Economics, Management and Entrepreneurship
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Lecture – 02
Market Equilibrium: Demand and Supply

Good morning, Welcome to the second lecture of Economics, Management, and Entrepreneurship.

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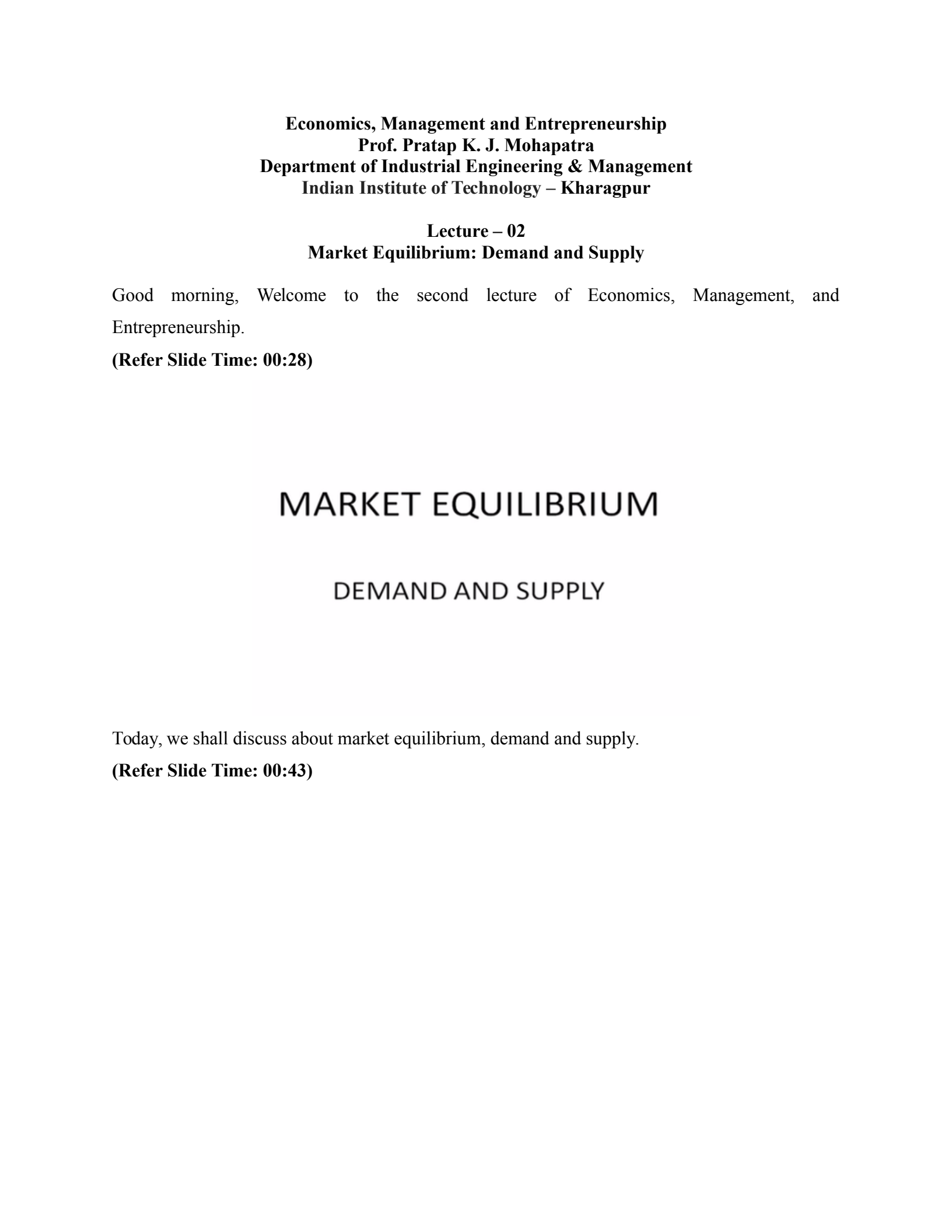

Today, we shall discuss about market equilibrium, demand and supply.

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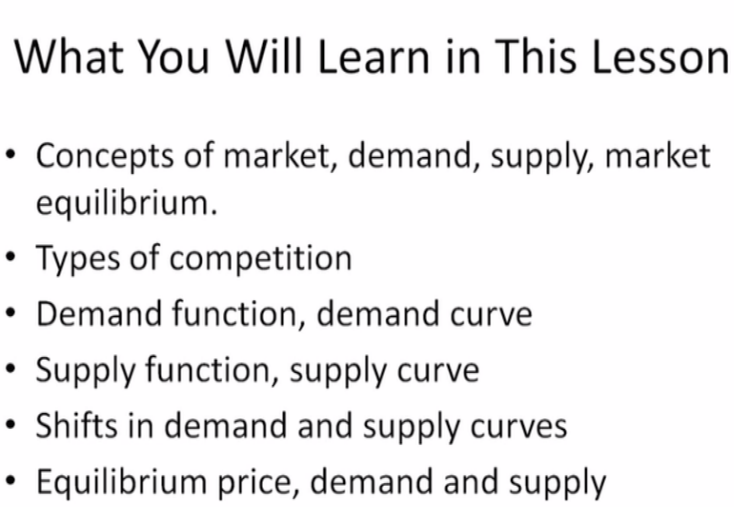

Here, we shall study various things and you are expected to learn the following concepts: Concepts of market, demand, supply, and market equilibrium. Each one of these concepts will be elaborated in terms of types of competition that can exist in a market, concepts of demand function for the whole market, and demand curve.

How demand curve is related or is different from demand function similarly, we shall also discuss supply function and supply curve and so how these 2 are related. We shall also study 6 in demand curve and supply curve because of effects of different factors other than price and finally we shall find out price, demand, and supply when the market is in equilibrium. So let us study these concepts 1 by 1.

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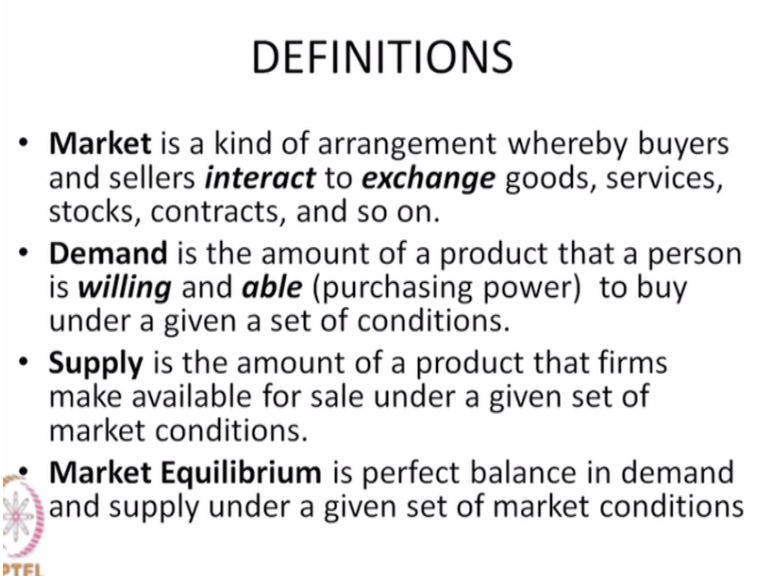

To start with we consider certain definitions. Definitions on what a market is all about what we mean by demand, what we mean by supply, and what we mean by market equilibrium. These definitions will be definitely elaborated as we proceed in course of the lecture. First, what actually is a market? A market is a kind of arrangement whereby buyers and sellers interact to exchange various types of things such as goods, services, stocks, contracts, and so on.

The key terms here are the buyers and the sellers and their interaction and the way the exchange, the commodities, such as goods, services, stocks, and so on and so forth. Later, we will study how in market characteristics may change because of different types of competitions that can come in a market. Second definition that we would like to give is demand what exactly be mean by demand.

Demand is basically the quantity of a commodity or the amount of a product or service that a person is willing and able to buy under a given sort of conditions. Now these are the 2 key words, willing, and able. The person must be desires of acquiring a product and must have sufficient purchasing power to be able to acquire the product so these are the preconditions, his willingness and his ability to buy, under a given set of market conditions that is the demand.

Supply on the other hand is the quantity of a product or service that firms make available to the market for sale under a given set of market conditions. So supply is basically the amount of

goods or service that the enterprises in a market that is the sellers in the market supply. Now when there is a perfect balance of demand and supply in a market we say that the market is in equilibrium. Perfect balance means the demand = supply.

There is no excess supply and there is no scarcity of supply. Demand and supply are equal they match with each other. Now these are the basic definitions with which we shall proceed further.

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To start with let us try to find out to different ways in which the competition can take place in a market. We say that the market can have perfect competition. In the next slide, we will give various characteristics of perfect and imperfect competitions. Imperfect competitions could be monopoly, monopolistic competition, oligopoly, bilateral monopoly, monopsony, and oligopsony.

We will discuss in our next slide the various characteristics of perfect and of different types of imperfect competitions that are listed here.

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CHARACTERISTICS OF COMPETITION TYPES

Types of Competition	Buyers	Sellers	Product	Knowledge	Freedom of Entry and Exit
Perfect Competition	Many	Many	Homogeneous	Perfect	Complete
Monopoly	Many	One	- do -	- do -	Restricted Entry
Monopolistic Competition	Many	Many	Differentiated (Brand Names)	- do -	Complete
Oligopoloy	Many	Few	Homogeneous/ Differentiated	- do -	Restricted Entry for Sellers
Bilateral Monopoly	One	One	Homogeneous	- do -	
Monopsony	One	Many	Homogeneous	- do -	Complete
Oligopsony	Few	Many	Homogeneous	- do -	Complete

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We would like to fist of all write down or speak about characteristics of competition types. We would like to in our first column we write down the different types of competitions that we listed in our earlier slide and in the other columns we write the various characteristics in terms of the number of buyers, the number of sellers, and the feature of the product, knowledge about the product, and freedom of entry, and exit of buyers and sellers in the market.

Depending of these characteristics we shall define and we shall explain different types of competition. To start with let us take the condition of the case of the perfect competition. In case of perfect competition, the number of buyers is many, number of sellers is many. Large number of buyers and sellers interact in the market in case of perfect competition. The product is homogeneous.

We cannot distinguish 1 product from another and the buyers and the sellers have perfect knowledge about the product and anybody can leave a market without buying or can enter the market for the purpose of buying. Therefore, there is complete freedom as far as the entry and exit of buyers and sellers to the market are concerned. Now these are the different conditions which should exist in a market to call that market a case of perfect competition.

The next case is a case of monopolistic situation, where there is a monopoly. It means that the supply or the seller is only 1. Only 1 supplier is there to the market. No other supplier exists for

that product, but there are a large number of buyers. So naturally the situation here is different, because there are large number of buyers and only 1 supplier, the buyer or the seller has got the freedom of almost deciding the price.

The buyers really cannot put much influence on the price of the product. On the other hand, in case of perfect competition, the market determines what the price of a product would be. No seller can influence the price at all and the other ones the feature of the product, the knowledge about the product, they were in case of perfect competition however in case of freedom of entry to the market it is restricted because it is dominated by only 1 supplier, any other supplier coming the entry is restricted not by anybody.

But purely because the likely competitor many not have the advantage or may not actually compete with the monopoly therefore there is an artificial barrier to the entry of the competitor to the market. This is a case of monopoly or monopolistic competition. Next, we come to the case of monopolistic competition and the other one was monopolistic situation. Monopolistic competition is a case like a perfect competition where there is a large number of buyers and large number of sellers however the products are differentiated.

Differentiated means there are different brand name. They serve the same purpose. The same product as well as a (()) (12:25), but in certain respects their specifications are different and the functionalities of the product as they give the service to the customers may differ, their size may be different, their capacity may be different, so in different brand names, the same product could be sold by different suppliers.

So this is a case of monopolistic competition and as far as knowledge about the product or the freedom of entry and exit to the market or concern they are same as that of perfect competition. We come to the next type of competition which is oligopoly. In case of oligopoly, we have many buyers, a large number of buyers, but only 2 or 3 sellers. So in this case, usually the product could be homogenous or could be differentiated.

So there could be different cases. Entry is however I am sorry it is not written there. The entry is mostly restricted because there are only few restricted entries for sellers. So that is oligopoly and next is bilateral monopoly. In this case, we have only 1 buyer and 1 seller and product is homogenous and the freedom of entry is restricted completely. The other 2 types of competition exist in the input market.

Input market means in the raw material market, we supply raw materials to the producers. So in the input market there can be a situation of what is known as monopsony where there is only 1 buyer, a large (()) (14:43) steel plant let say where the sellers are many, many ancillaries are supplying material to the steel plants. So this is a case of monopsony. The products could be homogenous and the knowledge about the product is completely available.

And anybody can come in particularly the supplier can always enter the market in any number without any restriction. The other one is oligopsony which means that there are only few buyers, but many sellers and other conditions the other conditions are exactly similar to that to the case of monopsony. So this table gives the different types of competition that can happen that can occur in a market and their characteristics.

Now economic theories exist for different types of cases in this lecture or in this course we are not going to discuss everything, but we shall consider the case of only the case of perfect competition. With this we carry on to our next slide.

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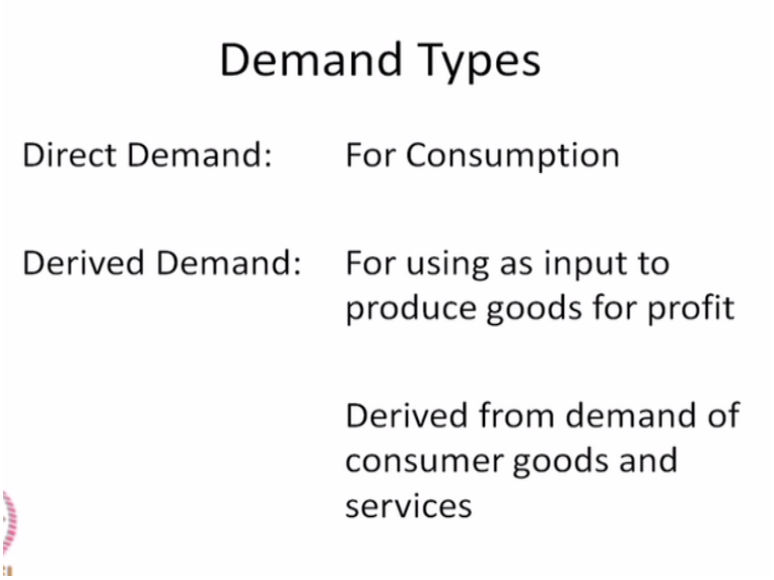

The next slide is about different types of demand. Basically, we can categorize demand into 2 types, 1 direct demand, demand for consumption. That means we buy we use it and it is totally consumed so all consumption items such as rice, etc., etc. they are for consumption. Consumer product basically whereas there could be derived demand and it is for using as input to produce goods for profit.

For example, all raw materials that are supplied to different enterprises their demand is derived demand, because that will depend on the type of product the funds produced and the demand for the products that the firms produce are basically the direct demand by consumers and depending on the production the amount of input material required by the company will be determined and they are therefore derived from the consumption demands of the consumers.

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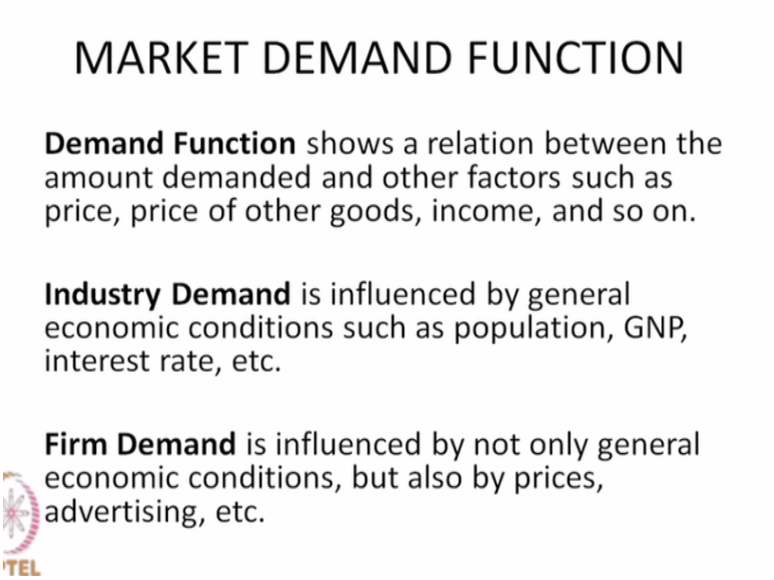

Next we talk about market demand function. What we mean by the demand function. Demand function basically we try to find out some sort of a relationship between the quantity demanded in the market and some factors that we feel determine the demand for the product. For example, it may depend on price, price of other goods, competitors' goods, income of the people, and so on and so forth.

We then say that this is a demand function basically demand as a function of various factors that we can think and we specify that in the form of an equation or of a graph we call it a demand function. Demand function can exist at the level of an industry or at the level of a firm. When we talk about an industry demand generally the demand for a product in that industry that is for all firms put together in that industry is generally influenced by general economic conditions such as the populations, grossness national product, national income, interest rate, etc.

Whereas the demand for a product by a particular firm will depend not only on the industry demand, but also on the price that the company fixes for its product, the advertisement, and various promotional measures that the company takes and other such factors such as after service conditions that it provides to the users when the product is in service and so on and so forth. Now, in our next slides we will talk more about these demand function.

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EXAMPLE OF A DEMAND FUNCTION

$$D = 10 - 2P + 2I + 0.9Ps + 1.2A$$

D:	Demand (unit/year)
P:	Price of the product (Rs/unit)
I:	Disposable income (Rs/year)
Ps:	Price of a substitute (Rs/unit)
A:	Advertisement expenditure (Rs/year)

This is an example of a demand function where we have written down a linear equation showing a hypothetical case of demand depending on price P, disposable income I, price of a substitute product Ps, and the ext of advertisement expenditure that the company incurs. So this is probably derived such an equation could be derived from actual data to be collected from a market.

So demand is unit per year, price of the product is rupees per unit, disposable income is rupees per year for the compute population, price of a substitute in terms of rupees per unit, and advertisement expenditure in terms of rupees per year. Now look at the signs, some are +, some are - . If you look at the sign associated with price P it is - it means that has price of the product increases demand is likely to fall. So this is shown by - sign, or rather - sign comes because of this relationship.

Similarly, if we look at disposable income I the associated sign is + it means the direction of change in I gives rise to the same direction of change in D means as income increases demand for the product also increases. Look at Ps price of a substitute. If from a given condition price of a substitute increases, then demand for year product also will increase because people will prefer most likely they will prefer your product rather than the substitute product because it now costs more to them and lastly advertisement.

If you spend more on advertisement if in general all companies paying more on advertisement, then a demand for the product is likely to rise. We are talking about the demand function it means all the variables including price are affecting or influencing the demand and such relationship is shown in a function in an equation form. Also of importance to notice is the value of the coefficients.

The coefficients are 2, 2, 0.9, and 1.2 for these 4 variables. They are basically a 1-unit increase in price is expected to raise demand by 2 units. So this meaning of 2, 2, 0.9, and 1.2 are this. This means the effect of price is more because the coefficient of P and I. They are very high because the associated values are 2 that are larger compared to 0.9 and 1.2. So these are certain implications of this demand function.

Now to derive this demand function it is necessary to collect data, and to regress the demand value with the values of the different variables P, I, Ps, and A to be able to estimate the value of the parameter, the intercept value 10 and the coefficients of the regressors 2, 2, 0.9, and 1.2. In course of our series of lectures we shall talk about regression in more detail where various concepts will be discussed and will be clarified further.

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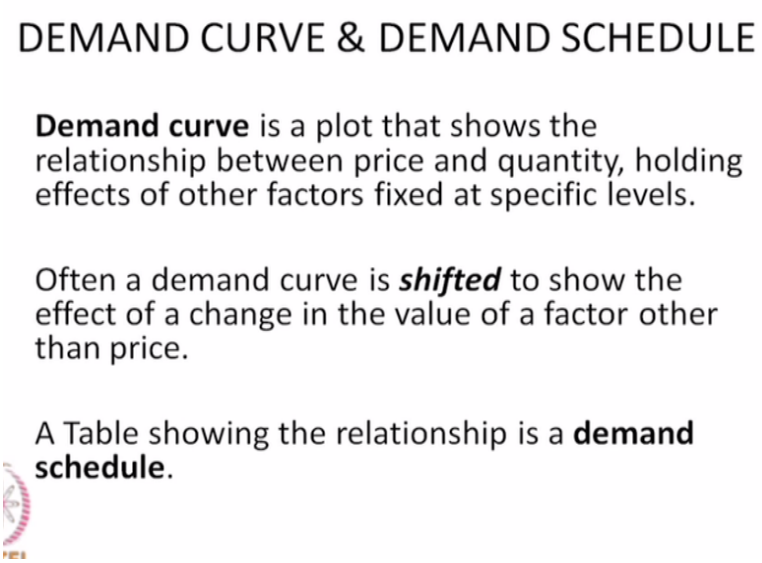

We now talk about demand curve and demand schedule. In the last slide we talked about demand function. A demand function says demand D is a function of not only price, but several other

variables, but suppose that we take only price as the cause of variable that causes demand, and so relationship between demand and price and plot it then this plot is called a demand curve.

A demand curve is a plot that shows the relationship between price and quantity holding effects of other factors fixed at specific levels that means we assume that other factors are not changing. Only price is changing then how demand is affected because of a change in price that we say. And when we plot it we call it a demand curve and when we show values and put values in a table such as this we call it a demand schedule.

When we plot it, we call it a demand curve and when you show that in the form of a table we call it a demand schedule. Now as I was telling you a demand curve shows how demand changes with only one variable and that is price. We can also draw separate demand curves showing how demand changes with price, but how when a particular some other factors changes its value from 1 to the other then we say that the demand curve had shifted.

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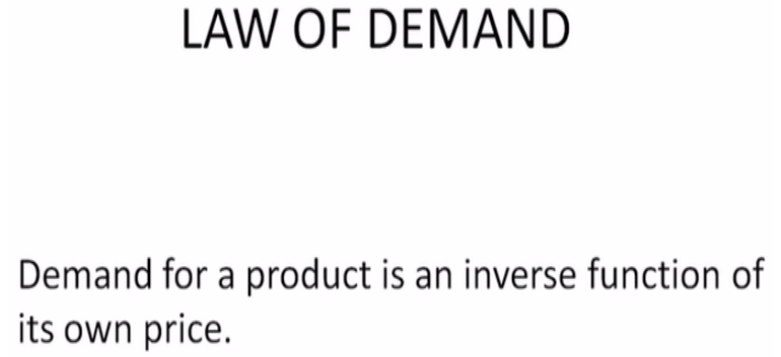

This we shall now, but before that there is what is known as a low of demand in the theory of economics and this is called demand for a product is an inverse function of its own price that means as price increases, demand falls and as price reduces, demand rises. This inverse relationship between demand and price is called the law of demand in economic theory.

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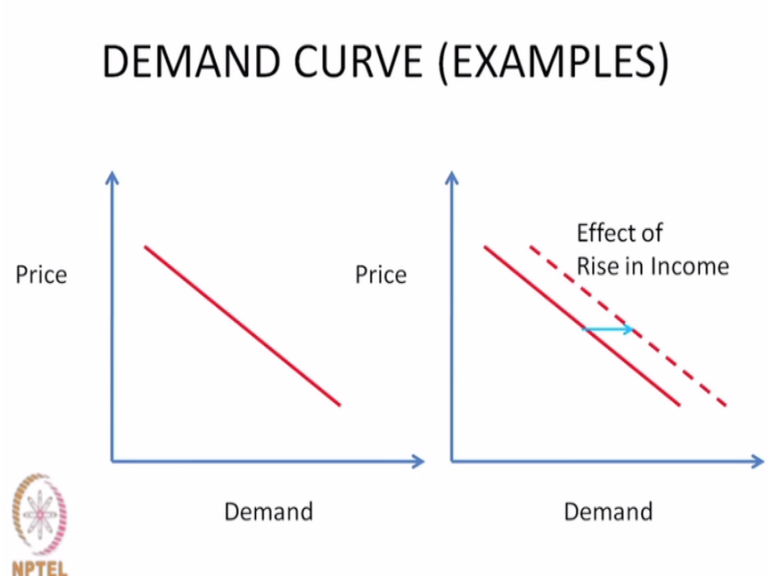

We now show 2 examples of demand curve. We show here the first curve shows how demand changes with price. We show here that as price reduces demand rises or as price increases demand falls. So this is that inverse relationship or it has a negative trend between price and demand and in this diagram we show suppose that some other factor such as income in the country has gone up say the general income level of population in a country goes up.

Then, the demand curve will be shifted to the right or if it comes down then this demand curve will be shifted to the left. This is how effect of some other factor other than price can be shown in the same graph.

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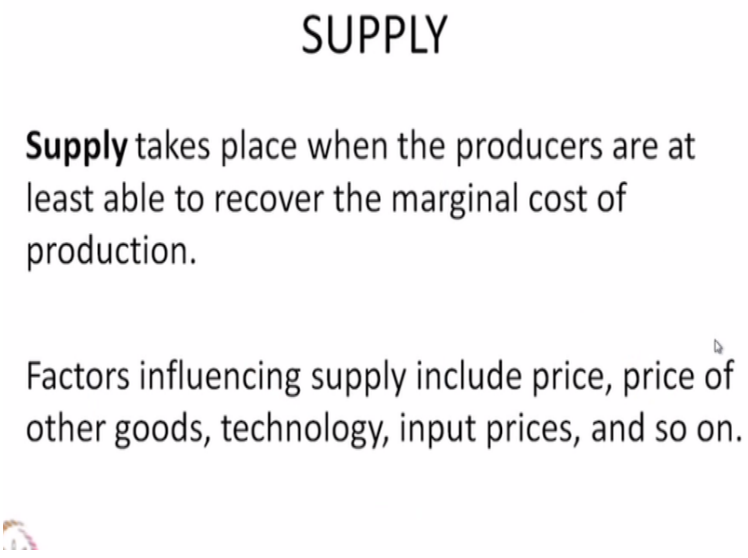

Now we come to the case of supply. Supply takes place when the producers are at least able to recover the marginal cost of production. We will talk about marginal cost in more detail later, but basically there should be able to recover the additional cost of producing 1 unit that means that the price of the product at which they sell their product to the market should be = the incremental cost of production if they produce 1 unit of product.

This we shall elaborate as I say later for the time being I would like to say that supply will take place when producers are at least able to recover their marginal cost. Like demand, there are several factors that affect supply. The principal factor though is the price that realize when they sell their product. Apart from that there are other things such as the raw material price which we have written here as input price, the raw material price, the technology.

Because technology will affect the cost of production or the productivity, and price of substitute or other complementary goods and such other factors that can affect the supply. So there can be large number of factors, but in economic theory and as we can well realize price is the most important factor, most dominant factor that influences supply.

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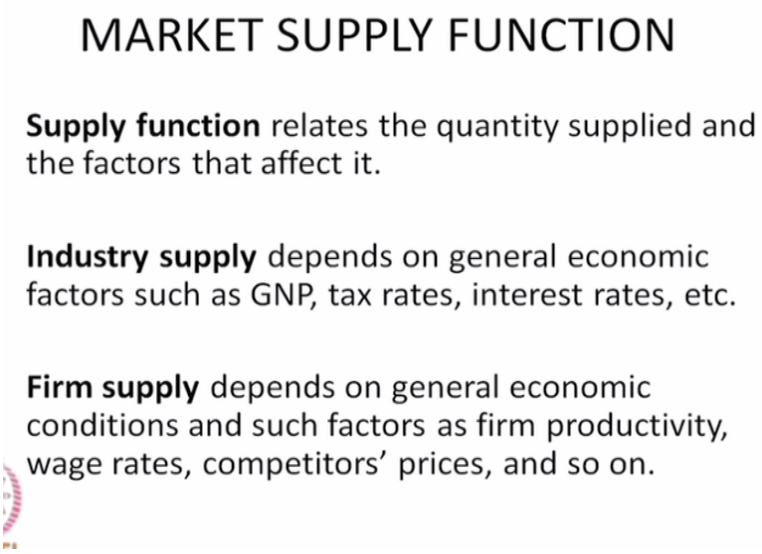

Now like we did in case of demand, we also would like to talk about market supply function. So here market supply function will relate to quantity supply by all firms put together and the factors that affect it, the factors as I said will include various factors not just 1 and accordingly

we can just as we did in case of demand in case of supply also we can have industry level supply that means all firms in an industry supplying same or similar goods to the market to satisfy the customer demand or supply for a particular firm.

So, we distinguish industry supply from firm level supply. Now, industry supply will depend on various general economic conditions and economic factors such as gross national product, interest rates, tax rates, population so on and so forth. Whereas firm supply will not only depend on these general economic conditions, but it will also depend on such other factors like its own productivity, the wage rate that they are giving, the competitors' prices, and so on and so forth.

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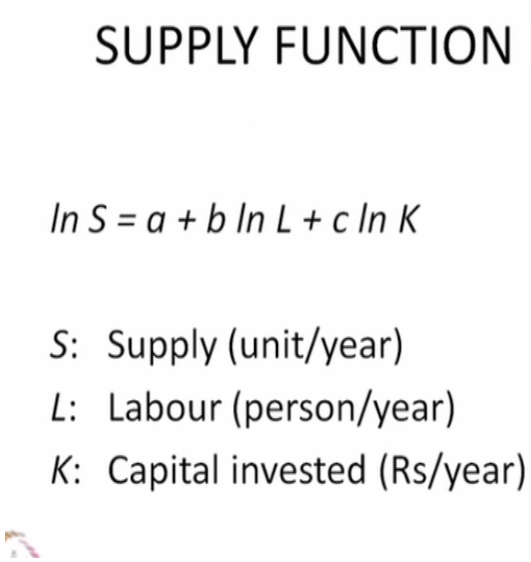

Now just we had demand function similarly we can have supply function. In the previous case of demand function, we had assumed a linear function. Supply function in the short term can be linear, but in a long term it usually takes a log linear relationship. In this case, we have taken ln S that is natural logarithmic of supply = a constant a + b * natural logarithm of L + another constant c * natural logarithmic K.

K and L are taken here as factors, L for labour, and K for capital. Labour is usually not person, but person month, or person day per year there is a mistake here. It should be person day per year. Capital invested is rupees per year and supply is unit per year. This is a log linear

relationship in economic theory. Such relationships are known as Cobb-Douglas production function.

We will discuss more about production after 1 or 2 lectures in detail. Basically after a log transformation, this is a linear function, this is a linear equation and therefore we can still use multiple regression methods to estimate the parameter values A, B, and C and we can make interpretations like the way we made earlier.

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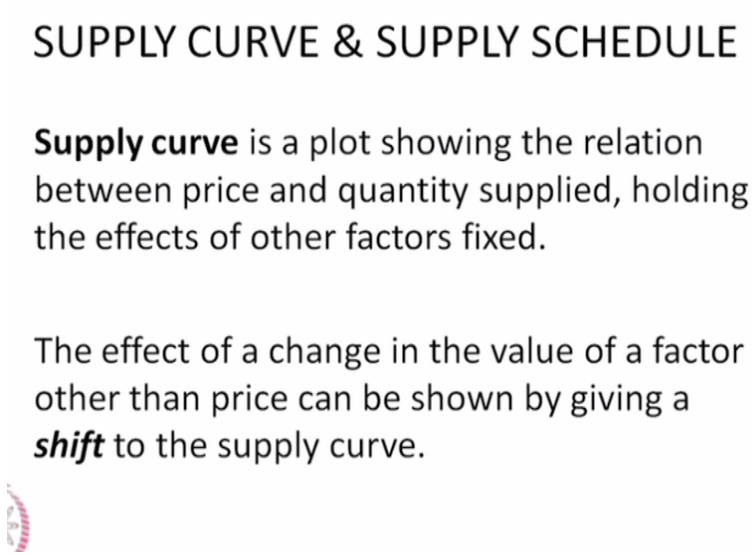

Just as we had drawn the demand curve, similarly we can also have a supply curve and likewise we can have the supply schedule. Supply curve is a plot that shows the relationship between price of the product and the quantity supplied holding the effects of other factors fixed. So supply curve is basically relationship between quantity supplied and the price and here also we can show the effect of another factor changing its value by shifting the supply curve.

Just as we had done in the case of the demand curve and although not written here a supply schedule is basically a table containing 2 columns where the corresponding values of quantity and price are written down in a tabular form. This is a supply schedule and just as we had a demand schedule.

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LAW OF SUPPLY

Supply of a product is a positive function of price, other variables remaining unchanged.

Similar to the law of demand we also have a law of supply that says that supply of a product is a positive function of price other variables remaining unchanged. It means that if price is the sole determinant of supplier then as price of the product in the market rises it motivates the supplier to produce more goods and supply them to the market. Therefore, there is a positive relationship between supply and price.

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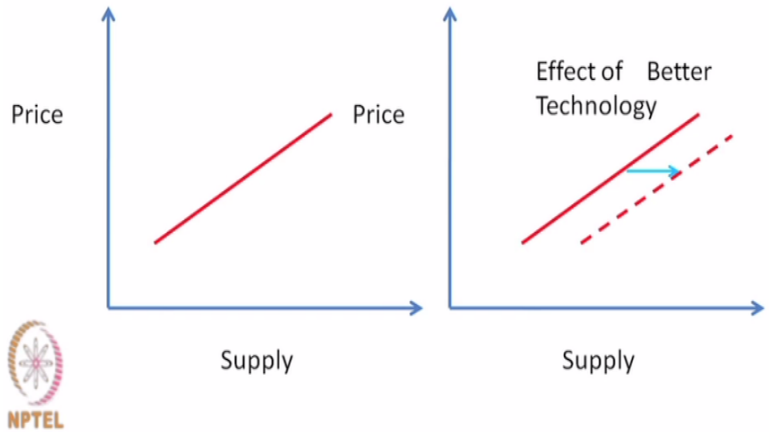
SUPPLY CURVE EXAMPLES



Now these are 2 examples basically the first one shows how supply rises as price rises as I said as price rises it motivates the producer or the supplier to produce and supply more quantity of goods to the market therefore it has a positive trend in contrast to a negative trend that exist in the case of a demand curve. Now in the second example, we are showing suppose that the

company adopts a more productive technology that means giving the same input it is able to produce more amount of money at a less cost therefore under this situation for the same price the supplier will be higher.

It means that the supply curve will shift to the right. The supply curve is shifted to the right, it may also shift to the left that means we can have a line drawn here and this case will arise for a condition let us say that supply, the wage cost has gone up. If the wage cost goes up, then the cost of production will go up therefore the profit margin for the same price will come down and if the profit margin comes down the motivation for producing more may not be there and therefore supply may go down. So in this situation we can have a left shift of the supply curve.

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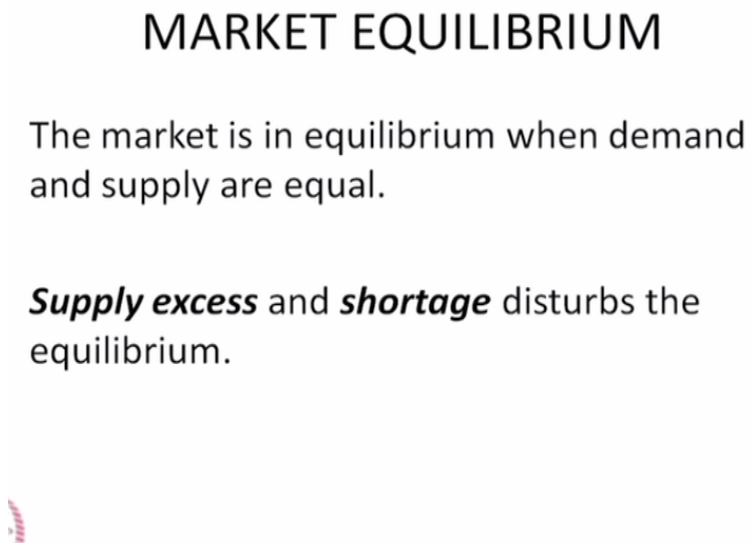

Now what we mean by market equilibrium? The market is in equilibrium when demand and supply are equal. Now if there is an excess supply or if the supply is in shortage of the quantity demanded then it will disturb the equilibrium, but we will see how it is taken care of in competitive conditions.

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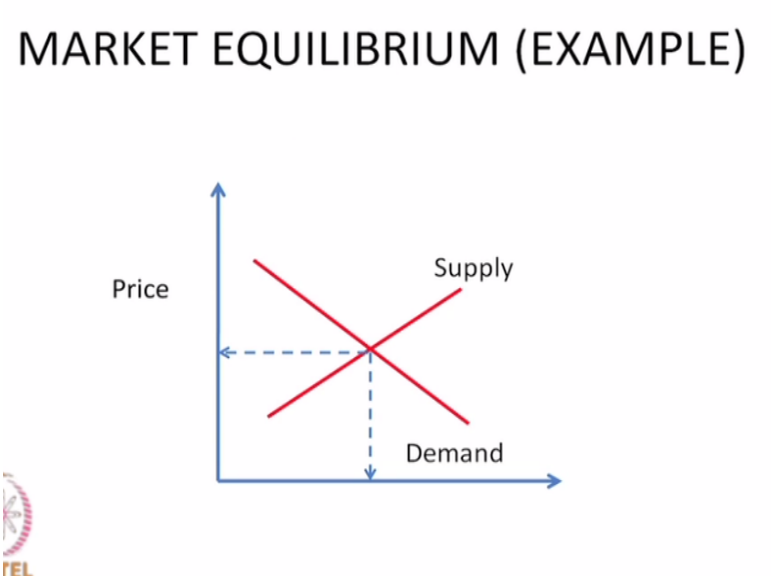

Now here we are showing a case we are superimposing the demand curve and the supply curve. You will see here that as price increases demand falls, but supply rises. Therefore, a case will come where the demand will be = supply. Any change from this point will be registered by the market. For example, this is the equilibrium price and this is the equilibrium demand and supply. If the price goes up, then the demand will fall and there will be excess supply which will reduce the price.

Same thing will happen in this case when there is excess supply. If there is excess supply then price will be more, the demand will come down. Therefore, any change from the equilibrium price and equilibrium demand and supply will be negated by the perfect competition that exists in the market. Now let us take an example and let us show how to derive the equilibrium price and demand values. Let us illustrate whatever we have read with the help of an example.

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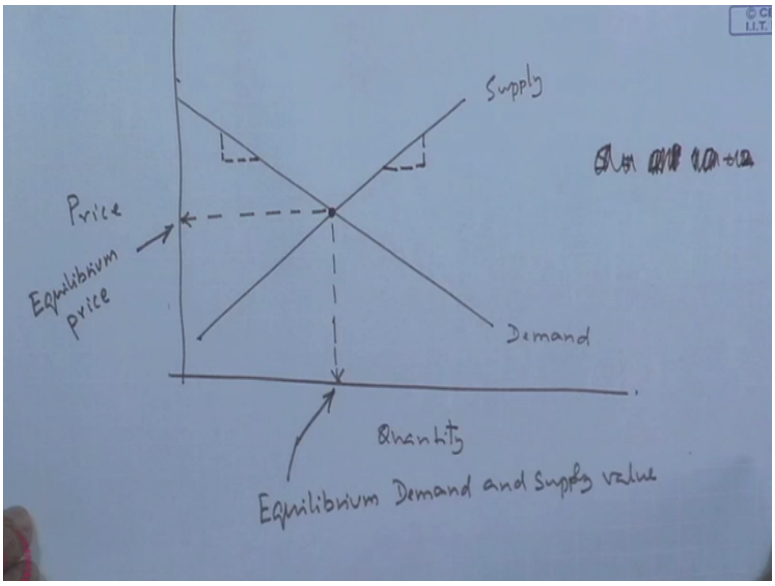

Now this is the price axis and the quantity axis. We have plotted the demand curve which has a negative slope as you can see and this is the supply curve which as a positive slope as you can see we consider this point as an equilibrium point. The corresponding price is the equilibrium price and this is the equilibrium demand and supply value and we say that at this point the demand and the supply are equal.

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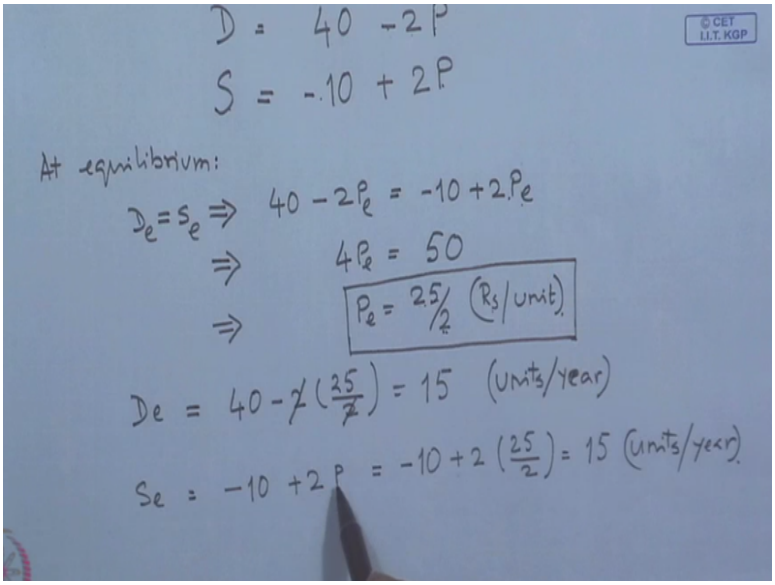

Suppose we assume that the demand this has a negative slope is given by 40 - 2P negative slope as price increases demand falls as prices reduces demand goes up. The supply curve has a positive slope we are assuming S = - 10 + 2P. Now at the equilibrium point demand and supply

are equal and let us call it De and Se at equilibrium point they are equal and therefore 40 - 2P will be = - 10 + 2P and we are writing subscript e to indicate equilibrium price.

Therefore, this comes here 4Pe = that goes there 50 giving a value of Pe = 50/4 which is same by 25/2 rupees per unit. This is the price of the product in the equilibrium condition. The corresponding value of the demand is obtained by substituting P by 25/2 its equilibrium value that comes as 40 -2 * 25/2, so 2 to 2 gets cancelled 40 -25 is 15 units per year and putting the equilibrium value of 25/2 in this expression we get - 10 + 2 * P = - 10 + 2 * 25/2.

And 15 as expected this value is = this value and therefore this value will be 15 units per year and this value will be 25/2 that comes to rupees 12.50 per unit. Now in our next class we shall show how when there is a supply excess or supply scarcity the market is so made that it will negate the changes and brings back the supply to its equilibrium condition rather than continue to operate in an excess or a scarcity situation. Thank you very much.