The questions below are from material in Chapters 9, 13 and 14.

1. The world price of cotton is below the no-trade price in Great Britain and above the no-trade price in Peru. Using supply and demand diagrams and welfare tables such as those in Chapter 9, show the gains from trade in each country. Compare your results for the two countries.

   Great Britain:
   
<table>
<thead>
<tr>
<th></th>
<th>Before Trade</th>
<th>After Trade</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer Surplus</td>
<td>A</td>
<td>A+B+C</td>
<td>+(B+C)</td>
</tr>
<tr>
<td>Producer Surplus</td>
<td>B+D</td>
<td>D</td>
<td>-B</td>
</tr>
<tr>
<td>Total Surplus</td>
<td>A+B+D</td>
<td>A+B+C+D</td>
<td>+C</td>
</tr>
</tbody>
</table>

   Peru:

<table>
<thead>
<tr>
<th></th>
<th>Before Trade</th>
<th>After Trade</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer Surplus</td>
<td>E+F</td>
<td>E</td>
<td>-F</td>
</tr>
<tr>
<td>Producer Surplus</td>
<td>B</td>
<td>F+G+H</td>
<td>F+G</td>
</tr>
<tr>
<td>Total Surplus</td>
<td>E+F+H</td>
<td>E+F+G+H</td>
<td>+G</td>
</tr>
</tbody>
</table>

   Both countries have a net gain from trade.

2. Consider the domestic market for cell phones, with the domestic price above the world price. From your diagram, is the U.S. a net exporter or importer of cell phones? Now suppose that Congress imposes a tariff on cell phones. Show the effect of the tariff on the following: the quantity of imports, the quantity of domestically produced cell phones, the price of cell phones in the U.S., government revenue, and the deadweight loss. What does the deadweight loss represent?
Price in US rises by the amount of the tariff. World price does not (why?).

Before tariff: $\text{Cell phone imports} = Q_{d1} - Q_{s1}$
\hspace{1cm} Domestic output $= Q_{s1}$

After tariff: $\text{Cell phone imports} = Q_{d2} - Q_{s2}$ (smaller than before)
\hspace{1cm} Domestic output $= Q_{s2}$ (bigger than before)

Tax revenue is area E.

Deadweight loss from tariff is D+F. This is a loss of gains from trade (in this case, all CS) that would have occurred in absence of the tariff, but doesn’t occur because of the tariff. In terms of resource allocation, too many resources in the US are devoted to cell phone production; without the tariff, these resources would be employed in the production of a higher-valued output.

3. Suppose that winemakers in the state of Indiana petitioned the state government to tax wines imported from other states. They argue that this tax would both raise tax revenue for the state government and raise employment in the Indiana State wine industry. Do you agree with these claims. By the standard of economic efficiency, is it a good policy? The tax on wine from other states is just like a tariff imposed by one country on imports from another. As a result, Indiana wine producers would be better off and Indiana wine consumers would be worse off. The higher price of wine in Indiana
would lead to increased production of wine in Indiana, so more Indiana resources (including labor) would be used to produce wine; employment in the Indiana wine industry would rise. In addition, tax revenue would flow to Indiana government. So both claims are true. But the increased in resources devoted to wine represent a decrease in resources devoted to the production of other goods. So there is not an increase in overall Indiana employment. In addition, such a tax would be bad policy in terms of economic efficiency, because the losses to Indiana consumers would exceed the gains to producers.

4. Suppose you operate a business with the yearly costs shown below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries</td>
<td>$30,000</td>
</tr>
<tr>
<td>Materials</td>
<td>15,000</td>
</tr>
<tr>
<td>Electricity</td>
<td>2,000</td>
</tr>
<tr>
<td>Phone</td>
<td>2,000</td>
</tr>
<tr>
<td>Rent</td>
<td>12,000</td>
</tr>
</tbody>
</table>

You should recognize that all these are explicit costs, totaling 61,000.

You use your own car instead of renting a similar one for $4000 a year, and you turned down an offer to earn a $20,000 salary working for someone else. Your total revenue is $80,000.

You should recognize these two items are implicit costs totaling 24,000.

a. What is your accounting profit? $80k-61k=19k
b. What is your economic profit? $80k-(61k+24k)= -5k

5. You go out to eat at the best restaurant in town and order a lobster dinner for $40. After eating half the lobster, you realize that you are quite full. Your date wants you to finish your dinner because you can’t take it home and “you’ve already paid for it.” What should you do? What would it cost you to leave half the dinner uneaten?

Once you have ordered the dinner, you are obligated to pay for it. You can’t change the price you pay by eating more or less of your dinner. Therefore, the cost of the dinner should not influence your decision about stuffing yourself. Given the facts in this problem, it costs you nothing to leave half the dinner uneaten.

6. Perfectly competitive firms are called “price takers.” What does this mean? Why do they behave this way?
P.C. firms take the market price as given because they have no control over price.

7. What are the characteristics of a perfectly competitive industry? Which of the following drinks do you think is best described by these characteristics? Why aren’t the others?

a. tap water
b. bottled water
Characteristics:
Large number of buyers and sellers, each small relative to the market
Homogeneous product
Free entry and exit

Of these goods, bottled water is probably the closest to a competitive market (although my taste buds think they detect qualitative differences across brands, and I personally have a strong preference for Dasani). Tap water is a natural monopoly because there's only one seller (more about this topic in Chap 15). Cola and beer are not perfectly competitive because every brand is slightly different.

8. What is the rule for profit maximization? Explain why this rule maximizes profits.
*Produce output where MR is greater than or equal to MC (and P > AVC). This rule gives the largest value of (TR-TC).*

9. Draw the cost curves for a typical firm in a competitive market. For a given price, explain how the firm chooses the level of output that maximizes profit.
*The graph below shows the cost curves for a typical firm. For a given price (such as $P^*$), the level of output that maximizes profit is the output where marginal cost equals price ($Q^*$), as long as price is greater than average variable cost at that point (in the short run), or greater than average total cost (in the long run).*

10. Under what conditions will a firm shut down temporarily? Explain.
*A firm will shut down temporarily if the revenue it would get from producing is less than the variable costs of production. This occurs if price is less than average variable cost. By shutting down the firm minimizes its losses.*

11. Under what conditions will a firm exit a market? Explain.
*A firm will exit a market if the revenue it would get if it stayed in business is less than its total cost. This occurs if price is less than average total cost. A decision to exit is by definition a long-run decision, so the exit decision is implicitly based on a projection of permanent losses.*
12. Does a firm’s price equal marginal cost in the short run, in the long run, or both? Explain.

A firm's price equals marginal cost in both the short run and the long run. In both the short run and the long run, price equals marginal revenue. The firm should increase output as long as marginal revenue exceeds marginal cost, and reduce output if marginal revenue is less than marginal cost. Profits are maximized when marginal revenue equals marginal cost.

13. Does a firm’s price equal the minimum of average total cost in the short run, long run, or both? Explain.

The firm's price equals the minimum of average total cost only in the long run. In the short run, price may be greater than average total cost, in which case the firm is making profits, or price may be less than average total cost, in which case the firm is making losses. But the situation is different in the long run. If firms are making profits, other firms will enter the industry, which will lower the price of the good. If firms are making losses, they will exit the industry, which will raise the price of the good. Entry or exit continues until firms are making neither profits nor losses. At that point, price equals average total cost.

14. Fill in the table below:

<table>
<thead>
<tr>
<th>P ($)</th>
<th>Q</th>
<th>TR ($)</th>
<th>MR ($)</th>
<th>TC ($)</th>
<th>MC ($)</th>
<th>Profit ($)</th>
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</thead>
<tbody>
<tr>
<td>9</td>
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<td>0</td>
<td>10</td>
<td>-10</td>
<td></td>
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<td>54</td>
<td>9</td>
<td>70</td>
<td>21</td>
<td>-16</td>
</tr>
</tbody>
</table>

a. Given the information above, what is the maximum possible profit for this firm? At what level of output does the maximum profit occur? Explain the two methods of determining this level of output.

Max profit = $3. Q=3. In terms of totals: TR-TC at max. In terms of marginals: MR ≥ MC.

b. Graph the demand curve, the marginal revenue curve and the marginal cost curve for this firm.
c. Assume that there are 100 identical firms in this industry. Draw a graph of the industry supply and demand curves that correspond to the graph in part (b).

For each firm, S curve is MC curve above AVC. Sum these to get industry supply.

d. Suppose price increases to $11. How many units will the firm produce? What will its profits be?

Firm will now produce 4 units and profits will be $10. TR=$44, TC=$34.

15. State the long run equilibrium condition for a perfectly competitive industry and for a typical firm within that industry. Show this industry and firm on a graph. In what sense does long run competition promote efficiency?

Qd=Qs at Pe for the industry and P=ATC for the firm. Given that there are zero economic profits, there is no tendency for entry or exit of resources from this industry.

In the long run, resources are attracted to industries that are most profitable, which means resources are allocated to highest-valued uses. In the competition for profits, firms have an incentive to reduce production costs as much as possible, which provides an incentive to conserve scarce resources.


GM apparently believed these losses were temporary (they were), so GM lost less by operating than by shutting down.

Your graph should show the firm producing a quantity (q*) where MR=MC. At this quantity, the firm is sustaining losses, since price is less than ATC. But the firm is covering the costs of operating, since price is greater than AVC.
Note that we are using the model for a perfectly competitive firm, even though the auto industry is probably not perfectly competitive.

17. Assume that the gold-mining industry is competitive.

a. Illustrate the long-run equilibrium using diagrams for the gold market and for a representative gold mine.

b. Suppose that an increase in demand for jewelry induces a surge in the demand for gold. Using your diagrams from part (a), show what happens in the short run to the gold market and to the typical gold mine.

c. If the demand for gold persists over time at the level in part (b), what would happen in the market for gold over a long period of time? The profits earned by the typical firm would signal entry of resources into the industry. Existing firms would grow and new firms would enter, causing
the supply curve to shift to the right. As this happens, the price is bid down toward the level where $P=ATC$ for the typical firm, which would restore the LR equilibrium.