

Semester spring 2011

Assignment no 02

ECO402

Total Marks: 15

Question no.1:

Suppose you are working in a mobile making firm operating in a perfectly competitive market. Your cost of production is given by:

$$TC = 5000 + Q^2$$

Where Q is the level of output and TC is total cost. The fixed cost of production is Rs.5000.

- If the price of a mobile is Rs.7200, how many mobiles should you produce to maximize profit?
- What will your profit level be?

(Marks = 6 + 6)

Solution 1:

Part a:

As per given data,

$$P = 7200$$

As in a competitive market, price is equal to marginal revenue,

$$P = MR$$

So,

$$MR = 7200$$

Profit is maximized at the point where,

$$MR = MC$$

$$\begin{aligned} MC &= dTC/dQ \\ &= 2Q \end{aligned}$$

Putting the values of marginal revenue and marginal cost, we get,

$$\begin{aligned} 7200 &= 2Q \\ Q &= 7200/2 \\ \mathbf{Q} &= \mathbf{3600} \end{aligned}$$

So at the price of Rs.7200, 3600 watches should be produced to maximize profit.

Part b:

Profit can be calculated by the following formula,

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$$\text{Profit} = \text{TR} - \text{TC}$$

As

$$\text{TR} = P \cdot Q$$

So,

$$\begin{aligned}\text{TR} &= 7200 \cdot 3600 \\ &= 25920000\end{aligned}$$

$$\text{And } C = 80 + Q^2$$

$$\begin{aligned}\text{TC} &= \text{TC} = 5000 + Q^2 \\ &= 5000 + (3600)^2 \\ &= 12965000\end{aligned}$$

So putting the values of total revenue and total cost in the given formula,

$$\begin{aligned}\text{Profit} &= 25920000 - 12965000 \\ &= 12955000\end{aligned}$$

So profit level will be 12955000.

Question no.02:

If a sales tax of Rs.50 per unit of output is placed on one firm whose product sells for Rs.500 in a competitive industry.

What will happen to price, output and profit?

(Marks = 03)

Solution 2:

Because the firm is a price taker, the imposition of tax on only one firm does **not change the market price**. Given that the firm's short run supply curve is its marginal cost curve (above the average variable cost), and that the marginal cost curve has shifted up or inward, the firm supplies less to the market at every price. **So output and profit of the firm will be reduced.**