Professor Robin Wells, Spring 1998

Economics 14.03: Midterm Quiz III

Instructions: There are three sections. Sections I and II have a choice of question, while Section III has no choice. Please be concise and to the point in your answers.

Section I

Do any 2 of the 3 following questions: (22 points each)

1. A duopolist industry faces the demand curve

$$Q = 250 - P,$$

and each firm has a constant marginal cost of \$4.

(a) Find the Cournot reaction functions for the two firms. What are the Cournot duopoly equilibrium price and quantity?

(b) What are the Bertrand duopoly equilibrium price and quantity? Assume that the two firms engage in un-cooperative Bertrand behavior.

(c) What will be the Cournot equilibrium in Q and P if the number of firms goes to infinity?

(d) Why has it been argued that Cournot behavior is realistic only when sunk-cost investments are made?

2. Two firms (A and B) are considering bringing out competing brands of a healthy cigarettes. Payoffs to the companies are as shown in the table (A's profits are given first):

		Firm B	
		Produce	Don't Produce
Firm A	Produce	3,3	5,4
	Don't Produce	4,5	2,2

(a) Does this game have a Nash equilibrium in pure strategies? If there is more than one, point out all Nash equilibria. Is it (are they) pareto-efficient?

(b) Does this game present any first-mover advantages for either firm A or firm B?

(c) Would firm B find it in its interest to bribe firm A enough to stay out of the market?

3. Suppose a monopolist has K plants which have costs given by

$$C_k(q_k) = c + \theta_k q_k^2$$

where $\theta_k > 0$ for any $k \in [1, 2, ..., K]$. Each plant produces an identical product, so $\sum_{k=1}^{K} q_k = Q$.

(a) Show how the monopolist optimally allocates production across his K plants.

(b) How would your answer change if the costs are given by: $C_k(q_k) = c + \theta_k q_k$?

Section II

Do any 3 of the 4 following statements: (10 points each). Indicate whether the following statements are True or False, and briefly explain your answer.

1. Suppose a monopolist has declining MC, and charges one price in market A. Suppose a new market called B is made available to the monopolist (e.g., B lies in another country and trade has just opened up between the countries). Assume that for any amount sold by the monopolist in market A and market B, labelled Q_A and Q_B respectively, that $|e_B| > |e_A|$. Also assume that the monopolist can discriminate between the two markets. Then customers in market A are made worse off by the opening of market B.

2. A non-regulated monopolist will never produce a Pareto-efficient level of output.

3. In industries with few firms, the FTC forbids the practice in which companies publish a price list where prices are constant for a long period of time (say 1 year). This policy is generally welfare-enhancing.

4. Nash behaviour assumes that players can write contracts (or promises to each other) that can always be enforced (say by a court of law).

Section III

Answer the following questions briefly and concisely. (26 points total.)

There has been much public and political controversy over the high prices of pharmaceutical drugs that are covered by proprietarial patents. These patents allow the drug company that discovers the drug to obtain large profits from the sale of much-needed drugs. Typically, the costs of developing a new drug are very high while the costs of actually manufacturing the drug are quite low. There are have been two methods discussed to make patented drugs more accessible to the public. One approach is to regulate entry, allowing a rival drug firm to produce a similar compound once the new drug has been discovered by the incumbent firm (where the costs of engineering a pharmacologically similar compound are small compared to the costs of discovering the original new drug). Another approach is to regulate pricing, where the incumbent firm is allowed to be a monopolist but the government allows the firm to charge different prices to different customers (and the government may even subsidize the drug costs of some customers).

(1) What is the general problem facing the regulator? That is, what problem must he solve?

(2) What information would have to be known by whom in order to achieve a pareto-efficient allocation of the drug in the case of regulated entry? In the case of regulated pricing?

(3) Which policy do you think is superior? On what grounds?

(4) Would your answer to (3) change if there were substantial costs to engineering a similar compound? (Examine the case in which future industry profits

are high enough to compensate for this cost, and the case in which they are not high enough to compensate).