ECN 453: Mid-term Exam 1: Practice

Instructions:

- You have **70 minutes**
- You may bring a calculator and notes on a two-sided cheat-sheet on letter-size paper.
- Please be neat. If your work is too messy it will not be graded.
- Be sure to show your working.
- This is a long exam, so there are lots of ways to get points. If you get stuck, move on!
- Good luck!

Name: _____

Question:	1	2	3	4	Total
Points:	30	30	30	30	120
Score:					

1. Short Answer Questions (30 points)

1. Depending on the question, write either:

   - a number
   - one of: True, False, or NEI (Not Enough Information)
   - a definition (i.e. one or a few words)

   (a) (3 points) A monopolist faces a constant elasticity demand curve with elasticity -2 and has a constant marginal cost = 5. What is the optimal price?

   (a) _____

   (b) (3 points) Name one policy solution to monopoly power.

   (b) _____

   (c) (3 points) Name a second policy solution to monopoly power (different from your above answer).

   (c) _____

   (d) (3 points) True, False, or Not Enough Information: given two markets, a monopolist will always charge a higher *price* in a market with more inelastic demand.

   (d) _____

   (e) (3 points) True, False, or Not Enough Information: there is a unique Nash equilibrium in every simultaneous game.

   (e) _____

   (f) (3 points) True, False, or Not Enough Information: there is no dead-weight-loss under perfect price discrimination.

   (f) _____

   (g) (3 points) Suppose that a monopolist has the cost $C(q) = 10 + 5q^2$ and the perfect competition price and quantity is at $p_{pc} = 10, q_{pc} = 1$. What subsidy will the regulator need to provide the monopolist to ensure it does not shutdown under *marginal cost pricing*?

   (g) _____

   (h) (3 points) True, False, or Not Enough Information: consumers are always worse-off under price discrimination.

   (h) _____

   (i) (3 points) True, False, or Not Enough Information: if there is a dominant strategy in a simultaneous game with two strategies and two players, then there is also a dominated strategy.

   (i) _____

   (j) (3 points) True, False, or Not Enough Information: suppose that there are two strategies A and B in a simultaneous game, and two players. If player 1 has a best response to B of A, then player 2 has a best response of B to A as well.

   (j) _____

2. Price discrimination by indicators (30 points)

2. Suppose you are the owner of a movie theater. Assume that the marginal cost of a seat is \$20. There are two types of customers: students (denoted 's') and non-students (denoted 'ns'). You know if a customer is a student or non-student and so you could potentially use price discrimination with *selection by indicators*. The demand for movie seats for each of these segments is:

$$\text{Student: } q_s = 50 - p_s$$
$$\text{Non-student: } q_{ns} = 100 - p_{ns}$$

1. Assume that you cannot distinguish between students and non-students, and so you can only set a single *uniform price* for all consumers.

(a) (4 points) What is the total demand for movie seats under uniform pricing?

(b) (4 points) What is the marginal revenue for movie seats under uniform pricing?

(c) (8 points) What is the optimal uniform price? (Hint: plot marginal revenue.)

(d) (2 points) What is the consumer surplus under uniform pricing?

2. Assume that you can distinguish between students and non-students, and so you can do *price discrimination by indicators*.

(a) (4 points) What are the optimal prices for students and non-students?

(b) (2 points) What is the consumer surplus?

3. Suppose that there are only (identical) students in the market, and that the interpretation of the demand curve for students is now *how many* tickets each student demands.

(a) (6 points) What is the optimal two-part-tariff for students?

3. Pricing airline tickets (30 points)

3. Suppose you are the CEO of an airline and there are two segments of airline ticket consumers: business and tourists. Marginal cost = \$30 per seat.

There are two types of tickets: standard and restricted, where a restricted ticket has limitations about when/where it can be used (and so we can think of it as a 'damaged' good). The number of consumers and willingness-to-pay for each consumer is given in the following table:

Consumer type	**Number of consumers**	**Willingness to pay (\$)**	
		Standard	Restricted
Business	10	180	80
Tourist	30	60	50

1. Assume that you can distinguish between business and tourist consumers.

(a) (5 points) What is the profit under perfect price discrimination?

2. Assume that you cannot distinguish between business and tourist consumers.

(a) (5 points) If you can only offer the standard ticket, what is the optimal uniform price?

(b) (5 points) Suppose that you charge \$180 for the standard ticket and \$50 for the restricted ticket. What is the airline's profit?

(c) (5 points) Suppose that you charge \$90 for the restricted ticket. What is the optimal price for the standard ticket?

(d) (10 points) Suppose that you charge \$50 for the restricted ticket. What is the optimal price for the standard ticket?

4. Game theory (30 points)

4. Consider the following game (where 'x' stands for a number).

		Player 2: L	Player 2: R
Player 1	T	50 0	50 - x 0
	B	20 10	-20 -20

(a) (5 points) Assume that $x = 0$. What are all the Nash equilibria?

(b) (5 points) Provide a value of x where (B,L) is the *unique* Nash equilibrium?

(c) (10 points) Assume that $x = 0$ and that the players play (B,L) in the simultaneous game. How much would player 2 pay to commit to moving first? (Hint: it might be helpful to write out the sequential game.)

(d) (10 points) Assume that player 2 moves first. Provide a value of x to ensure that (B, L) is the unique subgame-perfect equilibrium.