ECN 453: Final Exam (Practice)

Instructions:

- You have **110 minutes**

- Please write your final answer in the underlined section provided.

- You may bring a calculator and notes on two, two-sided cheat-sheets, 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	5	6	Total
Points:	45	30	30	30	30	30	195
Score:							

Short Answer Questions (45 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) What 'problem' can occur in vertical relationships if one firm needs to make a relationship-specific investment, but the other firm cannot commit to pay them until after the investment has been made?

   (a) ——————

   (b) (3 points) What is one *benefit* (that we discussed in class) from vertical integration?

   (b) ——————

   (c) (3 points) Suppose there is an upstream manufacturer M selling an input to two downstream retailers R_1 and R_2 (and these downstream retailers are competing against each other). If the manufacturer merges with R_1, would you expect the wholesale price between M and R_1 to increase or decrease, compared to vertical separation?

   (c) ——————

   (d) (3 points) Consider again the merger in the previous question. Would you expect the wholesale price between M and R_2 to increase or decrease, compared to vertical separation?

   (d) ——————

   (e) (3 points) True, False, or Not Enough Information: If price cuts are difficult to observe, then occasional price wars may be necessary to discipline collusive agreements.

   (e) ——————

   (f) (3 points) True, False, or Not Enough Information: As the number of firms in a market increases it *typically* makes it *harder* for firms to form a collusive agreement.

   (f) ——————

   (g) (3 points) Suppose there are three firms in a market with market shares 0.5, 0.25, and, 0.25, respectively. Compute the Herfindahl-Hirschman Index.

   (g) ——————

   (h) (3 points) What is the value of the Lerner index in a monopoly market?

   (h) ——————

   (i) (3 points) What is the value of the Herfindahl–Hirschman Index under perfect competition?

   (i) ——————

   (j) (3 points) Consider an identical n-firm Cournot market with market size $S = 1$, total demand $p = 10 - Q$ (where Q is the total market quantity), and the total cost for each firm is $C(q) = 1 + q$. Assuming that firms continue to enter so long as profit is not negative, how many firms will enter the market in equilibrium?

   (j) ——————

(k) (3 points) Give the reason (discussed in class) why the beer market in the US has approximately the same number of firms as the beer market in Portugal, despite being 30x-50x its size.

(k) ———————

(l) (3 points) What is the value of the 'four-firm concentration index' if there are three firms in a market?

(l) ———————

(m) (3 points) True, False, or Not Enough Information: If barriers to entry are not very high, then mergers tend to be followed by new firm entry.

(m) ———————

(n) (3 points) True, False, or Not Enough Information: Provide one concern (that we discussed in class) that a regulator might have when deciding whether to approve a merger.

(n) ———————

(o) (3 points) True, False, or Not Enough Information: Provide one benefit (that we discussed in class) that a regulator might consider when deciding whether to approve a merger.

(o) ———————

Movie Theater Question (30 points)

2. Suppose you are the owner of a movie theater. There are two types of customers: students (denoted 's') and non-students (denoted 'ns'). The demand for movie seats for each of these segments is:

$$\text{Student: } q_s = 75 - 2p_s$$
$$\text{Non-student: } q_{ns} = 80 - p_{ns}$$

(a) (30 points) Assume that you cannot distinguish between students and non-students, and so you can only set a single *uniform price* for all consumers. Assume that the marginal cost of a seat is $15. What is the optimal uniform price?

Stackelberg Competition (30 points)

3. There are two firms in a market with total demand $p = 100 - 2Q$. Firm 1 moves first and Firm 2 moves second. Firm 1's total cost is $C(q_1) = 1 + 2q_1^2$. Firm 2's total cost is $C(q_2) = 0$.

(a) (30 points) Suppose that the firms compete in a Stackelberg equilibrium. What is the equilibrium quantity for <u>Firm 1</u>?

Hotelling Model (30 points)

4. Suppose 100 consumers are uniformly distributed on a 1 mile stretch of road. There are two supermarkets on the road: Supermarket 1 is located at the west end of the road (at location $= 0$), and Supermarket 2 is part way along the road (at location $= 0.3$). Transport costs for consumers are <u>$1.0 per mile</u>. The supermarkets' marginal costs are 0. The supermarkets compete on prices: denote Supermarket 1's price p_1 and Supermarket 2's price p_2.

(a) (20 points) What is the demand for each supermarket?[1]

(b) (10 points) If Firm 2 chooses a price $p_2 = 0.2$, what is Firm 1's best response p_1?

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[1]When computing consumer choices, only consider the transport costs to get to the supermarket, don't worry about the return journey.

Collusion (30 points)

5. Consider the following game and suppose that it is repeated an infinite number of times. Players have a discount value of δ.

<div align="center">

Player 2

	L	R
T	8 8	9 0
B	0 9	1 1

Player 1

</div>

(a) (30 points) For what values of δ can collusion on (T,L) be sustained under the following grim trigger strategy:

- Play (T,L) if (T,L) has been played in all previous periods
- Otherwise play (B,R).

Vertical Relationships (30 points)

6. Suppose that there are two firms in a supply chain: a manufacturer who sells to a retailer. The timing is as follows:

1. Manufacturer has a constant marginal cost $c = 1$ and sets input price w to maximize profit.

2. Retailer buys input from manufacturer for price w. Retailer sets price p to maximize profit with demand $D(p) = 8 - p$.

(a) (20 points) What are the joint profits of the firms (i.e. the sum of the profit of the manufacturer and the retailer) under vertical separation?

(b) (10 points) Explain in one to two sentences why the joint profits will be higher under vertical integration than under vertical separation.