Q = 40$
Two points on the market demand curve are
$(Q_1, P_1) = (22, 22)$ and $(Q_2, P_2) = (40,10)$

So the market demand function is $P \leq 22$ then $P = \frac{110}{3} - \frac{2}{3}Q$

Therefore the market demand function is

$$P = \begin{cases} 44 - Q & if\ P > 22 \\ \frac{110}{3} - \frac{2}{3}Q & if\ P \leq 22 \end{cases}$$

Note that if market demand $Q < 22$ then $P > 22$ only the customer of market 1 is served.
On the other hand if
$Q > 22$ then $P < 22$ then the customer of both markets are served.

d) The marginal revenue curve is

$$MR = \begin{cases} 44 - 2Q \ \ if\ MR > 22 \\ \frac{110}{3} - \frac{4}{3}Q \ \ if\ MR \leq 22 \end{cases}$$

If the marginal cost=2

Then the monopolist will maximize its revenue when $MR = MC$ i.e.

$\frac{110}{3} - \frac{4}{3}Q = 2$

So, $Q_M^* = 26$, and $P^* = \frac{58}{3}$ both the markets will have the same price i.e. $\frac{58}{3}$

The total quantity sold to the consumers in Market 1 is

$\frac{58}{3} = 44 - Q_1$ so, $Q_1^* = \frac{74}{3}$

The total quantity sold to the consumers in Market 1 is

$\frac{58}{3} = 22 - 2Q_2$ so, $Q_2^* = \frac{4}{3}$

Note that $Q_1^* + Q_2^* = \frac{74}{3} + \frac{4}{3} = 26$

e) Total profit is

$\pi = \left(\frac{58}{3} \times \frac{74}{3}\right) + \left(\frac{58}{3} \times \frac{4}{3}\right) - (2 \times 26) = 450.667$

Note in this answer that in this case when the monopolist is catering to the market 1, at the non-discriminating price and quantity is $(Q_1^*, P^*) = (\frac{74}{3}, \frac{58}{3})$ the elasticity of the demand curve is

$$\epsilon_1 = -(-1) \times \frac{58}{74} = 0.78$$

If the monopolist caters to the market 2, at the non-discriminating price and quantity is $(Q_2^*, P^*) = (\frac{4}{3}, \frac{58}{3})$ the elasticity of the demand curve is

$$\epsilon_1 = -(-\frac{1}{2}) \times \frac{58}{4} = 7.2$$

So, the monopolist under this non-discriminating pricing policy is catering to a non-elastic market. However, it won't exit the inelastic market as by exiting market 1, it would only cater to market 2 produce 5 units of goods, and will have a profit 0f 60 which is less than the profit if it stays in market 1, caters to the inelastic part of the demand and has a profit of 450.7.

Question 4

In a perfectly competitive market suppose the overall market demand curve is given by

Demand Curve: $P = 10 + W - Q$ where W is the average wealth of the consumers in the market, which can take both positive and negative values.

The market supply curve is given by

Supply Curve: $P = 2Q$

The technology in the market is such that the production does not need any fixed input and the total cost function for a firm is given by

$C(q) = q^3 - 2q^2 + 5q$

a) If the average income in the market, $W = 80$ then determine the total number of firms in the market. [1 Mark]
b) Find the average wealth W, such that the firms in the market do not make any economic profit but the number of firms remains unchanged as in part a. Show the adjustment in a neatly drawn diagram [2 Marks]
c) If $W = 80$ then how many new firms should enter the market such that the firms do not make any economic profit? Show the adjustment in a neatly drawn diagram [2 Marks]

Solution:

a) Market equilibrium
$90 - Q = 2Q$
$Q_E = 30$
$P_E = 60$
Firms
$MC = 3q^2 - 4q + 5$
Firms equilibrium: $P = MC$
$60 = 3q^2 - 4q + 5$
$3q^2 - 4q - 55 = 0$
$q = \frac{-(-4) \pm \sqrt{(4^2 - 4 \times 3 \times (-55))}}{2 \times 3}$
$q = 5$
$N = \frac{30}{5} = 6$

b) $AC = q^2 - 2q + 5$
Zero economic profit happens at the minimum of the AC curve
Minimum of the average cost is
Differentiating: $2q - 2 = 0$ So, $q = 1$
$At\ min\ AC = MC$
So $P = MC = 3 - 4 + 5 = 4$
At $P = 4$ the total quantity in the market is $Q = \frac{P}{2} = 2$
So, from the demand curve we know at equilibrium
$4 = 10 + W - 2$
$W = -4$

c) For $W = 80$
The demand curve is $P = 90 - Q$
At $AC = MC = 4$ there would be no economic profit.
At $P = 4$, $Q = 90 - 4 = 86$
At zero profit condition the firms will be producing $q = 1$
So, $N = 86$
Number of new firms that will enter will be $86 - 6 = 80$

Question 5

Write short notes and explain with an economic argument whether these sentences have any merit in them. [Marks: $2 \times 2.5 = 5$]

1. Natural Monopoly exists due to the barrier of entry into the market

No, Natural mononpoly exist where AC curve is falling and competitive firms would make a loss so they do not enter. Barrier to entry is the outcome of the market structure but not the cause. So, natural monopoly doesnot not exists due to the barrier of entry

2. The government has no role to play in a market system

In a competitive market government have no role in controlling price either by price ceiling or price floor. It creates dead weight loss

However, government can be either a producer or a consumer in the competitive market

When competition fails like in monopoly price ceiling can be welfare enhancing as the dead weight loss decreases

So, governemnt's role in the market place depends on the competition in the market.

*****End*****