

SAMPLE MIDTERM EXAMINATION
(This exam was given on Thursday, October 18, 2001.)

Directions: This is a closed-book exam. Please print your name clearly on each answer book.

Answer all questions as clearly and legibly as possible. The exam has a total of 300 points; the number of points and a suggested amount of time is indicated for each question. You must turn in this exam along with your answer books before leaving the room.

Students in the 8:30 a.m. section:

I will not discuss the contents of this exam with anyone in other sections before 1:00 p.m.

Students in the 10:30 a.m. and 11:30 a.m. sections:

I have not discussed the contents of this exam with anyone who took it earlier this morning.

Signed: _____

Print your name: _____

1. (80 points; 24 minutes) Decide whether each of the following statements is **True**, **False**, or **Uncertain**, and give a **brief but clear explanation** of your answer. (Most of the credit will be given for the explanation.)

- 1a) (*NOTE: 1a) not covered any more*) The market demand for diamond glazed skillets in quarter t is described by

$$\ln Q_t = 3.60 - .643 \ln(P_t) - .231 \ln(PC_t) + 1.12 \ln(I_{t-1}) + .646 \ln(Q_{t-1}) + e_t,$$

where P is price in dollars (of a standard size skillet), PC is an index of other cookware prices, I is the average income of the wealthiest households (top 10% of the wealth distribution) and the “ $t-1$ ” subscript denotes the previous quarter.

The demand for diamond glazed skillets is price inelastic.

(*Note: you do not need to calculate logarithms to answer this question.*)

- 1b) A start-up U.S. biotech manufacturer purchases 30 heavy processing machines, and may buy more as output increases. These machines are made only in Germany, but are widely used in the biotech industry. They have an average life of 10 years, and there is an active resale market. Two years after this purchase, the U.S. imposes a 50% tariff on all imported equipment of this kind. All else equal, the tariff will cause the biotech firm’s variable costs to rise.
- 1c) Your company lost a court case and has to pay \$20 for every snowmobile it produces. The verdict cannot be overturned. That implies that this is a sunk cost and should not play a role in further decision making.
- 1d) If you suspect the market for your new product could exhibit positive network externalities, it makes sense for you to price your product lower at launch than you normally would. .

2. (80 points; 20 minutes) Suppose that market for loaves of bread in Freedonia has demand $D(p) = 20,000 - 1,000 p$ and supply $S(p) = 1,000 p$, where p is price per loaf..

- (a) What are the price and total quantity of bread supplied? What are the demand price elasticity and supply price elasticity at this price?
- (b) The government of Freedonia imposes a price band : the price of bread cannot be lower than \$1.00 nor higher than \$2.00. What are the new price and total quantity supplied? What is the deadweight loss? How much do producers gain or lose because of the price band? How about consumers?
- (c) Due to the introduction of a new technology, the supply curve shifts and becomes $S(p) = 9,000 p$. What are the new price and total quantity supplied? What is the deadweight loss now? How much do producers gain or lose because of the price band now? How about consumers?
- (d) Give a dollar amount of the value to Freedonia of the new technology described in part (c), relative to the situation of part (a), absent any government intervention.

3. (100 points; 24 minutes) The rock band Pink Floyd is coming to Boston to perform at Foxboro Stadium once again (the last time Pink Floyd was in Boston was in the summer of 1994), and you are in charge of pricing and selling the tickets (assume all seats are the same and you only need to set a single price). Independent of the number of seats sold, you must pay the administration of Foxboro Stadium a fixed amount of \$ 500,000 (to cover security and cleaning costs), which represents the only cost. There are 50,000 seats in Foxboro Stadium.

- (a) (30 points) Based on historical data, you estimate the demand for this event to be given as

$$Q_d = 80 - .8 P$$

Where Q_d is in thousands of tickets and P is the price per ticket in dollars. What price P should you charge? How many tickets will you sell and what are your profits? (Don't worry if there are empty seats, you can always give those seats away to worthy charities.)

- (b) (30 points) One month prior to the concert, Pink Floyd's newest album is released, with rave reviews about how the band is much better than they have ever been before. Because of this, you now believe that demand will be given as

$$Q_d = 120 - .8 P$$

Where again Q_d is in thousands of tickets and P is the price per ticket in dollars. What price P should you charge? How many tickets will you sell and what are your profits? (Again, don't worry if there are empty seats, you can always give those seats away to worthy charities.)

- (c) (30 points) Suppose with demand as in b), you have the option of adding some temporary seats on the grass field for \$10 a seat (assume these seats have the same view as the other seats and tickets for them would sell for the same price). Would you add any seats? If so, what price would you charge, how many tickets would you sell and what would your profits be?
- (d) (10 points) How would your answer to (c) change if extra seats cost \$30 (state in words, including your reason -- do not do any more algebra)?

4. (40 points; 12 minutes) Discuss the following quote: "In any urban area, there is a single market for local phone calls, regardless of whether they are made using a cellular phone or a local (conventional) telephone phone." Be sure to include your criteria for market definition. Also, indicate whether your view would depend on whether cellular phone calls have similar prices to those of local (conventional) calls, or not.