J.S(P.G) COLLEGE SIKANDRABAD

M.COM 4TH SEMESTER

SUBJECT:MANAGERIAL ECONOMICS

TOPIC: Producer Equilibrium!

Like consumer, a producer also aims to maximise his satisfaction. But a producer's satisfaction is maximised in terms of profit. So, this article deals with determination of a level of output, which yields the maximum profit. In order to clearly understand the concept of producer's equilibrium, it is necessary to understand the meaning of profit.

Meaning of Profit:

Profit refers to the excess of receipts from the sale of goods over the expenditure incurred on producing them.

The amount received from the sale of goods is known as 'revenue' and the expenditure on production of such goods is termed as 'cost'. The difference between revenue and cost is known as 'profit'. For example, if a firm sells goods for Rs. 10 crores after incurring an expenditure of Rs. 7 crores, then profit will be Rs. 3 crores.

Producer's Equilibrium:

Equilibrium refers to a state of rest when no change is required. A firm (producer) is said to be in equilibrium when it has no inclination to expand or to contract its output. This state either reflects maximum profits or minimum losses.

There are two methods for determination of Producer's Equilibrium:

1. Total Revenue and Total Cost Approach (TR-TC Approach)

2. Marginal Revenue and Marginal Cost Approach (MR-MC Approach)

It must be noted that scope of syllabus is restricted to "Producer's Equilibrium by MR- MC Approach". Still, for better understanding, "Producer's Equilibrium by TR-TC approach" is given.

Before we proceed further, we must be clear about one more point. Producer can attain the equilibrium level under two different situations:

(i) When Price remains Constant (It happens under Perfect Competition). In this situation, firm has to accept the same price as determined by the industry. It means, any quantity of a commodity can be sold at that particular price.

(ii) When Price Falls with rise in output (It happens under Imperfect Competition). In this situation, firm follows its own pricing policy. However, it can increase sales only by reducing the price.

For detailed discussion on Perfect and Imperfect Competition, refer Chapter 10. Let us now discuss determination of 'Producer's Equilibrium' by both the methods under the two situations separately.

Total Revenue-Total Cost Approach (TR-TC Approach):

A firm attains the stage of equilibrium when it maximises its profits, i.e. when he maximises the difference between TR and TC. After reaching such a position, there will be no incentive for the producer to increase or decrease the output and the producer will be said to be at equilibrium.

According to TR-TC approach, producer's equilibrium refers to stage of that output level at which the difference between TR and TC is positively maximized and total profits fall as more units of output are produced. So, two essential conditions for producer's equilibrium are:

The difference between TR and TC is positively maximized;

Total profits fall after that level of output.

The first condition is an essential condition. But, it must be supplemented with the second condition. So, both the conditions are necessary to attain the producer's equilibrium.

Producer's Equilibrium (When Price remains Constant):

When price remains same at all output levels (like in case of perfect competition), each producer aims to produce that level of output at which he can earn maximum profits, i.e. when difference between TR and TC is the maximum. Let us understand this with the help of Table, where market price is fixed at Rs. 10 per unit:

Table 1: Producer's Equilibrium (When Price remains Constant):

Output (units)	Price (Rs.)	TR (Rs.)	TC (Rs.)	Profit = TR-TC (Rs.)	Remarks
0	10	0	5	-5	Profit rises
1	10	10	8	2	with increase
2	10	20	15	5	in output
3	10	30	21	9	
4	10	40	31	9	Producer's Equilibrium
5	10	50	42	8	Profit falls with
6	10	60	54	6	increase in output

According to Table 1 , the maximum profit of Rs. 9 can be achieved by producing either 3 units or 4 units. But, the producer will be at equilibrium at 4 units of output because at this level, both the conditions of producer's equilibrium are satisfied:

1. Producer is earning maximum profit of Rs. 9;

2. Total profit falls to Rs. 8 after 4 units of output.

In Fig. 1 , Producer's equilibrium will be determined at P OQ level of output at which the vertical distance between TR and TC curves is the greatest. At this level of output, tangent to TC curve (at point G) is parallel to TR curve and difference between both the curves (represented by distance GH) is maximum.

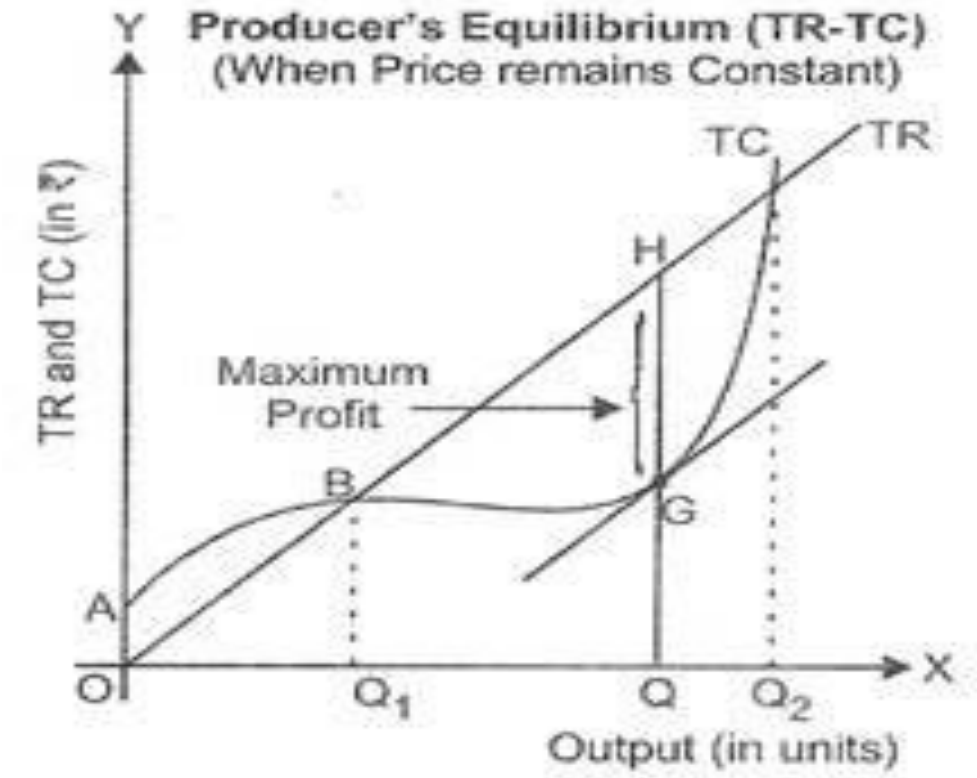

Fig. 8.1

At quantities smaller or larger than OQ, such as OQ_1 or OQ_2 units, the tangent to TC curve would not be parallel to the TR curve. So, the producer is at equilibrium at OQ units of output.

Producer's Equilibrium (When Price Falls with rise in output):

When price falls with rise in output (like in case of imperfect competition), each producer aims to produce that level of output at which he can earn maximum profits, i.e. when difference between TR and TC is the maximum. Let us understand this with the help of Table :

Table 2: Producer's Equilibrium (When Price Falls with rise in output):

Output (units)	Price (Rs.)	TR (Rs.)	TC (Rs.)	Profit = TR-TC (Rs.)	Remarks
0	10	0	2	-2	Profit rises
1	9	9	5	4	with increase
2	8	16	9	7	in output
3	7	21	11	10	
4	6	24	14	10	Producer's Equilibrium
5	5	25	20	5	Profit falls with
6	4	24	27	-3	increase in output

As seen in Table 2 , producer will be at equilibrium at 4 units of output because at this level, both the conditions of producer's equilibrium are satisfied:

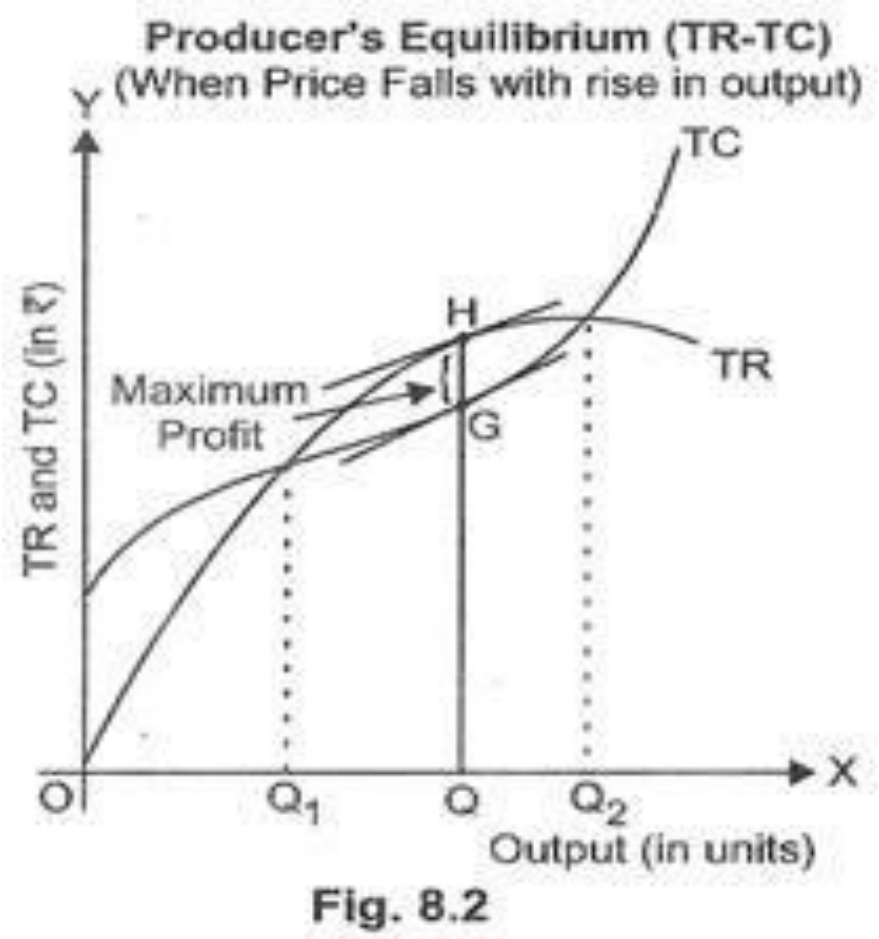

Fig. 8.2

Producer is earning maximum profit of Rs. 10;

Total profits fall to Rs. 5 after 4 units of output.

In Fig. , producer's equilibrium will be determined at OQ level of output at which the vertical distance between TR and TC curves is the greatest. At this level of output, tangent to TR curve (at point H) is parallel to the tangent to TC curve (at point G) and difference between both the curves (represented by distance GH) is maximum.

Marginal Revenue-Marginal Cost Approach (MR-MC Approach):

According to MR-MC approach, producer's equilibrium refers to stage of that output level at which:

1. MC = MR:

As long as MC is less than MR, it is profitable for the producer to go on producing more because it adds to its profits. He stops producing more only when MC becomes equal to MR.

2. MC is greater than MR after MC = MR output level:

When MC is greater than MR after equilibrium, it means producing more will lead to decline in profits.

Both the conditions are needed for Producer's Equilibrium:

1. MC = MR:

We know, MR is the addition to TR from sale of one more unit of output and MC is addition to TC for increasing production by one unit. Every producer aims to maximize the total profits. For this, a firm compares it's MR with its MC. Profits will increase as long as MR exceeds MC and profits will fall if MR is less than MC.

So, equilibrium is not achieved when MC < MR as it is possible to add to profits by producing more. Producer is also not in equilibrium when MC > MR because benefit is less than the cost. It means, the firm will be at equilibrium when MC – MR.

2. MC is greater than MR after MC = MR output level:
MC = MR is a necessary condition, but not sufficient enough to ensure equilibrium. It is because MC = MR may occur at more than one level of output. However, out of these, only that output level is the equilibrium output when MC becomes greater than MR after the equilibrium.

It is because if MC is greater than MR, then producing beyond MC = MR output will reduce profits. On the other hand, if MC is less than MR beyond MC = MR output, it is possible to add to profits by producing more. So, first condition must be supplemented with the second condition to attain the producer's equilibrium.

Producer's Equilibrium (When Price remains Constant):

When price remains constant, firms can sell any quantity of output at the price fixed by the market. Price or AR remains same at all levels of output. Also, the revenue from every additional unit (MR) is equal to AR. It means, AR curve is same as MR curve. Producer aims to produce that level of output at which MC is equal to MR and MC is greater than MR after MC = MR output level.

Let us understand this with the help of Table 3, where market price is fixed at Rs. 12 per unit:

Table 3: Producer's Equilibrium (When Price remains Constant)

Output (units)	Price (Rs.)	TR (Rs.)	TC (Rs.)	MR (Rs.)	MC (Rs.)	Pr = T TC (R
1	12	12	13	12	13	-1
2	12	24	25	12	12	-1
3	12	36	34	12	9	2
4	12	48	42	12	8	6
5	12	60	54	12	12	6
6	12	72	68	12	14	4

According to Table 3 , MC = MR condition is satisfied at both the output levels of 2 units and 5 units. But the second condition, 'MC becomes greater than MR' is satisfied only at 5 units of output. Therefore, Producer's Equilibrium will be achieved at 5 units of output. Let us now discuss determination of equilibrium with the help of a diagram:

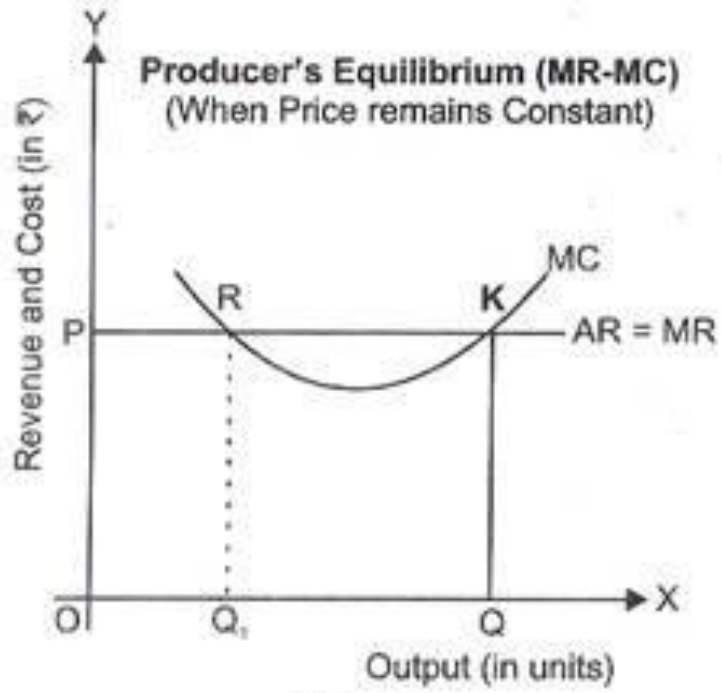

Fig. 8.3

Producer's Equilibrium is determined at OQ level of output corresponding to point K as at this point: (i) MC = MR; and (ii) MC is greater than MR after MC = MR output level. In Fig. , output is shown on the X-axis and revenue and costs on the Y-axis. Both AR and MR curves are straight line parallel to the X-axis. MC curve is U-shaped. Producer's equilibrium will be determined at OQ level of output corresponding to point K because only at point K, the following two conditions are met:

1. MC = MR; and

2. MC is greater than MR after MC = MR output level

Although MC = MR is also satisfied at point R, but it is not the point of equilibrium as it satisfies only the first condition (i.e. MC = MR). So, the producer will be at

equilibrium at point K when both the conditions are satisfied.

Relation between Price and MC at Equilibrium (When Price remains Constant):
When price remains same at all levels of output, then Price (or AR) = MR. As equilibrium is achieved when MC = MR, it means, price is equal to MC at the equilibrium level. For, "Gross Profits are Maximum at Point of Producer's Equilibrium", refer Power Booster Section.

Producer's Equilibrium (When Price Falls with rise in output):
When there is no fixed price and price falls with rise in output, MR curve slope downwards. Producer aims to produce that level of output at which MC is equal to MR and MC curve cuts the MR curve from below. Let us understand this with the help of Table4 :

Table 4: Producer's Equilibrium (When Price Falls with rise in output):

Output (units)	Price (Rs.)	TR (Rs.)	TC (Rs.)	MR (Rs.)	MC (Rs.)	Pr = T TC (R
1	8	8	6	8	6	2
2	7	14	11	6	5	3

3	6	18	15	4	4	3
4	5	20	20	2	. 5	0
5	4	20	26	0	6	-6

According to Table 4 , both the conditions of equilibrium are satisfied at 3 units of output. MC is equal to MR and MC is greater than MR when more output is produced after 3 units of output. So, Producer's Equilibrium will be achieved at 3 units of output. Let us understand the determination of equilibrium with the help of a diagram:

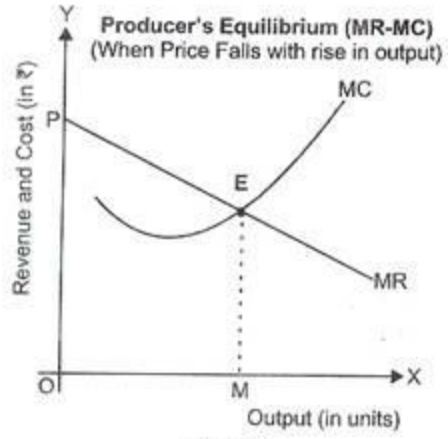

Fig. 8.4

Producer's Equilibrium is determined at OM level of output corresponding to point E as at this point: (i) MC = MR; and (ii) MC is greater than MR after MC = MR output level.

In Fig. 4, output is shown on the X-axis and revenue and costs on the Y-axis. Producer's equilibrium will be

determined at OM level of output corresponding to point E because at this, the following two conditions are met:

1. MC = MR; and

2. MC is greater than MR after MC = MR output level.

So, the producer is at equilibrium at OM units of output.

Relation between Price and MC at Equilibrium (When Price Falls with rise in output):
When more output can be sold only by reducing the prices, then Price (or AR) > MR. As equilibrium is achieved when MC = MR, it means, price is more than MC at the equilibrium level.