Perfect competition is one type of market structure. Firms that operate in this type of structure are known as perfectly competitive firms or perfect competitors. There are five conditions that must be satisfied for perfect competition.

1. There must be many small buyers. This means that no buyer in a perfectly competitive industry has the power to influence the market price.
2. There must be many small sellers. This means that no seller in perfectly competitive industry has the power to influence the market price.
3. The product in perfect competition must be homogeneous. Products from one producer must be indistinguishable to products from other producers.
4. The buyers and sellers have access to all relevant information necessary to make rational decisions.
5. There is no barrier to entry or exit. Firms that wish to enter or exit a perfectly competitive industry must be able to do so freely.

A perfectly competitive firm is a price taker as no firm in perfect competition has the power to influence the market price. If no firm is able to influence the market price, how is the market price determined? The market price is determined by the product’s overall demand and supply, known as the market demand and market supply.

There are two different demand curves to consider. Each perfectly competitive firm in an industry faces its own demand curve, known as either the firm’s demand or the demand faced by the firm. Of course, market demand is the demand faced by all of the firms serving the industry together. The equilibrium point, where market demand meets market supply, shows us the equilibrium quantity and the equilibrium price. What this means is that while no individual firm in perfect competition may be able to
influence the market price, the collective group of firms in the industry, through its
decision about total quantity to produce in the market, determines the market price.

\[ MR = MC \]

How does each firm decide how much output to produce and what price to charge? The
profit-maximizing quantity is determined by the equation above. Each firm always
decides how much output to produce by equating marginal revenue and marginal cost.
Marginal revenue is the amount of additional revenue a firm earns by selling one
additional unit of output. Marginal cost is the amount of additional cost a firm incurs by
selling one additional unit of output.

Suppose that it costs a coffee shop $1.00 to make the first cup of coffee, $1.50 to make
the second cup of coffee, and $2.00 to make the third cup of coffee. The marginal cost
for the first cup of coffee is $1.00, for the second cup $1.50 and for the third cup $2.00.
Suppose also that the coffee shop is a perfectly competitive firm and is a price taker. If
the price indicated by the market is $1.50 for a cup of coffee, $1.50 is the marginal
revenue for every cup. Profit can be earned for every cup that brings in more money for
that cup than what it costs to produce that cup. When an additional cup brings in just
enough money to cover the cost of that cup, we should stop producing more because
our profit is maximized at that point.

\[ P = MR \]

The equation above expresses that market price is marginal revenue. This is the case in
perfect competition. As a price taker, no single firm is able to influence the market price.
The first cup of coffee brings in $2.00 just as the one thousandth cup brings in $2.00.
The market price is the marginal revenue for every unit in perfect competition.

\[ MR = MC \]

\[ P = MR \]

\[ P = MC \]

Marginal revenue and marginal cost must be the same for profit-maximization. In perfect
competition, market price is marginal revenue. These two ideas can be mathematically
combined. The resulting idea is that the market price and the marginal cost must be the
same for profit-maximization. This holds in perfect competition.
The four diagrams show marginal cost, average variable cost and average cost curves. They also show the profit-maximizing quantity where the marginal revenue and the marginal cost are equal. Common to all four diagrams is the fact that when the marginal cost curve intersects the average cost curve, the average cost is minimized. This is because the average cost will increase if the marginal cost is above the average cost.

Suppose that we have equally weighted exams, scores of which count towards our final grade. On the first exam, we score 90%. This is our marginal score for the first exam. The average score is still 90%. On the second exam, we score 94%. This is our marginal score for the second exam. The average score is now 92%. If we receive a score that is higher than the previous average score of 92%, the new average score will be higher. If we receive a score that is equal to the previous average score of 92%, the new average score will be the same. If we receive a score that is lower than the previous average score of 92%, the new average score will be lower. If the subsequent exam scores are higher than the average score, the average score will increase.

The market prices in the four diagrams are different. In the upper left diagram, the market price is located above the average variable cost but at the same level as the average cost, making no economic profit or loss. In the upper right diagram, the market price is located above the average variable cost but below the average cost, making an
economic loss. In the lower left diagram, the market price is at the same level as the average variable cost, making an even greater economic loss because the market price is higher in the upper right diagram. In the lower right diagram, the market price is below even average variable cost. As soon as the market price is below average variable cost, we must shut down. This is because every unit sold is adding to our economic loss, never mind covering the fixed cost. In contrast, when the market price is below the average cost but above the average variable cost, every unit sold contributes to covering the fixed cost.

So far, we examined diagrams where the market price is below or at the same level as the variable cost. In the short run, where firms cannot freely choose between production technologies, perfectly competitive firms may be able to enjoy economic profits. This occurs when the market price is above the variable cost.

In the diagrams above, the market price is higher than the average cost. For each unit, the revenue per unit exceeding the average cost per unit is the profit per unit. The profit per unit is the length of the profit box. The quantity sold is the width of the profit box. When the length and the width are multiplied, the product becomes the profit area. This profit area represents total economic profit to the firm.
This possibility of economic profit only exists in the short run for perfectly competitive firms. In the long run, the profit area disappears for perfectly competitive firms. When there is the possibility of economic profit, it attracts entrepreneurs who can freely enter the market because there is no barrier to entry or exit in perfect competition. As more and more firms join, the market price is driven down to the lowest point of the average cost curve where there is no economic profit.

Recall that productive efficiency is achieved if the economy produces on the production possibilities frontier (PPF). If the production combinations are employing (1) full and (2) efficient use of available resources, they are on the PPF and are productively efficient. In other words, when output is produced at the minimum of average cost, productive efficiency is achieved. In the long run, perfectly competitive firms produce at the minimum of average cost and thus satisfy productive efficiency.

Allocative efficiency is achieved if the economy produces the productively efficient production combination that the economy most desires. How do we know which productively efficient production combination is most desired by the economy? Price speaks to the value placed on goods and services by consumers. Marginal cost speaks to the social cost of producing goods and services. If the value placed on a particular good by consumers is higher than the social cost of producing that good ($P > MC$), the quantity produced is not enough for allocative efficiency. The benefit to consumers outweighs the cost to producers. If the value placed on a particular good by consumers is lower than the social cost of producing that good ($P < MC$), the quantity produced is too much for allocative efficiency. The cost to producers outweighs the benefit to consumers. Only when the value placed on a good or service by consumers is equal to the social cost of producing that good or service ($P = MC$), is allocative efficiency achieved. In perfect competition, the market price is equal to the marginal cost. Therefore, perfect competition achieves allocative efficiency.
Practice Problems

1. Which of the following most closely resemble perfect competitors?
   a) Retail gasoline stores
   b) Patented drug manufacturers
   c) Automobile manufacturers
   d) Phone makers

2. What is the difference between the demand faced by a perfectly competitive firm and the market demand?
   a) There is no difference.
   b) The demand faced by a perfectly competitive firm is perfectly elastic and the market demand is less than perfectly elastic.
   c) The demand faced by a perfectly competitive firm is perfectly vertical and the market demand is perfectly horizontal.
   d) The slope of the demand faced by a perfectly competitive firm is more negative than the slope of the market demand.

3. Which of the following is a profit-maximizing condition for firms in general?
   a) \( P = MR \)
   b) \( MR = MC \)
   c) \( P = AC \)
   d) \( MR = AC \)

4. Which of the following is a profit-maximizing condition specifically for perfectly competitive firms?
   a) \( P = AC \)
   b) \( D = S \)
   c) \( P = MP \)
   d) \( P = MC \)

5. Which of the following is a condition for productive efficiency?
   a) \( P = AC \)
   b) \( D = S \)
   c) \( P = MR \)
   d) \( P = MC \)

6. Which of the following is a condition for allocative efficiency?
   a) \( P = AC \)
   b) \( D = S \)
   c) \( P = MR \)
   d) \( P = MC \)
7. Does perfect competition lead to productive efficiency?
   a) Yes.
   b) No.
   c) Only in the short run.
   d) Depends on the weather.

8. Does perfect competition lead to allocative efficiency?
   a) Yes.
   b) No.
   c) Only in the short run.
   d) Depends on the weather.

9. When $P > MC$ for a good, what does it mean for the quantity exchanged of that good in the economy?
   a) The economy did not produce enough of the good.
   b) The economy produced too much of the good.
   c) It may rain tomorrow.
   d) It may be sunny tomorrow.

10. When $P < MC$ for a good, what does it mean for the quantity exchanged of that good in the economy?
   a) The economy did not produce enough of the good.
   b) The economy produced too much of the good.
   c) It may rain tomorrow.
   d) It may be sunny tomorrow.

**Answers**

1. A
2. B
3. B
4. D
5. A
6. D
7. A
8. A
9. A
10. B