**CBSE Class–12 Economics**

**NCERT Solutions**

**Chapter-06 (Microeconomics) Non-Competitive Markets**

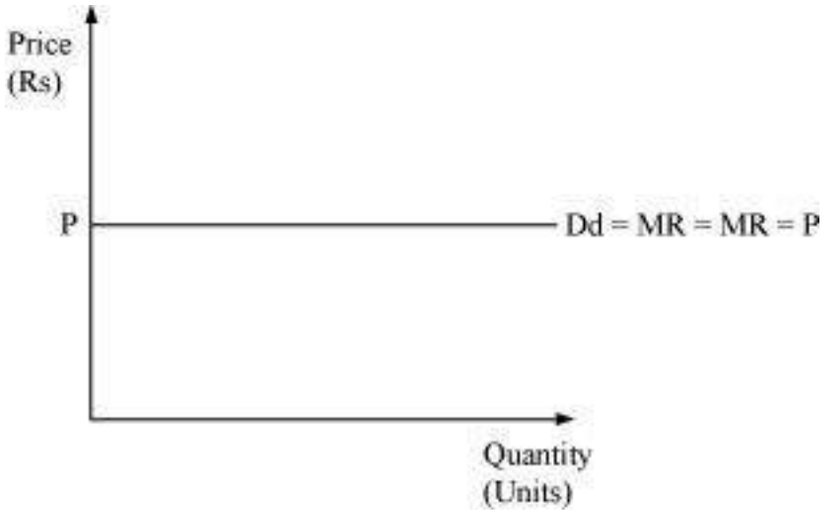
**Question 1: Whatwouldbetheshapeofthedemandcurvesothatthetotalrevenuecurveis**

**(a) apositivelyslopedstraightlinepassingthroughtheorigin?**

**(b) a horizontal line?**

**Solution :**The demand curve is a graphic representation of the relationship between product price and the quantity of the product demanded. It is drawn with price on the vertical axis of the graph and quantity demanded on the horizontal axis. It is a graphic representation of a market demand schedule.

**(a)** If the total revenue curve is a positively sloped straight line passing through the origin,thentheslopeofthedemandcurveor average revenue curve willbeahorizontallineparalleltothex-axis.This happens when prices areconstant.at all levels of output.




**(b)** If the total revenue curve is a horizontal line, then the demand curve or average revenue curve will be downward sloping. Firms can increase their volume by decreasing the price i.e., AR falls with increase in sales.

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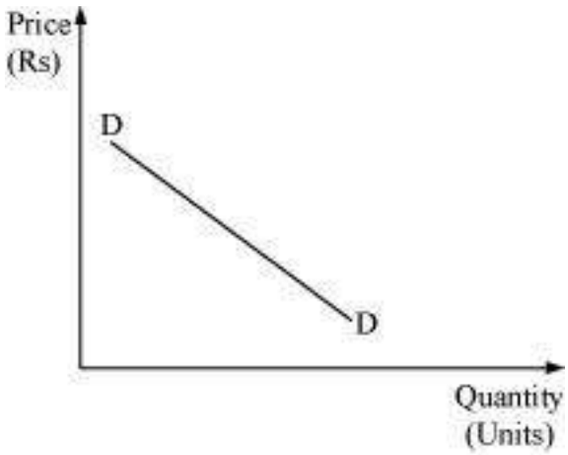


**Question 2: Fromthescheduleprovidedbelowcalculatethetotalrevenue,demandcurveandthe price elasticity ofdemand:**

| Quantity | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| Marginal Revenue | 10 | 6 | 2 | 2 | 2 | 0 | 0 | 0 | -5 |

**Solution :**

| Quantity | MR | TR | AR = TR / Q | Price elasticity of demand $Ed = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$ |
|---|---|---|---|---|
| 1 | 10 | 10 | $\frac{10}{1} = 10$ | - |
| 2 | 6 | 10 + 6 = 16 | $\frac{16}{2} = 8$ | $\frac{1}{2} \times \frac{10}{1} = 5$ |
| 3 | 2 | 16 + 2 = 18 | $\frac{18}{3} = 6$ | $\frac{1}{2} \times \frac{8}{2} = 2$ |
| 4 | 2 | 18 + 2 = 20 | $\frac{20}{4} = 5$ | $\frac{1}{1} \times \frac{6}{3} = 2$ |
| 5 | 2 | 20 + 2 = 22 | $\frac{22}{5} = 4.4$ | $\frac{1}{0.5} \times \frac{5}{4} = 2.5$ |
| 6 | 0 | 22 + 0 = 22 | $\frac{22}{6} = 3.6$ | $\frac{1}{0.9} \times \frac{4.5}{5} = 1$ |

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| | | | | |
|---|---|---|---|---|
| 7 | 0 | 22 + 0 = 22 | $\frac{22}{7}=3.1$ | $\frac{1}{0.5}\times\frac{3.6}{6}=1.2$ |
| 8 | 0 | 22 + 0 = 22 | $\frac{22}{8}=2.7$ | $\frac{1}{0.4}\times\frac{3.1}{7}=1.1$ |
| 9 | -5 | 22 + (-5) = 17 | $\frac{17}{9}=1.9$ | $\frac{1}{0.8}\times\frac{2.7}{9}=0.38$ |

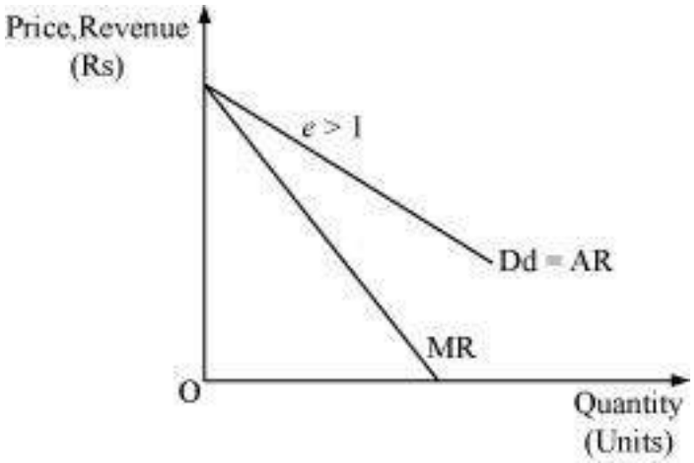
**Question 3: WhatisthevalueoftheMRwhenthedemandcurveiselastic?**

**Solution :**When demand curveiselastic$(e_d > 1)$, then according to the relationship MR=

$P\left(1-\frac{1}{e_d}\right)$,thefraction$\frac{1}{e_d}$will be less than1.

Hence,MRwillbepositivewhen$P\left(1-\frac{1}{e_d}\right)$ispositive.ARordemandcurvewillneverbe0 as TR is

alwayspositive.




The above formula is very useful when the demand function has a known constant price elasticity. Business managers must estimate the value of MR in order to arrive at decisions about price and output.

**Question 4: A monopoly firm has a total fixed cost of Rs 100 and has the following demand schedule:**

| Quantity | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|

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| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Marginal Revenue | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 |

**Find the short run equilibrium quantity, price and total profit. What would be the equilibriuminthelongrun?IncasethetotalcostisRs1000,describetheequilibrium intheshortrunandinthelongrun.**

**Solution :**

| Quantity | Price (P) (Rs) | TR= $(P \times Q)$ (Rs) |
|---|---|---|
| 1 | 100 | 100 |
| 2 | 9 | 180 |
| 3 | 80 | 240 |
| 4 | 70 | 280 |
| 5 | 60 | 300 |
| 6 | 50 | 300 |
| 7 | 40 | 280 |
| 8 | 30 | 240 |
| 9 | 20 | 180 |
| 10 | 10 | 100 |

As the total cost of the monopolist firm is zero, the profit will be the maximum where TR is the maximum. That is, at the 6th unit of output the firm will be maximising its profit and the short run equilibrium price will be Rs 50.

Profit of the firm = 300

Short run equilibrium price = Rs 50

Profit = TR – TC

= 300 – 0

Profit = Rs 300

If the total cost is Rs 1000, then the equilibrium will be at a point where the difference between TR and TC is the maximum.

TR is the maximum at the 6th level of output.

So profit = 300 – 1000 = - 700

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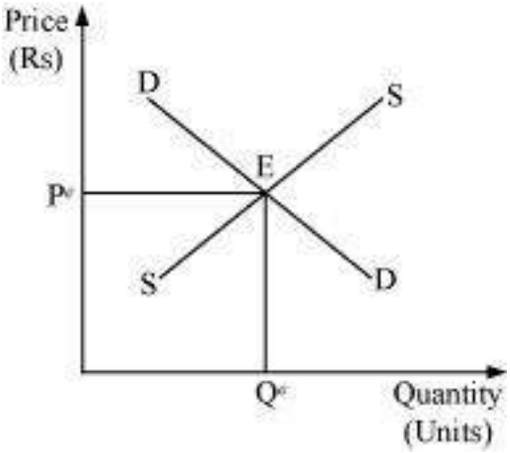
So,thefirmisearninglossesandnotprofit.Asthemonopolistfirmisincurringlossesinthe shortrun,itwillstopitsproductioninthelongrun.

**Question 5: IfthemonopolistfirmofExercise3,wasapublicsectorfirm.Thegovernmentseta rule for its manager to accept the government fixed price as given (i.e. to be a price taker and therefore behave as a firm in a perfectly competitive market). And the governmentdecidetosetthepricesothatdemandandsupplyinthemarketareequal. Whatwouldbetheequilibriumprice,quantityandprofitinthiscase?**

**Solution :**If the government sets a rule for the public sector firm to accept the fixed price, then, the monopoly firm will have to behave like a perfectly competitive firm and will be a price taker. In this case, the price fixed $P^e$, as set by the government, will equate thedemandand the supply, which will determine the equilibrium point 'E'.

At the price $P^e$, the firm earns normal profit, i.e. zero economicprofit.




Equilibrium price = $P^e$ (fixed by the government) Equilibrium

quantity = $Q^e$

Profit = Normal profit.

In a perfectly competitive market, a firm earns zero profit. It implies that a competitive firm can get only normal profit.

**Question 6: CommentontheshapeofMRcurveincasewhenTRcurveisa**

**(a) positively sloped straightline**
**(b) horizontal straightline**

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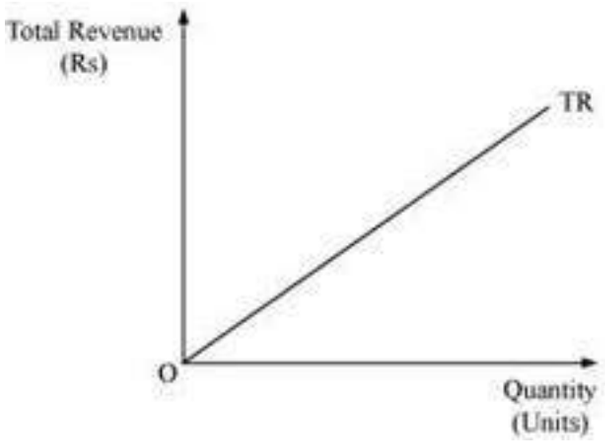
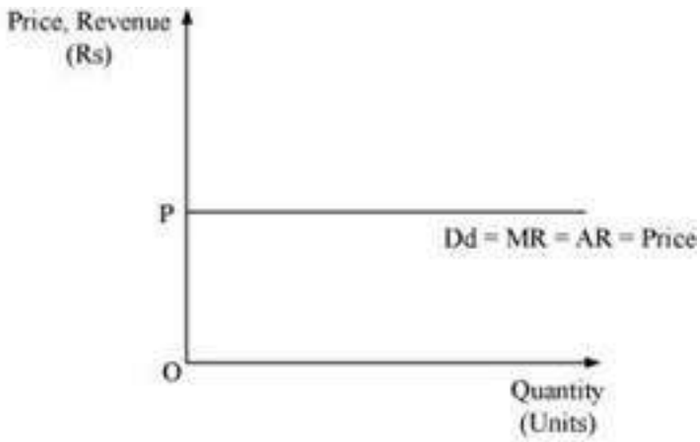
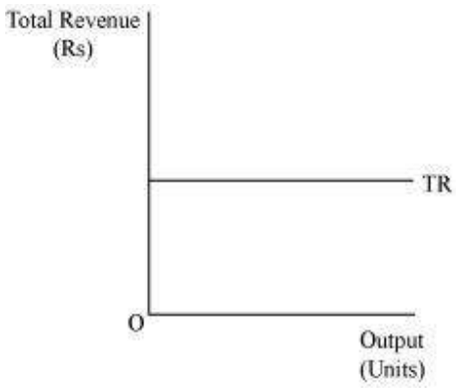
**Solution :(i)**BasedontherelationshipbetweenMRandTR,itcanbesaidthatwhenTRcurveisa positivelyslopedstraightline,thenMRcurveisahorizontalstraight line parallel to X axis.MRanddemandcurveare the same, and the price (AR) remains constant for different output levels. This happens underperfectcompetition.MRisconstanttherefore,TRincreasesatincreasingrate.Thatis whyTRispositivelyslopedstraightline.

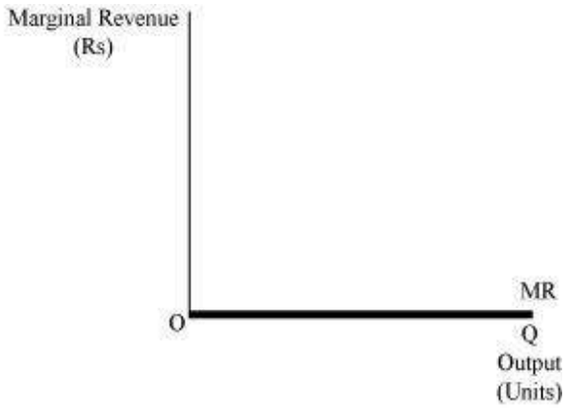



**(ii)** When TR curve is a horizontal straight line, then MR is zero as it will touch X axis. Therefore, MR curve is also a horizontal straight line and coincides with the output-axis. It is because the units sold is same at every level of output and Marginal revenue is the additional revenue generated from the sale of an additional unit ofoutput.

MR= TRn- TRn-1

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**Question 7: The market demand curve for a commodity and the total cost for a monopoly firm producingthecommodityisgiveninthescheduleesbelow.**

| Quantity | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| Price | 52 | 44 | 37 | 31 | 26 | 22 | 19 | 16 | 13 |

| Quantity | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| Price | 10 | 60 | 90 | 100 | 102 | 105 | 109 | 115 | 125 |

**Use the information given to calculate the following:**

**(a) TheMRandMCschedules**

**(b) ThequantitiesforwhichMRandMCareequal**

**(c) Theequilibriumquantityofoutputandtheequilibriumpriceofthecommodity**

**(d) Thetotalrevenue,totalcostandtotalprofitintheequilibrium Solution :(a)**

| Quantity (units) | Price / AR (Rs) | TR = $P \times Q$ (Rs) | MR = $TR_n - TR_{n-1}$ | TC (Rs) | MC= $TC_n - TC_{n-1}$ (Rs) |
|---|---|---|---|---|---|
| 0 | 52 | 0 | - | 10 | - |
| 1 | 44 | 44 | 44 | 60 | 50 |
| 2 | 37 | 74 | 30 | 90 | 40 |
| 3 | 31 | 93 | 19 | 100 | 10 |
| 4 | 26 | 104 | 11 | 102 | 2 |
| 5 | 22 | 110 | 6 | 105 | 3 |
| 6 | 19 | 114 | 4 | 109 | 4 |
| | | | | | |

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| | | | | | |
|---|---|---|---|---|---|
| 7 | 16 | 112 | -2 | 115 | 6 |
| 8 | 13 | 104 | -8 | 125 | 10 |

(b) MRequalsMCatthe6thunitofoutputi.e.,4.

(c) At equilibrium, MR equals MC, and here MR equals MC at the 6th unit of output, whereMCisupwardsloping.Thus,theequilibriumpriceisRs19.

(d) TR=Rs114

TC = Rs109

Total profit = TR – TC

= Rs 114 – 109 = Rs 5

Thus, Profit is equal to Rs 5.

**Question 8: Willthemonopolistfirmcontinuetoproduceintheshortrunifalossisincurredat thebestshortrunlevelofoutput?**

**Solution :**If the monopolist firm incurs loss in the short run, then it will stop production in the long run. Amonopolistfirmcanearnlossesintheshortruniftheprice islessthantheminimum of AC. But if the price falls below the minimum of AVC, then the monopolist will stop its operations. . The firm will continue to produce when the price is in between the minimum of AVC and the minimum ofAC.

**Question 9: Explain why the demand curve facing a firm under monopolistic competition is negativelysloped.**

**Solution :**A monopolistic firm has differentiated products; thus, it has to lower its price in order toincreaseitssales.The productsofdifferentmonopolisticfirmsareclosesubstitutestoone other.Each seller has some degree of monopoly power of ‘’Making’ the price. Since there are many close substitutes available, the result is downward / negative sloping and elastic demand curve. This means that as price decreases, the quantity demanded for that good increases.,

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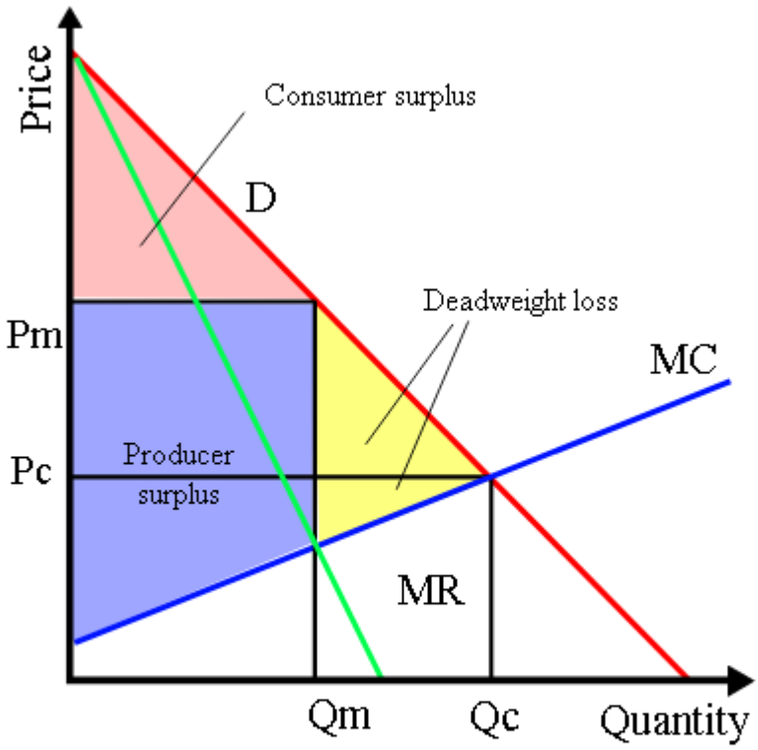


**Monopolistic Competition**: As you can see from this chart, the demand curve (marked in red) slopes downward, signifying elastic demand.

**Question 10: What is the reason for the long run equilibrium of a firm inmonopolistic competitiontobeassociatedwithzeroprofit?**

**Solution :**The long run time horizon is featured by the free entry and exit of firms. If the firms in the short run are earning abnormal or super normal profits, then, new firms will be attracted to enter the market. Due to the new entrants, the market supply will increase. It leads to the reduction in the price that ultimately falls sufficiently to become equal to the minimum of average cost. When the market price is equal to the minimum of AC, it implies that all the firms earn normal profit or zero economic profit. Or we can say that this phenomenon of entry of firms, expansion of output and falling in price will continue till profit becomes zero.

On the contrary, if in the short run the firms are earning abnormal losses, then the existing firms will stop production and exit the market. This will lead to a decrease in the market supply, which will ultimately raise the price. The price will continue to rise until it becomes equal to the minimum of AC. 'Price = AC' implies that in the long run all the firms will earn zero economicprofit.

Hence,whenthepriceisequaltotheminimumofAC,neitheranyexistingfirmwillexitnor anynewfirmwillenterthemarket and this would serve as the long run equilibrium.

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**Question 11: Listthethreedifferentwaysinwhicholigopolyfirmsmaybehave.**

**Solution :**Oligopoly in a community market occurs when there are small numbers of firm producing a homogenous commodity.

Oligopoly firms may behave in the following three ways:

i) Cartel - In order to avoid undue competition, oligopolistic firms may engage in formal agreements or contracts. This will not only allow them to maximise their total profits together,butalsocaptureasignificantmarketportion.

ii) Barrierstotheentryandexitofnewfirms-Itmayhappenthatexistingfirmstrytoadopt competitive price which restricts the entry of new firms into oligopoly market. Every producer believes in sales maximisation policy instead of profit maximisation while determiningprices.

iii) Advertisement and differentiated product - It may happen that the firms realise that price competition will leave them nowhere and consequently they emphasise more on advertising their products. It will enable them to capture the minds of consumers and indirectly increase their marketportion.

**Examples**:

1. Operating systems for smartphones and computers provide excellent examples of oligopolies. Apple iOS and Google Android dominate smartphone operating systems, while computer operating systems are overshadowed by Apple and Windows. (which is again example of Duopoly.)

2. The music entertainment industry is dominated by Universal Music Group, Sony, BMG, Warner and EMI Group.

**Question 12: IfduopolybehaviourisonethatisdescribedbyCournot,themarketdemandcurve isgivenbytheequationq=200-4pandboththefirmshavezerocosts,findthequantitysuppliedbyeachfirminequilibriumandtheequilibriummarketprice. Solution :**Market demandcurve

Q = 200 - 4p

When the demand curve is a straight line and total cost is zero, the duopolistic finds it most profitable to supply half of the maximum demand of a good.

At P = Rs 0, market demand is Q =

200 - 4 (0) = 200 units

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IffirmBdoesnotproduceanything,thenthemarketdemandfacedbyfirmAis200units.

Therefore,ThesupplyoffirmA= $\frac{1}{2}\times 200$ =100units

Inthenextround,theportionofmarketdemandfacedbyfirmBis $200-\frac{200}{2}$ =200 -100

= 100units

Therefore,FirmBwouldsupply $\frac{1}{2}\times\left(200-\frac{200}{2}\right)$ = 50units

Thus, firm B has changed its supply from zero to 50 units. To this firm A would react accordingly and the demand faced by firm A will be $200-\frac{1}{2}\times\left(200-\frac{200}{2}\right)$

= 200 – 50 = 150 units

Therefore,FirmAwouldsupply= $\frac{150}{2}$ =75units

The quantity supplied by firm A and firm B is represented in the table below.

| Round | Firm | Quantity Supplied |
|---|---|---|
| 1 | B | 0 |
| 2 | A | $\frac{1}{2}\times 200=\frac{200}{2}=100$ |
| 3 | B | $\frac{1}{2}\times\left(200-\frac{1}{2}\times 200\right)=\frac{200}{2}-\frac{200}{4}$ |

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| | | |
|---|---|---|
| 4 | A | $\frac{1}{2}\times\left[200-\frac{1}{2}\left(200-\frac{1}{2}\times 200\right)\right]=\frac{200}{2}-\frac{200}{4}+\frac{200}{8}$ |
| 5 | B | $\frac{1}{2}\left\{200-\frac{1}{2}\left[200-\frac{1}{2}\left(200-\frac{1}{2}\times 200\right)\right]\right\}=$ $\frac{200}{2}-\frac{200}{4}+\frac{200}{8}-\frac{200}{16}$ |

Therefore, the equilibrium output supplied by firm A

$$= \frac{200}{2}-\frac{200}{4}+\frac{200}{8}-\frac{200}{16}+\frac{200}{32}+\frac{200}{64}+\frac{200}{128}+\frac{200}{256}+\ldots\ldots=\frac{200}{3}\,units$$

Similarly,theequilibriumoutputsuppliedbyfirmB=$\frac{200}{3}$ units.

Market Supply = Supply by firm A + Supply by firm B=$\frac{200}{3}+\frac{200}{3}$

Equilibrium output or Market Supply =Q=$\frac{400}{3}$ units …….(1)

**For equilibrium price**

Q = 200 - 4p 4p

= 200 – Q

$$p=50-\frac{Q}{4}$$

$$p=50-\frac{1}{4}\left(\frac{400}{3}\right)\text{[from(1)]}$$

$$p=50-\frac{100}{3}$$

$$p=\frac{150-100}{3}$$

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$p = Rs\frac{50}{3}$

Therefore,theequilibriumoutput(total)is $\frac{400}{3}$ units and equilibrium price is Rs $\frac{50}{3}$.

**Question 13: Whatismeantbypricesbeingrigid?Howcanoligopolybehaviourleadtosuchan outcome?**

**Solution :**Price rigidity implies that the price is unresponsive to the changes in demand and cost in the industry.Oligopoly behaviour leads to such rigid / constant / sticky prices. Every firm in an oligopoly market is faced with a Kinked Demand Curve, the kink being at that point on the demand curve which corresponds to the prevailing common price accepted by all the firms at which they sell their output.This is because of the fact that even if any firm raises the price of its product with the motive of earning higher profits, the other firm will not do so, and the first firm will lose its customers.

On the other hand, if one firm lowers its price in order to earn higher profits by maximising its sales, then in response, the other firm may also reduce the price. Consequently, the increase in total market sales is shared by both the firms. The firm that initiated selling at a lower price may get a lower share of the increase thanexpected.

Therefore, the firms do not change their prices due to the fear of rival's reaction. They are guided by long term objectives and do not want to change the prevailing price. Hence, there is no incentive for any firm to change its price. That is why the prices are regarded as rigid prices or sticky prices.

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