Managerial Economics
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Lecture - 75
Product pricing - I

So, we will continue our discussion on price discrimination and few more types of product pricing in this session. So, if you remember in the last class, we discussed the concept of price discrimination, and this is a situation where the firm has the market power to charge different prices, to different consumer group in the different market. In that context, we discussed three types of price discrimination; one is the first degree price discrimination, where the discrimination is on the basis of the price. The basis in case of first degree price discrimination is to capture the consumer surplus from the consumer, and in that case, generally there is no consumer surplus, and there is no deadweight loss. The entire surplus goes to the producers account, and this is known as the extreme form of the price discrimination. However the difficulty in this case, in the case of first degree price discrimination. It is very difficult to assess, what is the willingness to pay for a particular product, for each consumer group, because that will only help to set the price, in order to extract the consumer surplus.

Then we discussed about the second degree price discrimination; second degree price discriminations talks about the discrimination on the basis of the quantity. So, here the basis is not the charging a different price at the different group, rather charging different price on the basis of the different quantity. And typically all the meter services like electricity, water or may be the telephone this comes under this second degree price discrimination.

Then we discussed about the third degree price discrimination, and third degree price discrimination is one; here the total market is segregated on the basis of the elasticity of demand. And the segmentation can be on the basis of the geographical, on the basis of the consumer or on the basis of the nature of the goods. And here the market, once it is segmented between two kind of market, that is elastic and inelastic market.

On the basis of the market, generally the price will be charged, whether it is a high price or whether it will be low price, and what will be good or what will be more preferred for the monopolist in order to maximize the profit. So, in the last class, we discussed that how graphically, how two prices will be charged in case of third degree price discrimination. Just to refresh again we will look at the graphical representation of the third degree price discrimination, and then we will take a numerical, to understand that how this price differs, when the price discrimination is practiced, and when price discrimination is not practiced, among two different kind of firm or two different kind of the market. So, to start with, we will have the graphical representation first, and then we will take a numerical to understand this price discrimination.

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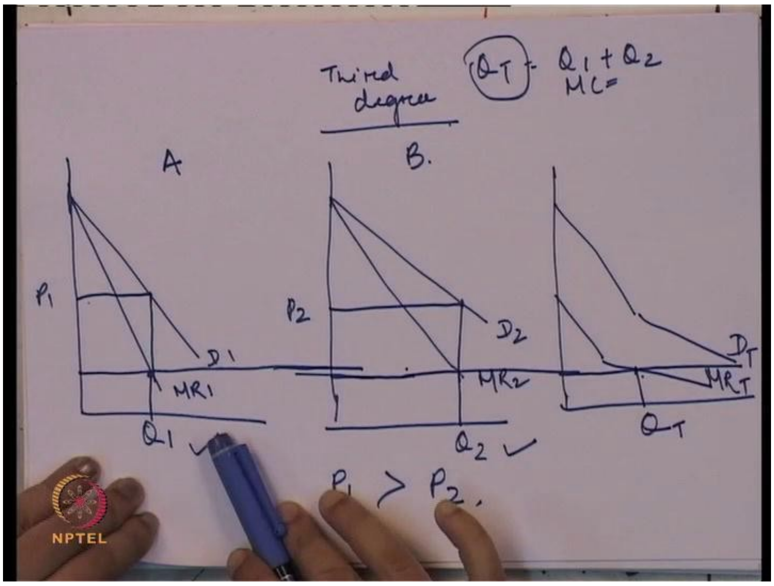

So, if you remember this also we discussed in case of our last session, when we discussed about the third degree price discrimination. The entire market is divided into two sub market, on the basis of the elasticity of demand. So, one this is where the market we can say inelastic, that is from the nature of the demand, and the other, its more elastic, this is again on the basis of the demand. Taken together, we have the total market demand and total. So, this is total market demand, this is marginal revenue of the total market. Here its elastic market, so let us call it market B, let us call it market A. We will take the MC function, where MC will be always the marginal cost, because marginal cost of producing is remain same, only the total output is getting divided between two markets, because this $Q_T = Q_1 + Q_2$, but in general the Q_2 gets produced in by 1 firm, but when its only getting sold, that time only it is getting divided into two markets; that is why we get the common marginal cost for both the firms. And on that basis, we identify the marginal cost under the basis, by the maximization rule marginal cost and marginal revenue rule, we have identified the quantity.

Now, how this total quantity will get distributed between both the markets. So, corresponding to this, we will take also the extension of marginal cost curve, in case of market A and market B. So, corresponding to this, we will get the price and quantity. So, this is the price, and this is the quantity, in case of first market. And this is the price and this is the quantity in case of the second market. So, if you look at, the P_1 is always greater than P_2. So here, what is the profit maximization rule for both the firms? For both the firms the profit maximization rule is to maximize the profit. But when it comes to how to maximize the profit, generally in case of elastic market, small change in the price generally leads a greater change in the quantity demanded; that is why the price cannot be increased here, rather here it will be a lower price will be more profitable.

But in case of inelastic market, since quantity is not going to change, even if there is a change in the price, generally the firm charges a higher price, and on that basis the quantity get distributed between both the firms; that is Q_1 and Q_2. And if you look at here, the basis of price discrimination is elasticity of demand, and higher price is charged in case of the inelastic market, and lower price is charged in case of the elastic market. So, the basis is again here the elasticity of demand, and the producer maximize the profit by charging a higher price, in case of the inelastic market, and lower price in case of the elastic market. Then we will take a numerical to understand this third degree price discrimination, how the price discrimination is, when the price discrimination is practiced, how its leads to a higher price, as compared to a price which is lower than the, when price discrimination is not being charged.

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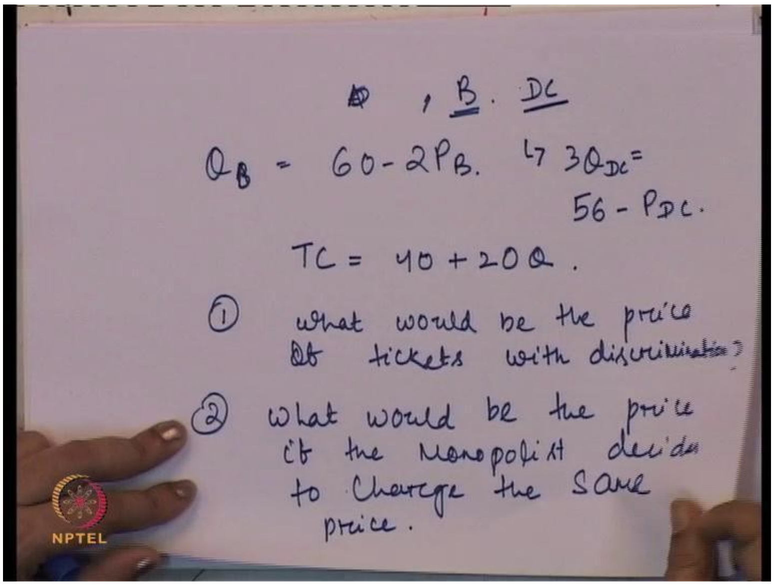

So, we will take suppose there are, we can say there are two markets A and B. So, we will take two demand function $Q_B = 60 - 2\,P_B$, or we can say this, or there are two markets; one is B, or second is may be this. So, two kind of market $Q_B = 60 - 2\,P_B$. And for this the demand function is, $3\,Q_{DC} = 56 - P_{DC}$. The total cost function is same, because it is only the market is divided for the selling the product, but when it comes to produce the product, it is the by produced by the one firm, and that is why the total cost is same. Now, we need to find out, what would be the price of tickets with discrimination, and what would be the price, if the firm or if the monopolist, decides to charge the same price there, or maybe we can when there is no discrimination. Now, let us find out the price without discrimination and price with discrimination. So, in the first case, we have a demand function; that is $Q_B = 60 - 2\,P_B$ and T_R.

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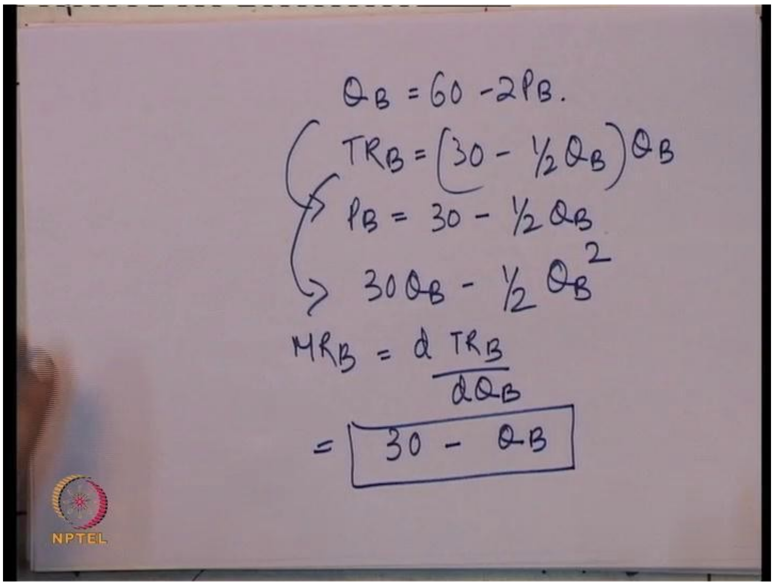

Here we need to find out the total revenue for B, and in this case what will be the total revenue of for B. First we will solve this in term of the P_B, so what will be the P_B. So, for Q_B how to find out this P_B, $2P_B = 60 - Q_B$. So, $P_B = 30 - \frac{1}{2}Q_B$. So, total revenue for B is equal to $\left(30 - \frac{1}{2}Q_B\right)Q_B$, which is equal to $30Q_B - Q_B^2$. Now, marginal revenue for B will be, this is our total revenue. Marginal revenue for B will be total revenue B, with respect to dQ_B. So, this we get as $30 - Q_B$. So, marginal revenue for B is equal to $MR_B = 30 - Q_B$. Now, what is our total cost, we will find what is our total cost.

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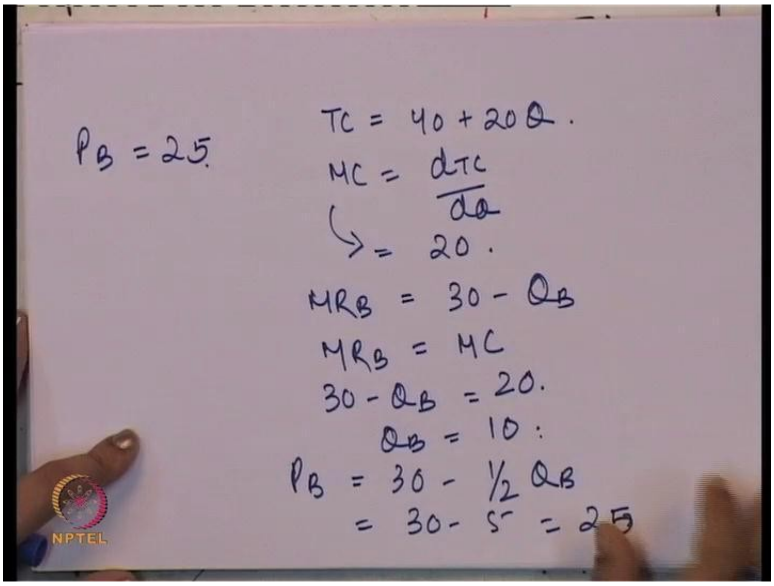

So, total cost is equal to $TC = 40 + 20Q$, and marginal cost is $MC = \frac{dTC}{dQ}$. So, that comes to 20. So, we have marginal revenue of B; that is $MR_B = 30 - Q_B$, and $MC = 20$. To find out the price we need to equalize the marginal revenue with marginal cost, so this is $30 - Q_B = 20$ and Q_B is equal to 10. So, if $Q_B = 10$, what is P_B? $P_B = 30 - \frac{1}{2} Q_B$, so that comes to 30 - 5. So, this comes to 25. So, when the price is decided individually, so in this case we get a price, which is equal to 25. Now, what we will do? We will find out, when there is a discrimination, and what is the price in that particular case?

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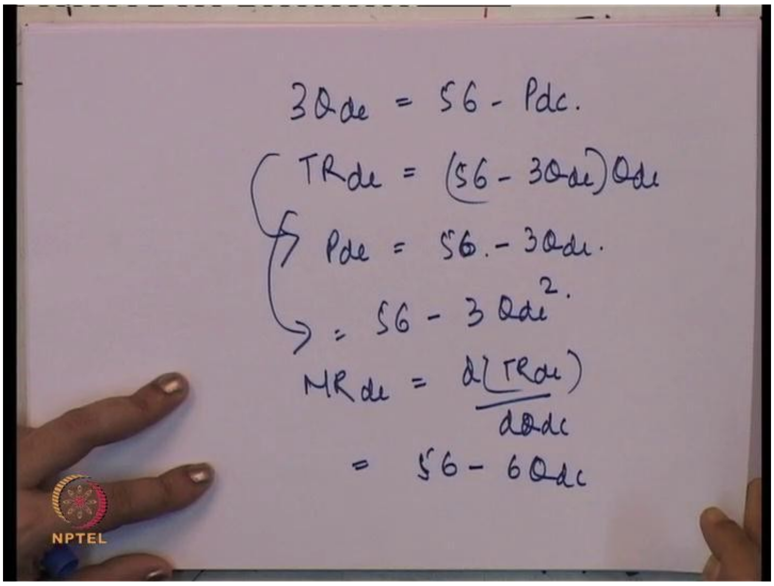

So, for that, we will take the second demand function; that $3Q_{DC}=56-P_{DC}$. and to find out the total revenue of d c is equal to, before this we need to find out the P_{DC}. So, $P_{DC}=56-3Q_{DC}$, so that comes to, T R d c is equal to $TR_{DC}=(56-3Q_{DC})Q_{DC}$, so that comes to $56Q_{DC}-3Q_{DC}^2$. And marginal revenue of d c will be; that is $MR_{DC}=\frac{dTR_{DC}}{dQ_{DC}}$, so that comes to $56-6Q_{DC}$ Now, we need to again get the price, when the price discrimination is being practiced.

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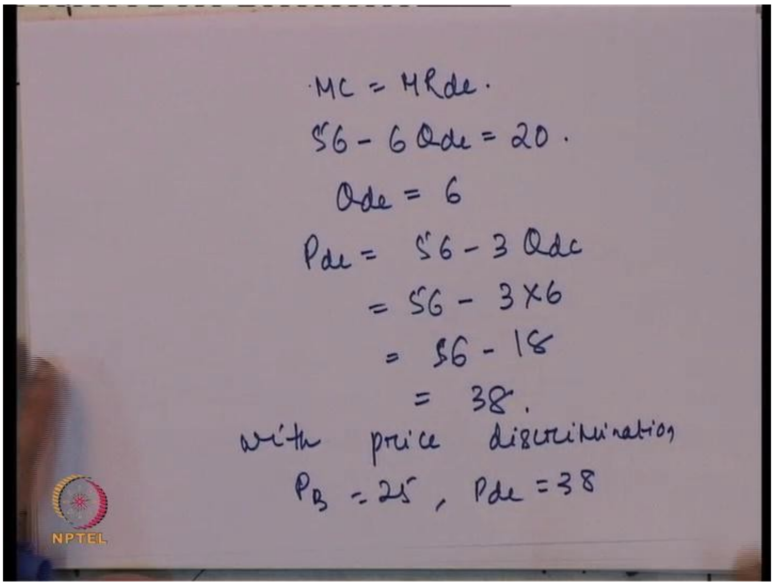

So, in this case we get, marginal cost is equal to marginal revenue; that is $MR_{DC}=56-6Q_{DC}=20, Q_{DC}=6$ and $P_{DC}=56-3Q_{DC}$. So, that comes to $P_{DC}=56-3(6)$; that comes to 56 - 18, which come to 38. So, with price discrimination, in the both the market, if there is a price discrimination, that market $P_B=25$and $P_{DC}=38$. Now, we will need to see, what is the case when there is no discrimination, why we call it is price discrimination, because in both the cases the market price is decided on the basis of the specific marginal revenue curve, and specific marginal revenue curve dependent on the, what is the elasticity of demand.

So, that is why when we are finding out the price individually of both the markets, we know that the prices are different in both the markets and that is why the price discrimination is being followed. Now, we will take together for both the market, and we will find out the price, and that price where there is no discrimination, because in the first case also when we found the price, for the specific market on the price on the basis of the specific market, on the specific MR curve; that is the price being followed in that particular market. And in this case also, when you found the price on the basis of specific MR curve, this is the price being followed in that particular market. Now, we will say if there is no discrimination, what is the price they should be following.

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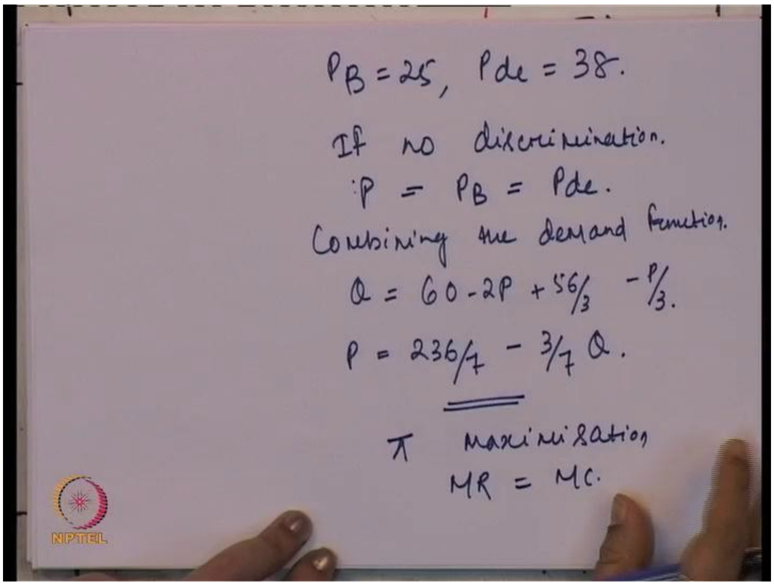

So, taking the previous case, when discrimination was being followed; that is the price by both the market. Now we will see that, there will be no discrimination what will be the price. If there is no discrimination, then we will get a combined demand curve. So, basically no discrimination means, price should be equal to the price of B, that is should be equal to the price of d c. So, combining this demand function, we will get a combined demand function taking both the markets. So, here it is $Q = 60 - 2P + 56 - \frac{P}{3}$. So, $P = \frac{236}{7} - \frac{3}{7}Q$, and this is the P for profit maximization, we require for profit maximization, we require the marginal revenue and marginal cost. So, next we will find out the marginal revenue.

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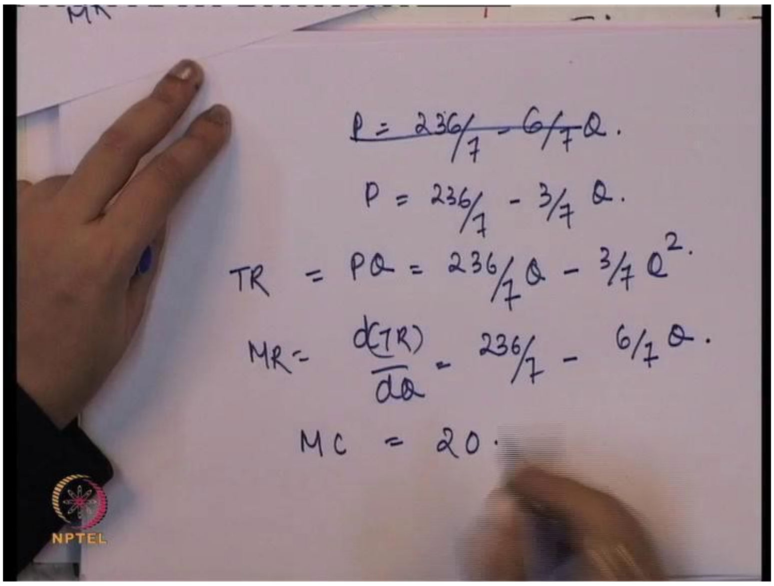

So, now we have $P = \frac{236}{7} - \frac{6}{7}Q$, and 6 by 7 Q this is the. sorry this is $P = \frac{236}{7} - \frac{3}{7}Q$. Now what will be the PQ, PQ is, which is equal to the total revenue. So, this is $TR = PQ = \frac{236}{7}Q - \frac{3}{7}Q^2$. To find the marginal revenue, we will take the derivative with respect to Q. So, this comes to $\frac{236}{7} - \frac{6}{7}Q$. So, this is our marginal revenue, and we know marginal cost is equal to 20. Now we will take the marginal equality between the marginal revenue and the marginal cost.

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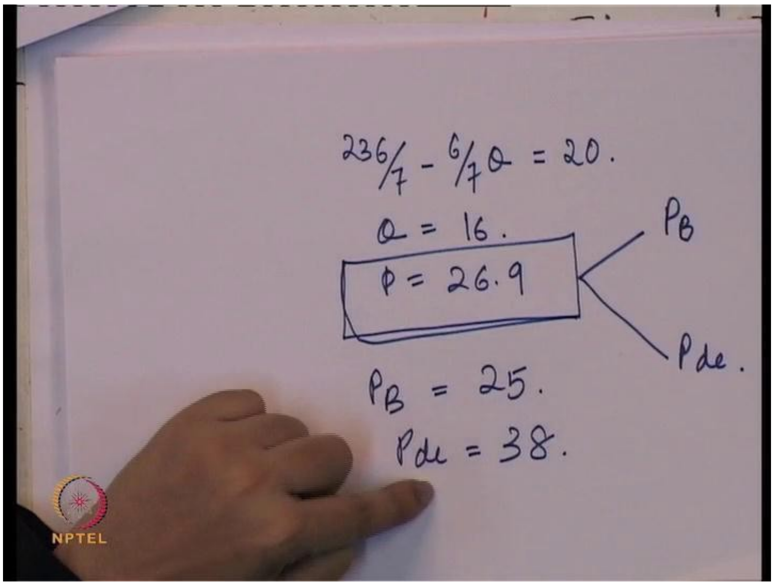

So, marginal revenue is equal $MR = \frac{236}{7} - \frac{6}{7}Q$, which is equal to 20 as we know that marginal cost is equal to 20. So, solving this we will get Q is equal to 16, and putting the value of Q here in P equation we get P is equal to 26.9. So, this is the price, which is going to followed by the price of B, and this is also the price of the other firm, other market. It means when there is no discrimination, they are charging a price that is 26.9, and when there is a discrimination they are charging price 25, and they are charging a price that is 38. So, if there is a discrimination, this is the price that is going to be followed by both the firm that is B and d c, but if there is discrimination by specific firm, B charges 25 for the price, and d c charges 38 for the price. So, the point here, what to remember here is that, they always, the monopolist they check for the price level, where they can maximize the profit, and on that basis they fix up the price in the both the market, whether its elastic or inelastic. Generally, in case of inelastic they charge a higher price, and in case of elastic they charge a low price. Then, we will discuss about this, international price discrimination and dumping. So, till now we have understood the price discrimination from the point of view from the concept and from the theory.

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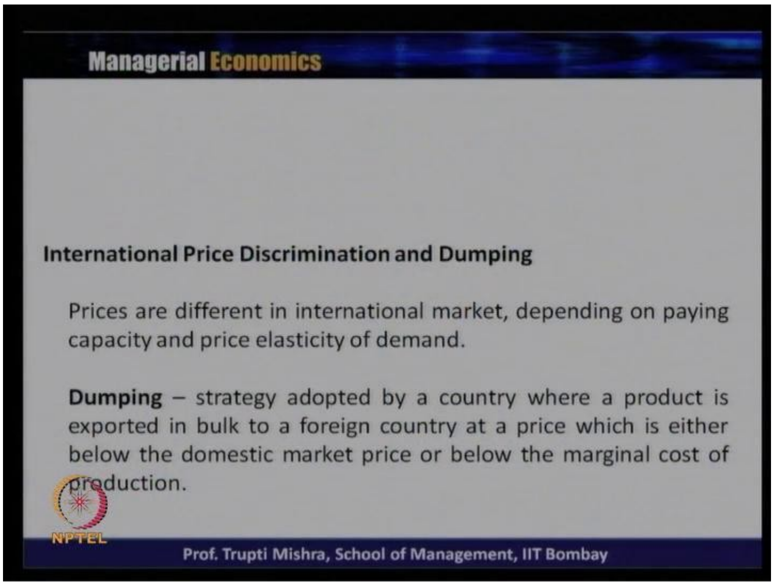

Now when this price discrimination is followed in the international market, we will see what is the outcome and how that can be taken. So, international price discrimination generally if you look at, prices are different in different international market for the same product, and why it is different, because it depends on the paying capacity and the price elasticity of demand. So, it is different in the different international market, for the same product, and why it is different because different economy has a different paying capacity, and also they have a different price elasticity of demand. Some market is more sensitive to the price, some market is less sensitive to the price, and this is when it is done deliberately when the prices are different in the different market, and when it is done deliberately generally we call it is a the strategy, generally known as dumping. And dumping is the strategy adopted by a country, where product is exported in bulk to a foreign country at a price, which is either below the domestic market price or below the marginal cost of production. So, what they do in case of dumping. In case of dumping, generally they adopt a strategy, where the country export the product in a bulk, and the price what they follow that is less than the domestic price, and below the domestic price, and below the marginal cost of production.

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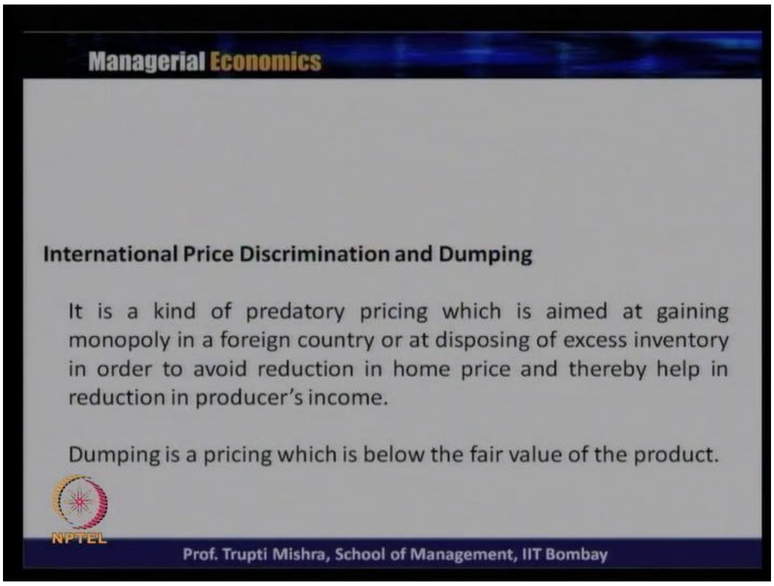

Now, what is this dumping, if you look at, this is a kind of predatory pricing, or a kind of price low price what they follow, which is aimed at gaining monopoly in a foreign country, or at disposing the excess inventory. So, why generally this is done, why the export is at the bulk at a less than the domestic price, because it is a kind of predatory pricing, and what is the aim of this pricing. Generally they will gain monopoly in the foreign country, because they are sending it in the bulk, and also they are charging a lower price to this. So, either they try to gain a monopoly market, they will try to get a monopoly status in the international market, or to dispose the excess inventory in order to avoid reduction in home price, and thereby help in reduction in the producer's income also.

So, either they try to become the monopolist, or they try to dispose the excess inventory. Suppose it has been produced much in the home country, and in order to avoid that reduction in the home price, thereby help in the reduction also producer income. So, if they have already produced, they have that in the inventory, they try to dispose the excess inventory. So, that they can avoid the reduction in the home price, rather than charging a lower price at home, and thereby help the reduction in the producer income. So, what is the gain from the producer point of view, they are giving, they are, either they will get a monopoly status, or they try to disposes whatever their excess inventory, and in that way it helps to increase the producers income. And generally dumping is also known as, the fair value product, the pricing which is below the fair value of the product, because they are exporting in the bulk in the typical economy, where the price is lower than even whatever is being charged as the domestic price.

Ideally, when we export something we export at a higher price, because it also involve, apart from the price it also involve the transport cost of putting from one economy to the another economy. But in case of international price discrimination in case of dumping, it does not happen in that way, generally it is bulk is given in the lower price, and the motivation is to either become a monopolist, or gaining a monopoly in the foreign country, or reduce the excess inventory in the home country. But whenever this dumping is not legal, whenever this dumping is being done, it is generally protected by the economy; that none of the economy or none of the foreign economist would come and dump it in the home economy, because when they are charging something less than the domestic price, there is always a question about what is the quality of the product.

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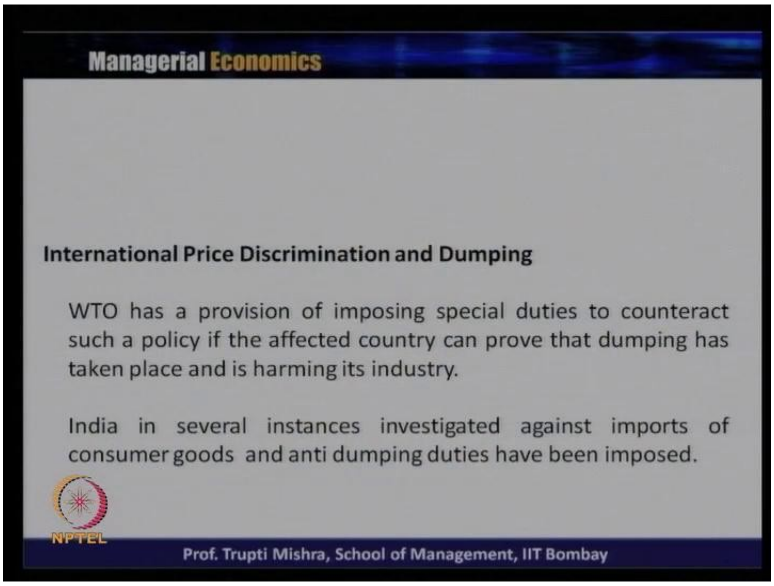

So, world trade organization, they has a provision of imposing special duties to counteract such a policy, if the affected country can prove that dumping has taken place and is harming its industry. So, WTO world trade organization, they have certain rule for this or they have certain law for this, and they have a provision of imposing special duties, if such kind of dumping is happened, and in that case the affected country they have to prove that, the dumping has taken place and its harming it is industry. Generally, if you look at in the Indian market, china always try to dump the low value product in the Indian market, and in that way they try to gain the monopoly. Now also if you look at, the toys the plastic product it is over flooded, as it comes from the china economy.

It is the entire the plastic or the toy industry is over flooded with the Chinese product. So, India in several instances, they have investigated against the import of the consumer goods, especially from china, and there are also instances that there is anti dumping duties have been imposed. So, dumping, when it comes to dumping, it is always a, if it is being proved, then it is not a healthy way of the pricing or healthy way of doing the trade, and that is why dumping is not legal, and if the dumping is found, generally there is a special duties provision from world trade organization. Then we will take a case of Indian railway, and we will try to analyze, because if you look at, try to analyze whether they have the price discrimination or not.

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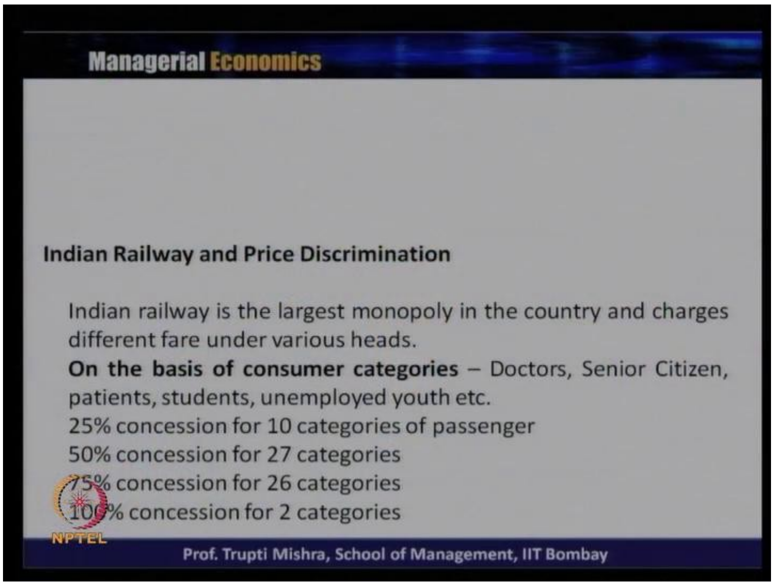

Because, if you look at Indian economy is such that, in this case we always consider they are the largest monopoly, this is the regulated monopoly. And since this is a regulated monopoly, they have freedom about their prices, and they charges the different fare under various heads for this, different kind of services. Now on the basis of this, consumer category we will see, on what basis generally they discriminate. On the basis of the consumer category, if you look at there is special fare for doctors, senior citizens, patients, students, unemployed youth, and even for the kid. So, they give 25 percent concession of 10 categories of passenger, 50 percent concession for 27 categories of passengers, 75 concessions for 26 categories, and 100 percent concession for 2 categories. So, here what is the discrimination. The discrimination is among the different kind of consumer, and on that basis they generally get the concession. Like if it is unemployed youth or students, they get 100 percent concession. If they get only 25 percent concession, may be this is for a specific category of the consumer. Similarly if it is senior citizens they get 50 percent concession. So, on the basis of the different kind of consumers, generally they offer the concession and we can say that, here the discrimination is on the basis of the, different consumer group, not on the basis of the any other factor over here.

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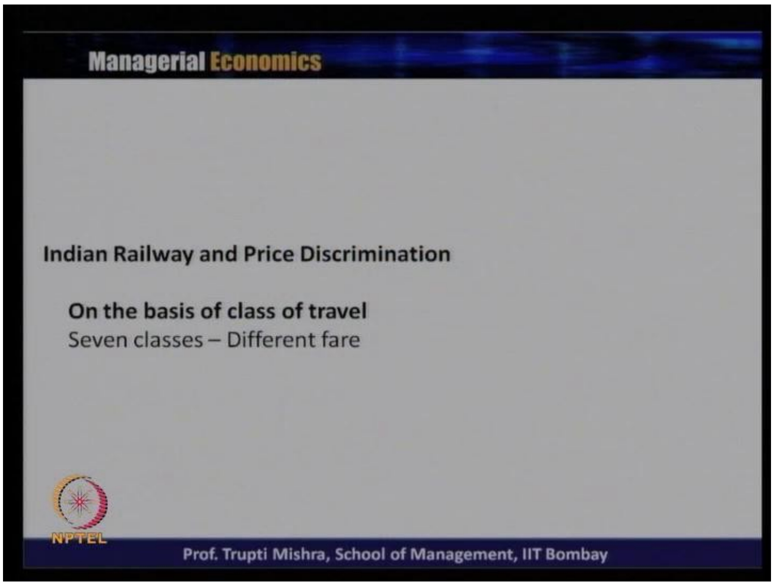

Then on the basis of the class of travel. So, if you look at, there are seven classes, starting from unreserved class to the sleeper class to the third AC to the second AC to the first AC. There are total 7 classes in the, 7 class; like with sitting, it is AC sitting. There are 7 category of services offered to the consumer. And here for each category it charges a different prices or different fare. Of course, the comfort associated with the different classes are different, but still as a whole if you look at its one product, and for that product, because anyway its we are using, it is a mode of travel. And in case even it is a mode of travel its one class still the different prices are charging, on the basis of the different classes being offered in the train journey, then on the basis of the category of train.

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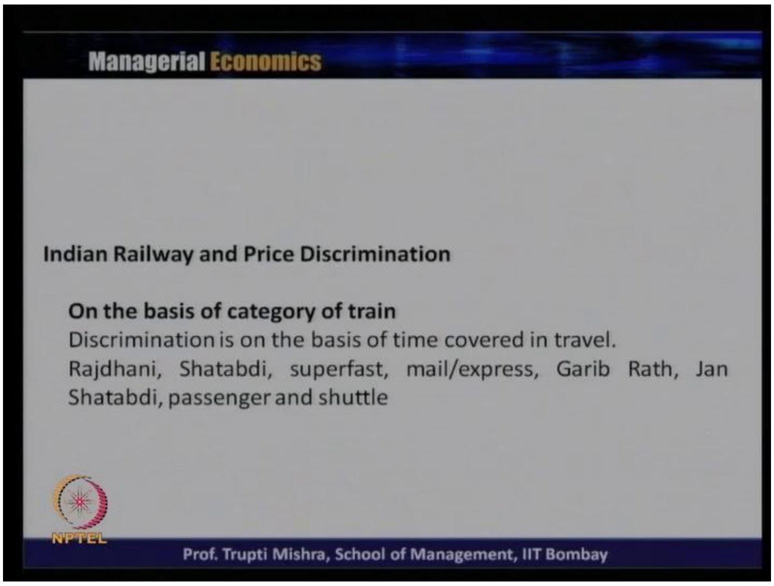

So, discrimination here is, what is the big difference, if someone is travelling by Rajdhani, someone is travelling by passenger, someone is travelling by mail and express. Here the discrimination is on the basis of the time covered in the travel. Rajdhani takes the lowest time or may be the passenger takes a highest time. So, in this case, since the consumer is able to reach in a less time, he is being charged for that. Or if the consumer is travelling through passenger train, and there is no there is he is taking his, may be higher time to reach the destination, he is getting a concession for this. So, in this case if the train service is offering a seat in the Rajdhani, he is charging for it, but if he is in the passenger, I think he is just charging the normal fare, what is applicable for a railway as a mode of travel. So, here the discrimination is on the basis of the time taken by the train, to cover the entire distance or cover the travel distance. Then also the entire, if you look at this entire thing can get, what is the services associated with this. If you look at its not classes may to the also services associated with it. If it is food then, may be a special fare for it. If it is bedding, because if you are travelling in AC, if they are giving bedding, so that cost is included in the ticket. So, different classes, different consumer group, and also different category of train, on the basis of that Indian railway generally practice the price discrimination.