PROBLEM SET 4

This problem set is worth 250 points. The point-value of each question is stated in parentheses after the question.

1. Consider a perfectly competitive market for good X.
   a. List and discuss the important structural characteristics of a perfectly competitive market. (10 points)
   b. Employ a demand/supply model of the market for good X to explain why all firms in this market will earn zero economic profit in the long run. Explain why firms are willing to stay in this market in the long run even though they earn zero economic profit in the long run. (15 points)
   c. Explain how positive consumption externalities keep a perfectly competitive market from reaching a socially optimal outcome. Illustrate with a demand/supply model of the market for good X. Identify and evaluate one welfare enhancing policy response to this “market failure.” (15 points)
   d. The model of perfect competition is often criticized on the grounds that there are few, if any, perfectly competitive markets in the real world. In fact, some critics argue that the model of perfect competition is so unrealistic that it is of no value when it comes to understanding market behavior in the real world. How would you counter these criticisms? (15 points)
2. You are the sole beer distributor in Mount Vermin. You sell “pony kegs” only. Your total cost function is given by

\( C(K) = 10K \)

where \( K \) is the number of kegs you sell. Given this simple cost structure, your marginal cost and average total cost are given by

\( MC_K = AC_K = 10. \)

You have sufficient market power to set the price of kegs in Mount Vermin. However, you must charge the same price to each and every one of your customers. The weekly market demand for kegs in Mount Vermin is given by

\( K(P_K) = 1500 - 30P_K \)

where \( P_K \) is the price of a keg.

a. Derive the marginal revenue function that is associated with the demand function defined in equation 3. Illustrate the demand curve and the marginal revenue curve on the same diagram. Put \( K \) on the horizontal axis. Explain IN DETAIL why \( MR(K) < P(K) \) for all \( K > 0 \). (NOTE: Marginal revenue will be a function of \( K \). See p. 275 in Varian for assistance. Be careful. Varian is working with an inverse demand function. The demand function in equation 3 is a direct demand function.) (15 points)

b. How many kegs will you sell each week? What price will you charge? How much profit will you earn each week? Illustrate these results with an accurately drawn, completely labeled diagram. (10 points)

c. Use marginal analysis to explain IN DETAIL why you will sell neither more nor less than the number of kegs you determined in part b. Illustrate your analysis with a “new” diagram. (15 points)

For the last few months a student from the local college has been working as an intern in your firm. (Somehow, she convinced a gullible professor at the local college to sponsor an internship at a beer distributor.) She has conducted extensive analysis of the market for beer in Mount Vermin and has determined that three different groups of people buy beer at your firm: students who are affiliated with fraternities and sororities at the local college (A), unaffiliated students from the local college (U), and townies (T).

The weekly demand for kegs among affiliated students is given by

\( K^A(P_K^A) = 650 - 10P_K^A \)

where \( K^A \) is the number of kegs demanded by affiliated students and \( P_K^A \) is the price paid by affiliated students.
The weekly demand for kegs among unaffiliated students is given by

\[ K^U(P^U) = 310 - 10P^U \]

where \( K^U \) is the number of kegs demanded by unaffiliated students and \( P^U \) is the price paid by unaffiliated students.

The weekly demand for kegs among townies is given by

\[ K^T(P^T) = 540 - 10P^T \]

where \( K^T \) is the number of kegs demanded by townies and \( P^T \) is the price paid by townies.

You want to exploit this situation. You decide to charge one price to affiliated students, another price to unaffiliated students, and yet another price to townies. (NOTE: All affiliated students pay one price \( P^A \). All unaffiliated students pay one price \( P^U \). All townies pay one price \( P^T \). However, affiliated students, unaffiliated students, and townies may pay different prices.)

d. What price will you charge affiliated students for a keg? Unaffiliated students? Townies? How much profit will you make each week when you implement this pricing scheme? (10 points)

e. Identify two conditions you MUST meet in order to establish and maintain these price differentials over time. (10 points)

f. Explain IN DETAIL how and why you benefit from being able to charge different prices to affiliated students, unaffiliated students, and townies. Be sure to discuss the economic intuition underlying your pricing scheme. (NOTE: You MUST employ demand elasticities here. Keep in mind the price you were charging everybody before you decided to charge different prices to each of the three groups of consumers.) (15 points)
3. You represent I.M. ToneDef, who has just finished recording a collection of his latest and greatest tunes. You plan to sell these tunes in CD format to his many fans. You estimate the demand for ToneDef’s new CD will be

\[(1) \quad CD(P_{CD}) = 10000 - 500P_{CD}\]

where CD is the number of CDs demanded and \(P_{CD}\) is the price of a CD.

You are currently negotiating with Rip Uhoff to manufacture and market ToneDef’s new CD. Rip has informed you that he can manufacture and market ToneDef’s new CD subject to the following total cost function

\[(2) \quad C(CD) = 5CD.\]

Given this simple cost structure, Rip’s marginal cost and average total cost to manufacture and market a CD is given by

\[(3) \quad MC_{CD} = AC_{CD} = 5.\]

You have to negotiate a contract with Rip Uhoff. After all, ToneDef wants to be compensated for all his hard work. If you sign a contract with Rip, then he will have the exclusive right to manufacture and market ToneDef’s new CD. However, there are other firms that can manufacture and market ToneDef’s new CD. So, if your negotiations with Rip fail, you can take ToneDef’s tunes to another firm.

Suppose contracts in the recording industry take one of the following forms:

**CONTRACT A:** the recording artist receives a payment \((f)\) for each CD sold

**CONTRACT B:** the recording artist receives a fraction \((0 \leq \varphi \leq 1)\) of the total profit earned from the sale of CDs.

If you choose **CONTRACT A**, then you will have to negotiate \(f\) with Rip. If you choose **CONTRACT B**, then you will have to negotiate \(\varphi\) with Rip.

a. Which contract will you select and what compensation rate will you demand? Justify. By the way, you already have a contract with ToneDef that calls for ToneDef to pay you 10% of the money he receives from any recording contract you negotiate for him. (NOTE: If you select **CONTRACT A**, then you will need to choose a value for \(f\). If you select **CONTRACT B**, then you will need to choose a value for \(\varphi\).) (20 points)

b. How is Rip likely to respond to your contract demands? Explain. (10 points)

c. Now, suppose that after you sign a contract with Rip, the U.S. Supreme Court rules that Napster and other similar internet-based firms do not violate any U.S. laws. Will you want to renegotiate ToneDef’s contract with Rip? Explain. (10 points)
4. Address the following questions and statements within the context of the model of perfect competition and the model of simple monopoly you were introduced to in ECB 102. Include diagrams when they will facilitate your discussion. (10 points each)

a. Consider a firm that is producing 2000 units of output at a total cost of $10,000. The firm sells this output for a total revenue of $12,000. Evaluate the following statement in light of this information. “This firm is earning an average profit of $1 per unit of output. Therefore, this firm can increase its total profit by producing more output.”

b. Explain why it is inappropriate to employ a demand and supply diagram to model the behavior of a profit maximizing monopolist.

c. Larry, Curly, and Moe run the only saloon in town. Larry wants to sell as many drinks as possible without losing money. Curly wants the saloon to bring in as much revenue as possible. Moe wants to make the largest possible profit. Using a single diagram, show the price and quantity combinations favored by each of the three partners.

d. It is a commonly held belief that the major oil companies in the US collude so as to raise the market price of gasoline above the competitive price. However, the elasticity of the demand for gasoline is approximately .7 in the long run. Explain why the estimated elasticity of the demand for gasoline casts serious doubt on the belief that the major oil companies collude in the market for gasoline.

e. In a letter to The Wall Street Journal (Aug. 27, 1990), Senator Ernest Hollings wrote: “Consumers do not benefit from lower-priced imports. Glance through some mail-order catalogs and you’ll see that consumers pay exactly the same price for clothing whether it is U.S.-made or imported.” Comment.

f. Identify and discuss four barriers to entry that might serve to protect monopoly profits.

g. Evaluate the following statement. “This new government regulation will raise the cost of doing business in this industry. However, consumers will not face a higher price as a result of this regulation. This industry is so competitive that no firm will risk losing its customers by raising its price. Instead, firms in this industry will pay for the additional regulation-related costs through a reduction in their profits.”

h. What does it mean to say a monopolist has “market power”? Can a monopolist “charge any price it wants to charge”?