**Problems and applications from chapter 11(Perfect competition)**

A perfectly competitive firm has the following total costs:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Quantity (Total Product) | Total Cost (*TC*) | Marginal Cost(MC) /  Marginal Revenue(MR) /Price(P)  (3) | **average total cost** (*ATC*)  (4) | **average fixed cost**  **(AFC)** | **average variable cost** (*AVC*)  (6) |
| 0 | $20 | 0 | 0 | 0 | 0 |
| 1 | $34 | 14 | 34 | 20 | 14 |
| 2 | $46 | 12 | 23 | 10 | 13 |
| 3 | $62 | 16 | 20.67 | 6.67 | 14 |
| 4 | $84 | 22 | 21 | 5 | 16 |
| 5 | $112 | 28 | 22.4 | 4 | 18.4 |
| 6 | $146 | 34 | 24.33 | 3.33 | 21 |

1. Calculate this firm’s **marginal cost** (*MC*), **average variable cost** (*AVC*) and **average total cost** (*ATC*) for all appropriate output levels, and show your findings in a table.

Ans: Calculated in column 3,4 and 6. Fixed cost is $20(Since when output =0, the cost is 20) See in 1st row 2nd column. To calculate AVC we first calculate AFC and then subtract AFC from ATC to get AVC.

1. If the market price is $22, what is the firm’s profit-maximizing level of output? (1)

Ans: For a perfectly competitive firm MR=P. So here P=22=MR. Since at profit maximizing point MR=MC so, here P=MC. Thus profit maximization occur at a output level when P=MR=MC=22. Here comparing the table, MC =MR=P=22 occurs when the firm produces 4 units (Compare 5th row of column 1 and 3). So firm’s profit-maximizing level of output is 4.

1. What is the output this firm will need to produce in order to make *normal profits*? (2)

Ans: The firm will produce any output between 4 to 6 that is as long its P> ATC (compare column 3 and 4)

1. Will the firm make a profit if the market price rises to $34? Will it shut-down? Calculate profit/loss.

Ans: The firm will make a positive profit when the market price is 44. Here P>ATC and also P>AVC. The perfect competitive firm shuts down if P<AVC. Here P(44)> AVC(21) so it stays in business.

1. Will the firm make a profit if the market price falls to $12? Will it shut-down? Explain.

Ans: The firm will make a loss when the market price is 12. Here P<ATC and also P<AVC. The perfect competitive firm shuts down if P<AVC. Here P(12)< AVC(13) so it shuts down.

1. Will the firm make a profit if the market price is $14? Will it shut-down? Explain.

Ans: The firm will be indifferent between producing or shuting down since P=AVC=14.

1. At what level of output will the firm decide to close down their operations?

Ans: The firm will decide to close down if P<ATC that occus for any output between 0 to 3.( compare column 3 and 4)