Industrial Organization
ECNS 406
Fall 2011

Exam #: 2

Tuesday November 8, 2011

Name: ____________________________________________________________

Instructions:
You must answer exactly 4 of the following 5 questions. Each question is worth the same amount. You have the class period to complete the exam.
Answer each question clearly and concisely. You must show your work to receive credit. This exam is given under the rules of the Montana State University. You may not use notes or receive any assistance. There is to be no talking during the exam.
Clearly print your name above and in the space provided on the next page. You must turn in both sides of this cover sheet along with your responses. You do not need to turn in the questions, only your responses with the cover sheet.
Name: ________________________________

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1. For the following questions, refer to the first part of the attached article, “In Retreat, Bank of America Cancels Debit Card Fee” by Bernard in the 11/1/2011 edition of the New York Times.

(a) Describe a simplistic version of the game that Bank of America is trying to play. Your description should explicitly list all the elements of your game.

(b) Describe the dynamic features of your game and describe why they are important.

(c) Give two economic reasons why the nation’s 2nd largest bank might have trouble establishing an equilibrium with debit card fees.

(d) Assuming that an equilibrium with debit card fees is established, what are two factors that are important for maintaining this equilibrium?

2. A durable goods monopolist faces an inverse demand function of $P = 20 - Q$ and has a constant marginal cost of production equal to 4. The monopolist can choose two prices before the good becomes obsolete: a price today ($P_1$) and a price tomorrow ($P_2$). Tomorrow’s profits are discounted at an interest rate of 25%.

(a) What is the quantity demanded in the second period taking into consideration the consumers who purchased the durable product in the first period?

(b) Find the firm’s period 2 price expressed as a best response to their first period price.

(c) Setup the firm’s first period profit maximization problem.

(d) What are the equilibrium prices in each period?

3. Two firms, firm A and firm B, compete in prices and both firms have the same constant marginal cost. When both firms collude, they do so in an optimal fashion and the profits of each firm is $\pi$. In each period, Firm B only chooses between two strategies: the price that results from optimal collusion and the price that results from a non-cooperative equilibrium with no collusion. Firm B’s dynamic strategy is to play a type of tit-for-tat. With this strategy, Firm B plays the price associated with optimal collusion only when Firm A plays this price in the previous period. If Firm A played any other price in the previous period, then Firm B plays the price that results from a non-cooperative equilibrium with no collusion. The interest rate is $r$.

(a) If Firm A makes a profitable deviation from a collusive equilibrium, what is the price and profits associated with an optimal deviation?

(b) What are Firm A’s profits one period after Firm A makes a profitable deviation?

(c) What are the discounted sum of profits associated with a collusive equilibrium?

(d) If both firms are in a collusive equilibrium and Firm A makes an optimal deviation in one period but then plays the collusive strategy from then on out, what are the discounted sum of profits for Firm A associated with the one time deviation?

(e) In this case, what should the interest rate be so that a collusive equilibrium is maintained? Why?
4. Consider a linear city Hotelling model. There are at most two firms, A and B, located at the ends of the product space. The length of the product space is 5 and transportation costs are 1 times the distance traveled. Each consumer has a baseline valuation of 10 and each firm has a constant marginal cost of 2.

(a) If Firm A is a monopolist and located to the very left of the product space, characterize the indifferent consumer.

(b) If Firm A is a monopolist and located to the very left of the product space, what is the equilibrium price, quantity and profit?

(c) If Firm B enters the market and is located to the very right of the product space, what is the new competitive equilibrium price?

(d) Compare the monopoly outcome to the duopoly outcome.

5. Consider a Salop circular model of product differentiation with equally spaced firms. The circumference of the circle is 10. Each consumer has transportation costs of 1 times the distance traveled and a baseline valuation of 100. Firms have constant marginal costs of 5. There are $N$ firms. Answer the following question for a competitive equilibrium assuming that it exists.

(a) Express a firm’s demand as a function of the neighboring firm’s prices and the number of firms. What will a firm’s demand be in equilibrium?

(b) Setup a firm’s profit maximization problem and determine a firm’s best response as a function of the number of firms and neighboring firm’s prices.

(c) What is the equilibrium price as a function of the number of firms?

(d) Determine the following comparative static: $\frac{\partial \pi}{\partial N}$. 