Unit 6. Firm behaviour and market structure: perfect competition

Quiz

1. Which of the following is true for a perfectly competitive firm in the long run?

A. *P=MR=MC=ATC*

B. *P=MR=MC>ATC*

C. *P>MR=MC=ATC*

D. *P=MR>MC=ATC*

E. *P>MR=MC>ATC*

The answer is A.

$$MR = p(Q)\left(1 + \frac{dp(Q)}{dQ} \cdot \frac{Q}{p(Q)}\right) = p\left(1 + \frac{1}{\frac{dQ(p)}{dp} \cdot \frac{p}{Q(p)}}\right) = p\left(1 + \frac{1}{E_p^d}\right) = MC$$

is the general profit-maximizing rule for any type of market structure. A perfectly competitive firm is a price-taker. It cannot affect market price altering its output: $\frac{dp(Q)}{dQ} = 0$. It implies that the first order condition of profit maximization is simplified in this case: $p = MC$. Free entry of new firms into the industry in the long run yields zero economic profits. It implies that in the long run price equals minimum of ATC under perfect competititon.

2. Jason cleans swimming pools in a perfectly competitive local market. A profit-maximizer, he can charge $10 per pool to clean 9 pools per day, incurring total variable costs of $81 and total fixed costs of $19.Which of the following is true?

A. Jason should shut down in the short run, with economic losses of $19.

B. Jason should shut down in the short run, with economic losses of $10.

C. Jason should clean 9 pools per day, with economic losses of $19.

D. Jason should clean 9 pools per day, with economic losses of $10.

E. Jason should clean 9 pools per day, with economic profits of $10.

The answer is D. If Jason cleans 9 pools his total revenue will be $90 and total cost $100, so the loss is $10. Average variable cost of cleaning 9 pools per day is $9. The price is higher than AVC, so Jason should go on cleaning pools with economic losses of $10.

3. For the perfectly competitive firm, the profit-maximizing decision to shut down is made when the price

A. falls below minimum average total cost.
B. is greater than minimum average variable cost, but lower than minimum average total cost.
C. falls below minimum average variable cost.
D. is equal to minimum average total cost.
E. is equal to average fixed cost.

The answer is C. If the price is below average total cost the objective of the firm is to minimize losses. Use the following expression of profit $PR = Q(P - AC) = Q(P - AVC - AFC) = TR - VC - FC$ to clarify the profit-maximizing (loss-minimizing) decision of the firm.

If the firm shuts down its loss equals fixed cost. If the market price is below minimum of AVC, the difference $(P - AVC)$ is negative. Thus, if the firm goes on producing the product, its loss will exceed FC. In this case to minimize losses the firm has to shut down production.

4. The short run supply curve of a perfect competitor is

A. the upward bending segment of marginal cost curve
B. the upward bending segment of marginal cost curve that is higher than minimum of average variable cost
C. the upward bending segment of marginal cost curve that is higher than minimum of average cost
D. the downward sloping segment of marginal cost curve
E. answers B and C are true

The answer is B. The profit-maximizing rule for a perfect competitor is $p = MC$, so marginal cost curve is the foundation for a supply curve. The second order condition of maximum of profits is $MC' \geqslant 0$, so the firm takes into consideration only the upward bending or at least horizontal segment of MC curve. But the firm will continue to produce only if the market price is higher than the minimum of AVC curve. Thus only the portion of the upward bending segment of MC curve that is bounded from below by AVC curve can be considered as the short-run supply curve of a competitive firm.

5. The long-run supply curve of a perfect competitor is

A. the upward bending segment of marginal cost curve

B. the upward bending segment of marginal cost curve that is higher than minimum of average variable cost

C. the upward bending segment of marginal cost curve that is higher than minimum of average cost

D. the downward sloping segment of marginal cost curve

E. answers A and C are true

The answer is C.

The profit-maximizing rule for a perfect competitor is $p = MC$, so marginal cost curve is the foundation for a supply curve. The second order condition of maximum of profits is $MC' \geqslant 0$, so the firm takes into consideration only the upward bending or at least horizontal segment of LMC curve. Free entry of firms to the market and free exit of firms from the market dictate zero economic profit of a firm in the long run. A positive economic profit is an incentive for new firms to enter the market. It lanches the process that pushes the market price down to minimum of LAC curve of a representative firm. If a firm is incurring losses it always has an opportunity to leave the business without any costs in the long run and thus to earn zero economic profit. Thus only the portion of the upward bending segment of LMC curve that is bounded from below by LAC curve can be considered as the long-run supply curve of a competitive firm.

6. Producer surplus of a perfect competitor in the short run is equal to

A. economic profit;

B. economic profit and fixed cost;

C. total revenue minus variable cost;

D. answers B and C are correct;

E. none of the above

The answer is D. In the short run producer surplus represents two main internal sources of capital formation in the firm: profit (PR) and compensation of depreciation that can be represented by fixed cost (FC), i.e.

$$PS = PR + FC.$$

Use definition of profit to show that producer surplus can be calculated as the difference between total revenue and variable cost:

$$PS = PR + FC = TR - VC - FC + FC = TR - VC.$$

7. Production under perfect competition is efficient because

A. Firms produce at prices that are equal to marginal costs

B. Firms produce at prices equal to minimum of long run average costs

C. Firms produce at prices equal to minimum of average variable costs

D. All of the above

E. None of the above

The answer is B.

Production is efficient if the scale effect is utilised to the full extent. LAC curve is usually U-shaped, so initially it is downward sloping, and there are increasing returns to scale. Production efficiency cannot be further improved if output corresponds to LAC minimum. Under perfect competition output of a representative firm in the long run satisfies the condition: $P = LMC = LAC_{min}$, that yields efficiency in production.

8. Suppose that the price at a perfectly competitive market remains unchanged when the firms enter (or exit from) the market. It means that

A. production technology does not exhibit decreasing returns to scale

B. this is a constant-cost industry

C. the long-run market supply curve is horizontal

D. the answers B and C are both correct

E. all the answers above are correct

The answer is D. Entrance of new firms to the market does not affect the prices of factors of production, so LAC curve, as well as the market price that corresponds to its minimum remain unchanged.

9. Suppose that initially an increasing-cost industry is in long-run equilibrium. Assume an increase in demand for the product of the industry that yields a new short-run equilibrium. Adjustment to new long-run equilibrium will:

A. raise equilibrium price and quantity produced

B. reduce equilibrium price and quantity produced

C. raise equilibrium price and reduce equilibrium quantity produced

D. reduce equilibrium price and raise equilibrium quantity produced

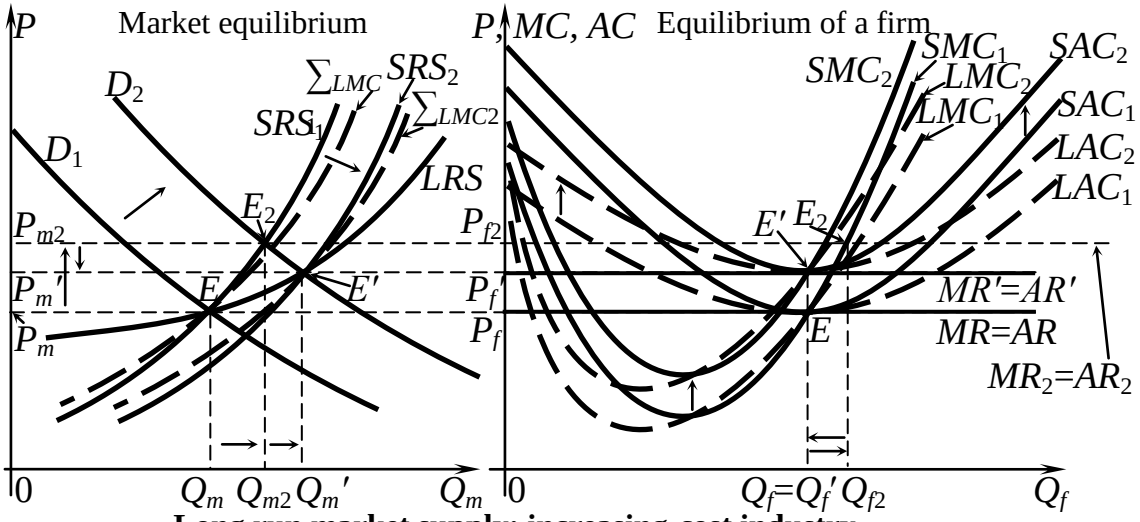
E. information is insufficient to draw a conclusion about the direction of change in equilibrium price and quantity.

The answer is D.

As a result of the upward shift of the demand curve equilibrium price goes up (P_{m2}) and a representative firm in the market makes positive

economic profits in the short run, that attracts new firms to the industry. As the industry adjusts to a new long-run equilibrium the number of firms in the industry is increasing.

Entrance of new firms shifts down short-run supply curve. In the long run equilibrium moves from E_2 to E'. The new long-run equilibrium price P_f' will be lower than its former short-run equilibrium level P_{f2} but higher than the initial price P_f because in an increasing cost industry the rising factors' prices shift upward the firm's average total cost curve (its minimum is now above the former one), and the entrance of new firms to the market will continue until the market price falls down to the new *LAC* minimum (see the figure below). The quantity of the good sold and bought in the market will go up.



Long run market supply: increasing-cost industry

10. Demand curve for a perfectly competitive firm is

A. downward sloping and equal to the market demand curve.

B. perfectly elastic.

C. perfectly inelastic.

D. "kinked" at the going market price.

E. the same as the firms' marginal cost curves.

The answer is B. A firm is a price-taker, it cannot affect market price by its own actions, and demand curve for its product is a horizontal straight line.