EC3322
Industrial Organization I
Semester 2, 2010-2011
Midterm
March 2, 2011

Instructions

1. Do NOT start reading the questions until you are told to do so.
2. There are a total of 3 pages, including this front page. Make sure you have all 3 pages before beginning.
3. This exam consists of SIX (6) questions. Answer ALL SIX questions. The exam totals 100 points.
4. Write your answers in the answer booklets provided.
5. Write your matriculation number and your tutorial group number (or time and day) on the answer booklets provided RIGHT NOW. Do not write your name on the answer booklets. If you do not write your matriculation number and tutorial number, you will be penalized 5 points.
6. You MAY NOT use calculators. If you have a calculator on your desk, you will receive a 10 point penalty.

Answer ALL questions. You must include your work in order to receive full marks.

1. (5 points) Consider the following types of price discrimination. What type of price discrimination, first-degree, second-degree, or third-degree, does each represent? (No explanation is necessary for this question.)

   (a) If you buy one pair of Levi jeans, you can buy a second pair at half price.

   (b) Senior citizens pay \$0.50 for a cup of coffee at McDonald's, but everyone else pays \$1.

   (c) Five tickets to the World Cup are auctioned to the highest bidders. The tickets sell for \$12,000, \$11,990, \$11,980, \$11,975, and \$11,970.

2. (10 points) Suppose an oligopoly consists of three identical firms. Industry demand is $P = 100 - 2Q$ and $MC = 20$. What is the Cournot Nash equilibrium? What is the price?

3. (20 points) The demand curve for a certain good is $P = 100 - Q$. The marginal cost for a monopolist is $MC(Q) = Q$, for $Q \leq 30$. The marginal cost is infinite for $Q > 30$. That is, the maximum that can be supplied in this market is $Q = 30$.

   (a) What price will the profit-maximizing monopolist set?

   (b) What is the deadweight loss due to monopoly in this market?

   (c) Draw a graph of the monopolist's problem indicating the optimal price and output.

4. (20 points) Consider the following game depicting competition in the market for high-definition television (HDTV). The United States and Japan must decide simultaneously whether to invest a high or a low amount on HDTV research. Each country's payoffs are summarized below:

		Japan: Low	Japan: High
U.S.	Low	4,3	2,4
	High	3,2	1,1

   (a) What is the Nash equilibrium (or Nash equilibria) of this game?

Now suppose that the United States has the option of committing to a strategy before Japan's decision is reached.

(b) Draw the game tree of this new game, and derive the normal form (matrix) representation.

(c) What is the Nash equilibrium (or Nash equilibria) of this game?

(d) What is the Subgame Perfect Nash Equilibrium? What is the outcome of the game?

5. (20 points) Consider a monopolist facing two consumers. Consumer 1 has demand curve $P_1 = 200 - 4Q_1$, and consumer 2 has demand curve $P_2 = 122 - 6Q_2$. Assume fixed costs are zero and $MC = 8$. The monopolist cannot tell whether a consumer is consumer 1 or consumer 2.

(a) The monopolist decides to use a single, two-part tariff such that both consumers purchase the product. Assume it prices at marginal cost. Solve for the fixed fee and each consumer's quantity. What is the monopolist's profit?

(b) Can the monopolist do better? Continue to assume that a single, two-part tariff is used and that the firm prices at marginal cost.

6. (25 points) A monopolist produces a product whose demand and production costs vary with quality z and quantity q according to:

$$\begin{aligned} P(z,q) &= z(1-q) \\ C(z,q) &= z^2 q \end{aligned}$$

Note that $z \geq 0$ in this problem.

(a) Calculate the price and quality levels that a monopolist would choose and the corresponding quantity sold.

(b) Find consumer surplus and profits.

(c) Derive the socially optimal quality for the quantity choice q^* found in part (a).