



INDIAN SCHOOL MUSCAT
DEPARTMENT OF COMMERCE AND HUMANITIES
SENIOR SECTION
CLASS – XI - MICROECONOMICS (030)
UNIT – 03: PRODUCERS' BEHAVIOR AND SUPPLY
CONCEPTS OF REVENUE



Definition of Revenue

Revenue is the money payment received from the sale of a commodity. The terms mostly used with revenue are: Total Revenue, Average Revenue and Marginal Revenue.

Total Revenue (TR)

TR is defined as the total or aggregates of proceeds to the firm from the sale of a commodity. It is calculated by multiplying price (P) by the quantity sold (Q). For example, if a firm sells 5 chairs at the price of ₹ 100 per chair, the total revenue will be equal to $5 \times 100 = ₹ 500$

Symbolically,

$$TR = PXQ$$

where

P = Price

Q = Quantity sold

Average Revenue (AR)

AR is revenue per unit of output sold. It is obtained by dividing total revenue by the number of units sold. For example, if the TR of a firm from sale of 5 chairs is ₹ 500, then AR will be

equal to $\frac{500}{5} = ₹ 100$.

Symbolically, $AR = \frac{\text{Total Revenue}}{\text{Number of units sold}}$

OR

$$AR = \frac{TR}{Q} \quad \text{Since } TR = P \times Q \quad AR = \frac{P \times Q}{Q}$$

AR = P

Thus, AR is always the same as price.

Marginal Revenue (MR)

MR is addition made to total revenue when one more unit of output is sold.

For example, if a firm earns a total revenue of ₹ 500 by selling 5 chairs and ₹ 520 by selling 6 chairs then the marginal revenue is $₹520 - ₹500 = ₹20$, which is addition to the TR by selling an additional unit (6th chair) of output.

Symbolically,

$$MR = \frac{\text{Change in Total Revenue}}{\text{Change in Quantity Sold}}$$

$$MR = \frac{\Delta TR}{\Delta Q}$$

Where ΔTR = Change in TR and ΔQ = Change in quantity sold.

Marginal Revenue is also $MR_n = TR_n - TR_{n-1}$

That is, MR is the addition to TR of the firm when it sells nth unit of the product instead of n - 1 units.

**Relationship between Revenue Curves under Perfect Competition
(When a firm sells more output at same price)**

In perfect competition, firm is a 'Price-Taker'. There are so many buyers and sellers that no individual buyer or seller can influence the price of the commodity. Any variation in the

output supplied by a single firm will not affect the total output of the industry. To an individual producer the price of the commodity is given. The seller can sell whatever output he produces only at the industry given price. From price and quantity values, TR, AR and MR values can be calculated by using formula as given below.

TR, AR, MR schedules under Perfect Competition (in ₹)

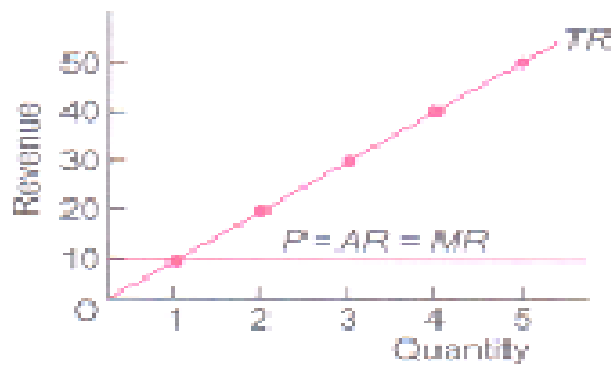
No. of Units Sold (Q)	Price (P)	TR=P X Q	AR=P	$MR = \frac{\Delta TR}{\Delta Q}$
1	10	10	10	10
2	10	20	10	10
3	10	30	10	10
4	10	40	10	10
5	10	50	10	10

The table shows that the values of TR are increasing at the same rate because every additional unit of the commodity is sold at the same price of Rs. 10.

AR values are constant at Rs. 10 at all levels of output. The AR values coincide with the price values, i.e., AR = P.

MR values also remain the same at Rs. 10 because TR increases at the same rate. Thus, MR values coincide with the AR values such that P= AR = MR.

Graphical representation of TR, AR and MR curves under perfect competition



The relationship observed among TR, AR and MR curves is as follows:

1. TR curve is a straight positively sloping line from the origin.
2. TR increases in the same proportion as increase in output sold.
3. AR curve is a horizontal line parallel to the x-axis. It starts from a fixed intercept on the y-axis which is equal to price value (Rs. 10). It coincides with the price line, i.e., AR = P.
4. MR curve is also a horizontal line parallel to the x-axis. Since AR is constant MR is also constant. MR curve coincides with the AR curve such that P=AR=MR.

Relationship between Revenue Curves under Monopoly or Monopolistic Competition (When a firm sells more output by decreasing price)

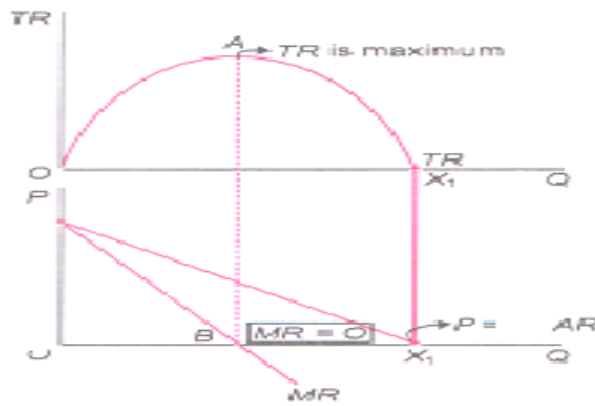
Under imperfect competition (monopoly or monopolistic competition), a firm is able to sell more only by reducing the price of the product. As a result, TR initially increases, then it reaches it, maximum and finally it falls with increase in output. TR curve facing a monopoly firm is inverse U-shaped. For a monopoly firm, AR and MR both decrease with increase in output and MR < AR.

AR and MR curves are both downward sloping and MR curve lies below AR curve.

The TR, AR and MR curves under imperfect competition are shown as:

Revenue Schedules under Monopoly and Monopolistic Competition

Output	AR	TR	MR
1	10	10	10
2	9	18	8
3	8	24	6
4	7	28	4



Very Short Answer Type Questions

1. Define TR, MR and AR
2. Define 'price taker' firm.
3. Draw AR curve under perfect competition.
4. Give the meaning of revenue in micro economics.
5. What is the relationship between total revenue, price and quantity sold?
6. What is the other name of AR?
7. Show that average revenue equals price.
8. What is the shape of total revenue curve under perfect competition?
9. What is the relation between AR and MR in perfect competition?
10. What is the relation between market price and the marginal revenue for a price taking firm?
11. What is the shape of the total revenue curve in monopoly?
12. What is the shape of the average revenue curve in monopoly?
13. What is the shape of the marginal revenue curve in monopoly?
14. What is the relationship between the average revenue curve and the demand curve under perfect competition?
15. Draw AR and MR curves of a firm under monopoly.

Short Answer Type Questions (3/4 Marks)

1. Explain the relationship between total revenue and marginal revenue with the help of a revenue schedule and diagram.
2. Explain the relationship between average revenue and marginal revenue.
3. What is the relationship between marginal revenue and average revenue under perfect competition and monopoly?
4. Why is the total revenue curve facing a competitive firm a straight line passing through the origin?
5. Why is AR always equal to MR for a competitive firm?
6. Explain why the marginal revenue is less than average revenue for a monopoly firm..
7. What changes will take place in marginal revenue when:
 - (a) Total revenue increases at an increasing rate
 - (b) Total revenue increases at a diminishing rate?
8. Define marginal revenue. What happens to average revenue when marginal revenue is
 - (a) Less than average revenue, and
 - (b) Equal to average revenue.
9. What changes in total revenue will result in

- (a) a decrease in marginal revenue and
 (b) An increase in marginal revenue?
10. What will be the effect of the following changes in total revenue on marginal revenue
 (a) Total revenue increases at a decreasing rate.
 (b) Total revenue increases at a constant rate?

Long Answer Type Questions (6 Marks)

1. Explain the relationship between TR , AR and MR with the help of a table with diagram.
2. Prepare a schedule based on imaginary data about TR , AR and MR assuming that the price is same at all levels of output.
3. Prepare an imaginary TR , AR and MR schedule in a market situation in which the firm is able to sell more only by reducing the price of the product.

Numerical Questions

Complete the following table:

Output (Units)	1	2	3	4
TR (Rs.)	4	6	6	4
MR (Rs.)				
AR (Rs.)				

Complete the following table:

Output (Units)	1	2	3	4	5
AR (Rs.)	6	-	4	-	2
MR (Rs.)	-	4	-	0	-
TR (Rs.)	6	-	-	-	10

Complete the following table:

Output (Units)	1	2	3	4	5
AR (Rs.)	10	-	8	-	-
MR (Rs.)	10	8	-	0	-
TR (Rs.)	10	-	-	-	20

Complete the following table:

Output (Units)	1	2	3	4
Price (Rs.)	12	10	8	6
TR (Rs.)	-	-	-	-
MR (Rs.)	-	-	-	-

Complete the following table:

Price (Rs.)	10	9	8	7
Output (Units)	1	2	3	4
TR (Rs.)	-	4	-	-
MR (Rs.)	-	-	-	-

Complete the following table:

Price (Rs.)	5	6	7	8
Output (Units)	8	7	6	5
TR (Rs.)	-	-	-	-
MR (Rs.)	-	-	-	-

Complete the following table:

Output (Units)	1	2	3	4
MR (Rs.)	10	8	6	4
TR (Rs.)	-	-	-	-
AR (Rs.)	-	-	-	-

Complete the following table:

Output (Units)	1	2	3	4
<i>MR</i> (Rs.)	5	5	5	5
<i>TR</i> (Rs.)				
<i>AR</i> (Rs.)				

Complete the following table.

Output (Units)	1	2	3	4
<i>TR</i> (Rs.)	8	14	18	20
<i>AR</i> (Rs.)				
<i>MR</i> (Rs.)				