Question 1

12 points (4 + 4 + 4)

(a) 4 points:
• One point is earned for a correctly labeled graph of the apple market, with \( P_M \) and \( Q_M \) properly indicated.
• One point is earned for showing that the firm’s price equals the market price.
• One point is earned for the tangency of flat firm demand (\( P_F \)) and ATC.
• One point is earned for \( Q_F \) where MR (P) = MC.

(b) 4 points:
• One point is earned for concluding that the lump-sum subsidy will have no impact on Callahan’s output.
• One point is earned for explaining that the lump-sum subsidy will not affect MC (or MR).
• One point is earned for concluding that Callahan’s profit will increase.
• One point is earned for concluding that the number of firms in the industry will not change.

(c) 4 points:
• One point is earned for concluding that the number of firms in the industry will increase.
• One point is earned for explaining that the existence of profits attracts new firms.
• One point is earned for concluding that the price will fall.
• One point is earned for concluding that industry output will increase.
(a) Apple Market  

![Graph showing supply and demand curves for apple market.]

Callahan's Orchard  

![Graph showing marginal costs and profit maximization.]

(i) The market output and price occur where supply intersects with demand.

(ii) Callahan's expected price occurs at the market price because it is in a perfectly competitive market and is a price taker. Its quantity occurs where its marginal revenue, equal to price, equals its marginal cost.

(b)(i) Callahan's quantity of output would not change. Because the subsidy was given in a lump sum, it does not shift the marginal cost curve. Therefore, the intersection & profit maximizing output where marginal cost equals marginal revenue occurs at the same point.

(iii) In the short run, Callahan will make an economic profit. The subsidy will shift the Average Total Cost (ATC) curve down. The price will then exceed ATC at Q_f, output quantity. This is shown in the following graph.
(iii) Because in the short-run there are fixed costs and firms cannot enter/exit an industry but only use existing plants more/less intensively, no new firms will enter and the number of firms in the industry in the short run will remain the same.

(c) (i) In the long run, firms will enter the industry drawn in by the economic profits being made.

(ii) When new firms enter, market supply increases, as shown in the graph below, from $s_1$ to $s_2$. This causes the market price, $p_m$, to decrease to $p_2$. Because firms are price takers, their prices will fall 2; they will only make a normal profit in the long run.

(iii) Industry output increases, from $q_m$ to $q_2$ in the above graph.
b) (i) With an annual subsidy to apple growers, farmers in this industry would have decreased resource costs. This equates to a decrease in marginal cost and so Callahan's MC (marginal cost) curve shifts to the right with a subsidy. So Callahan's quantity of output increases from $Q_F$ to $Q_H$.

(ii) Profits come from $Price \times Quantity$ and because of an increase in quantity for Callahan's firm, Callahan's profit will increase.

(iii) On the market side with less resource costs, the short run is a time too short for firms to change to another industry and so the number of firms remains constant.
(i) Firms see that there are less resource costs in the industry for apple farmers with the subsidy and because resource costs are a determinant of supply, supply increases with an increased number of firms in the industry.

With an increase in supply price, the industry is back to equilibrium. The price decreases and demand as a result rises from D to D. At this point, the market equilibrium price, \( P_m \), is at the market and the price has returned to equilibrium in the end.

(ii) With the increase in supply and demand, quantity of apples have increased from \( Q_m \) to \( Q_e \) and so industry output has increased.
Now, that the government granted a lump-sum subsidy to all apple growers, there is a chance that Callahan's output and profit will increase or decrease. If Callahan is known for his apples and consumers really like his produce, then his output will increase. If his output increases, then his profit will also increase. More consumers will purchase his apples now that he has a greater advantage. However, if consumers weren't too pleased with his apples or other apple growers were given a chance to step into this market, they may try someone new. In this case, Callahan's output and price will decrease. There will not be as many customers as before. Since the government granted a subsidy to all apple growers, firms may enter into this market now, meaning more competition. In the long-run, firms who aren't making enough profit because consumers aren't purchasing from
firms may not enter in the short-run because they would have to exit in the long-run. When exiting in the long-run, they might face an economic loss. If more firms exit the industry, price will increase because there will not be as much competition & other firms can charge more in order to make a profit. Depending on how many firms are left & how much more apples are demanded, the industry output can increase or decrease.
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2008 SCORING COMMENTARY

Question 1

Overview

The question asked students to draw diagrams of a perfectly competitive firm and a market in long-run equilibrium and to determine the effect of a lump-sum subsidy in the short run and in the long run.

Sample: 1A
Score: 12

All parts are correctly answered.

Sample: 1B
Score: 7

The student lost a point in part (a)(i) for failing to show that the market price is equal to the firm’s price. In part (b)(i) the student lost the first point for incorrectly asserting that the lump-sum subsidy causes output to increase in the short run and the second point for an incorrect explanation. The student lost a point in part (c)(i) for failing to explain that profits cause the increase in the number of firms and a point in part (c)(ii) for incorrectly asserting that price does not change in the long run.

Sample: 1C
Score: 2

In part (a)(i) the student earned the first point for a correctly labeled graph of the apple market and the second point for indicating that the firm’s price is equal to the market price.