ECON 180 - Regulation & Antitrust Policy
Drake University, Spring 2015
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Signature: _____

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TEST 6 VERSION B
"Theories of Market Structure"

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators or calculators with alphabetical keyboards are NOT permitted. Mobile phones or other wireless devices are NOT permitted. Points will be subtracted for illegible writing or incorrect rounding. Point values for each question are noted in brackets.

I. Problems: Insert your answer to each question below in the box provided. Feel free to use the margins for scratch work—only the answers in the boxes will be graded. Work carefully—partial credit is not normally given for questions in this section.

(1) [Measuring industry concentration: 27 pts] Suppose two industries each consist of six firms with the following market shares.

Industry A		Industry B	
Firm #1	30%	Firm #1	40%
Firm #2	20%	Firm #2	15%
Firm #3	20%	Firm #3	15%
Firm #4	20%	Firm #4	10%
Firm #5	5%	Firm #5	10%
Firm #6	5%	Firm #6	10%

a. Suppose Industry A is a Cournot oligopoly. Which firm must have higher marginal cost—Firm #1 or Firm #6?

b. Compute Industry A's four-firm concentration ratio (4CR).

c. Compute Industry B's four-firm concentration ratio (4CR).

d. Which industry is more concentrated according to the 4CR?

e. Compute Industry A's Hirschman-Herfindahl index of concentration (HHI).

f. Compute Industry B's Hirschman-Herfindahl index of concentration (HHI).

g. Which industry is more concentrated according to the HHI?

h. Assume Industry A is a Cournot oligopoly and that the industry's elasticity of demand is -2. Compute its average Lerner index (or "price-cost margin"). [Hint: Recall the formula: avg L = HHI / (10,000 $|\varepsilon|$) .]

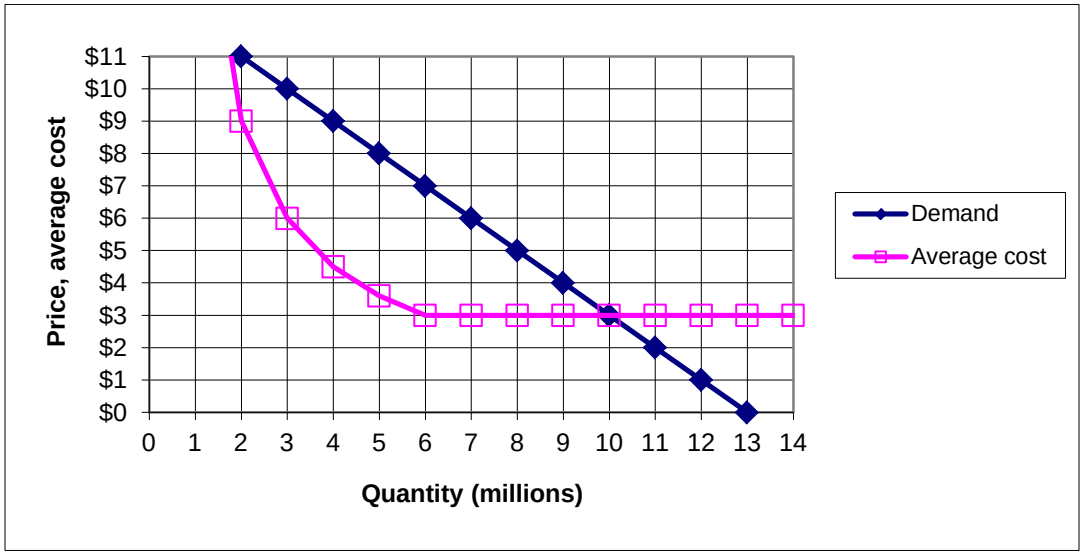
i. Assume Industry B is also a Cournot oligopoly and that the industry's elasticity of demand is also -2. Compute its average Lerner index.

(2) [Equilibrium entry: 25 pts] Suppose annual demand for screwdrivers is given by P = 15 – (Q/20), average and marginal cost is $3, and the market is a (symmetric) Cournot oligopoly. It can be shown that the equilibrium market quantity depends on the number of firms as follows.

Number of firms	Equilibrium market quantity	Equilibrium market price	Annual profit per firm	PDV profit per firm
1	120	$	$	$
2	160	$	$	$
3	180	$	$	$
4	192	$	$	$
5	200	$	$	$

a. Compute the equilibrium market price when the number of firms ranges from 1 through 5. Insert your answers in the table above.
b. Compute the annual profit per firm when the number of firms ranges from 1 through 5. Insert your answers in the table above.
c. Suppose this annual profit continues indefinitely and the firms' discount rate is 10%. Compute the present discounted value of profit per firm when the number of firms ranges from 1 through 5. Insert your answers in the table above. [Hint: The present discounted value of a perpetual annual payment of X at discount rate r is given by X/r.]
d. What is the equilibrium number of firms in this industry when the upfront cost of entry is $1500?
e. What is the equilibrium number of firms in this industry when the upfront cost of entry is $1000?

(3) [Entry barriers and contestable markets: 39 pts] The graph below shows a market where the incumbent firm now produces six million units of output and charges a price of $7. The average cost curve applies to both the incumbent and any other firm that tries to enter this market.



a. What is minimum average cost?	$
b. What is the minimum efficient scale?	million
c. Assume MC=AC and compute the incumbent's Lerner index (or "price-cost margin"). [Hint: By definition, the Lerner index = (P-MC)/P.]	

First, suppose a second firm enters the market and produces three million units of output. Assume the *Bain-Sylos postulate*: the incumbent firm keeps its output level fixed at six million and lets the market price fall.

d. What is the new market price?	$
e. What is the entrant's average cost?	$
f. Does the entrant make a profit or a loss?	
g. How much?	$ million

Alternatively, suppose a second firm enters the market and offers a price of $6. Do not assume the Bain-Sylos postulate. Instead assume the market is *contestable* and the incumbent firm keeps its price fixed at $7.

h. What is the entrant's quantity?	million
i. What is the entrant's average cost?	$
j. Does the entrant make a profit or a loss?	
k. How much?	$ million
l. What price *should* the incumbent set to prevent entry?	$
m. Compute the incumbent's Lerner index (or "price-cost margin") assuming it sets price as in part (l).	

II. Critical thinking [9 pts]

Suppose a market is currently served by only one firm, Firm A, whose average and marginal cost is $5, but whose price is currently $8. Firm B, with similar costs, is considering entering the market. To preserve its monopoly, Firm A tells Firm B that if Firm B enters the market, then Firm A will lower the price to $4 to make sure that Firm B loses money. Is this threat *credible*? Why or why not? Define "credible threat" before answering this question.

[end of quiz]