ECON 120 - Regulation & Antitrust Policy
Drake University, Spring 2023
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Signature: _____

Printed name: _____

EXAMINATION 2 VERSION B
"Antitrust Theory"

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. Multiple choice: Please circle the one best answer to each question. [1 pt each, 16 pts total]

(1) A "natural monopoly" is a firm that enjoys
a. an exclusive government franchise allowing it alone to sell the product.
b. exclusive ownership of a natural resource essential for producing the product.
c. a downward-sloping average cost curve.
d. patent protection.

(2) Suppose a flower vendor with market power is now selling 5 bouquets per hour at a price of $10. If she cuts the price to $9, she can sell one more bouquet per hour (that is, a total of 6 bouquets per hour). The vendor's marginal revenue for the sixth bouquet is therefore
a. $1.
b. $4.
c. $9.
d. $10.
e. $54.

(3) Monopoly causes economic inefficiency because
a. monopoly prices are unfair.
b. it is unfair for one firm to control the market.
c. monopolists are usually wealthier than their customers.
d. some consumers, willing to pay the marginal cost of the product, are not served.
e. monopolists enjoy profits, called monopoly rents, even in the long run.

(4) In the "Structure-Conduct-Performance" paradigm, "Performance" does not include
a. deadweight loss.
b. concentration.
c. technical efficiency.
d. technical progress.

(5) An action by a firm that is judged under the "rule of reason"
a. is always illegal regardless of circumstances.
b. may be illegal if it appears to lessen competition.
c. may be illegal if it increases the firm's profit.
d. may be illegal if it decreases other firms' profits.

(6) When private parties win lawsuits under U.S. antitrust laws, damages are automatically multiplied by
a. one and a half.
b. two.
c. three.
d. four.

(7) In a Nash equilibrium, each firm chooses a strategy that maximizes
a. the combined profit of all the firms.
b. social welfare, including the welfare of consumers.
c. that firm's profit, given the rival firms' chosen strategies.
d. that firm's profit, regardless of the strategy the rival firms might choose.

(8) One implication of the Cournot model of oligopoly is that the equilibrium price is higher,
a. the more firms are in the industry.
b. the more elastic is market demand.
c. both of the above.
d. none of the above.

(9) In the Bertrand model of oligopoly, each firm maximizes its own profit while taking as given
a. the other firms' prices.
b. the other firms' marginal costs.
c. the other firms' quantities.
d. the other firms' profits.

(10) Which of the following is NOT usually a threat to cartel stability?
a. New firms might enter the industry.
b. Member firms might merge.
c. Market demand might shift.
d. Members might cheat on the cartel agreement.

(11) "Tacit collusion" means
a. an agreement to keep prices at the competitive level.
b. an agreement not to advertise.
c. an agreement to quietly change prices.
d. collusion without an oral or written agreement.

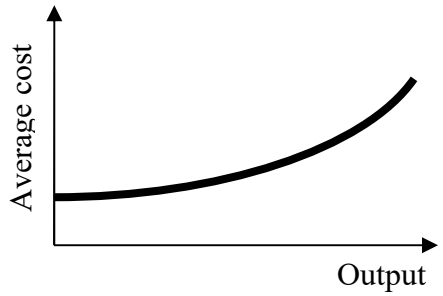
(12) Which market model predicts the highest equilibrium price?
a. Price competition.
b. Collusion to maximize joint profits.
c. Cournot oligopoly.
d. All models predict the same equilibrium price, if all use the same assumptions about market demand and marginal cost.

(13) Under U.S. law, price-fixing is illegal
a. if price is raised significantly above marginal cost.
b. *per se*, except in industries Congress has exempted.
c. if total market quantity is reduced significantly below the competitive quantity.
d. if significant deadweight loss can be shown.

(14) If an industry is a monopoly, its Hirschman-Herfindahl Index (HHI) is
a. negative one.
b. zero.
c. 20.
d. 100.
e. 1,000.
f. 10,000.

(15) Which hypothesis claims that higher industry concentration is *not* associated with a loss of social welfare?
a. collusion hypothesis.
b. differential efficiency hypothesis.
c. Both of the above.
d. None of the above.

(16) The average cost curve in the graph below shows
a. economies of scale.
b. diseconomies of scale.
c. neither economies nor diseconomies of scale.
d. Cannot be determined from information given.



II. Problems: Insert your answer to each question in the box provided. Use margins and graphs 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) [Monopoly, markup formula, Lerner index: 4 pts] Frosty Ice Rink enjoys a local monopoly. Its marginal cost per customer is $6.00. The management believes the elasticity of demand for admission is -4.

a. What admission price should Frosty set, to maximize profit?

$

b. Compute Frosty's Lerner index of market power [(P-MC)/P].

(2) [Antitrust statutes: 8 pts] Insert one of the following statutes in each box. You may insert the same statute into more than one box.

Sherman Act Section 1
Clayton Act Section 7
Sherman Act Section 2
Federal Trade Commission Act Section 5

a. "Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce … is declared to be illegal."	
b. "Unfair methods of competition in or affecting commerce, and unfair or deceptive acts or practices in or affecting commerce, are declared unlawful."	
c. "Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce … shall be deemed guilty of a felony…"	
d. "No corporation engaged in commerce shall acquire, directly or indirectly, the whole or any part of the stock … of another corporation engaged also in commerce, where ... the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly."	

(3) [Measures of concentration: 4 pts] The U.S. Bureau of Transportation Statistics reported the following market share data on airlines' domestic passengers in a recent year.

Airline	Market share
Southwest	20 %
Delta	17 %
American	15 %
United	11 %
SkyWest	5 %

Airline	Market share
JetBlue	4 %
Spirit	4 %
Alaska	4 %
Frontier	3 %
Republic	2 %

The total sums to 85%, but assume the remaining airlines are very small and may be ignored in the following calculations.

a. Compute the four-firm concentration ratio.	%
c. Compute the Hirschman-Herfindahl Index.	

(4) [Cournot duopoly: 14 pts] Suppose a market is served by only two firms: Acme Products Company and Best Products Company. Suppose the two firms form a *symmetric Cournot duopoly*, each firm setting its own quantity while taking the other firm's quantity as given. Let q_A = Acme's quantity and q_B = Best's quantity, so that total market quantity $Q = q_A + q_B$. The market demand curve is **$P = 14 – (Q/10)$.** Each firm has constant marginal and average cost equal to **$2**. Circle your final answers. Use the space at the bottom of the next page for scratch work.

a. Find an expression for Acme's revenue, as a function of its own quantity and the quantity produced by the other firm: $TR_A(q_A,q_B)$. [Hint: By definition, $TR_A = P\ q_A$. Here, replace P by the equation for the demand curve, and then replace Q by $(q_A + q_B)$.]

b. Find an expression for Acme's marginal revenue, as a function of its own quantity and the quantity produced by the other firm: $MR_A(q_A,q_B)$. [Hint: $MR_A = dTR_A / dq_A$.]

c. Find an expression for Acme's reaction function (or best reply function), showing how much Acme will produce for any given level of quantity set by the other firm: $q_A^* = f(q_B)$. [Hint: Set $MR_A = MC$ and solve for q_A as a function of q_B .]

d. Assume the equilibrium is symmetric (that is, assume $q_A^* = q_B^*$) and compute Acmes's equilibrium quantity q_A^*.

Question continues on next page.

e. Compute total market quantity Q* and the equilibrium price P*.

f. Compute the Lerner index (or "price-cost margin," (P-MC)/P).

g. Compute the social deadweight loss from Cournot duopoly.

(5) [Joint profit maximization: 10 pts] Suppose the two firms in the previous problem form a cartel to maximize the sum of their profits. Show your work and circle your final answers.

a. Find the cartel's marginal revenue function.

b. Compute the cartel's profit-maximizing level of output Q*.

c. Compute the cartel's profit-maximizing price P*.

d. Compute the cartel's Lerner index (or "price-cost margin," (P-MC)/P).

e. Compute the social deadweight loss from the cartel.

(6) [Equilibrium entry: 14 pts] Suppose annual demand for wheelbarrows is given by P = 32 – (Q/10), marginal and average cost is **$2**, 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	Quantity per firm	Annual profit per firm	PDV profit per firm
1	150	$17.00	150	$	$
2	200	$12.00	100	$	$
3	225	$9.50	75	$	$
4	240	$8.00	60	$	$
5	250	$7.00	50	$	$

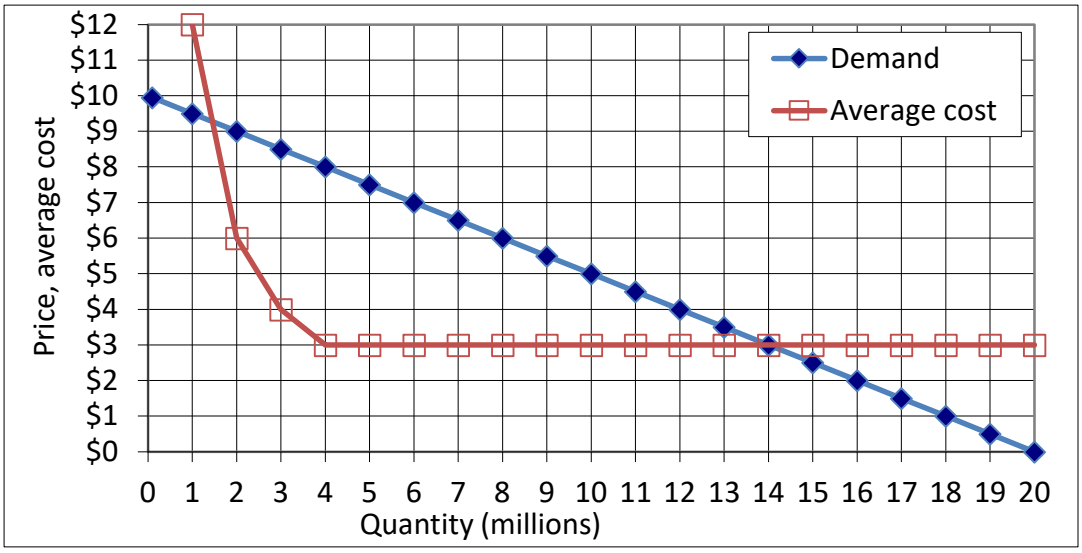
a. [5 pts] Compute the annual profit per firm when the number of firms ranges from 1 through 5. Insert your answers in the table above.

b. [5 pts] 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.]

c. [2 pts] What is the equilibrium number of firms in this industry when the upfront cost of entry is $5,000? _____ firms

d. [2 pts] What is the equilibrium number of firms in this industry when the upfront cost of entry is $20,000? _____ firms

(7) [Entry barriers and contestable markets: 26 pts] The graph below shows a market where the incumbent firm now produces eight units of output and sets a price of $6. The average cost curve applies to the incumbent and to 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," (P-MC)/P.)	

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

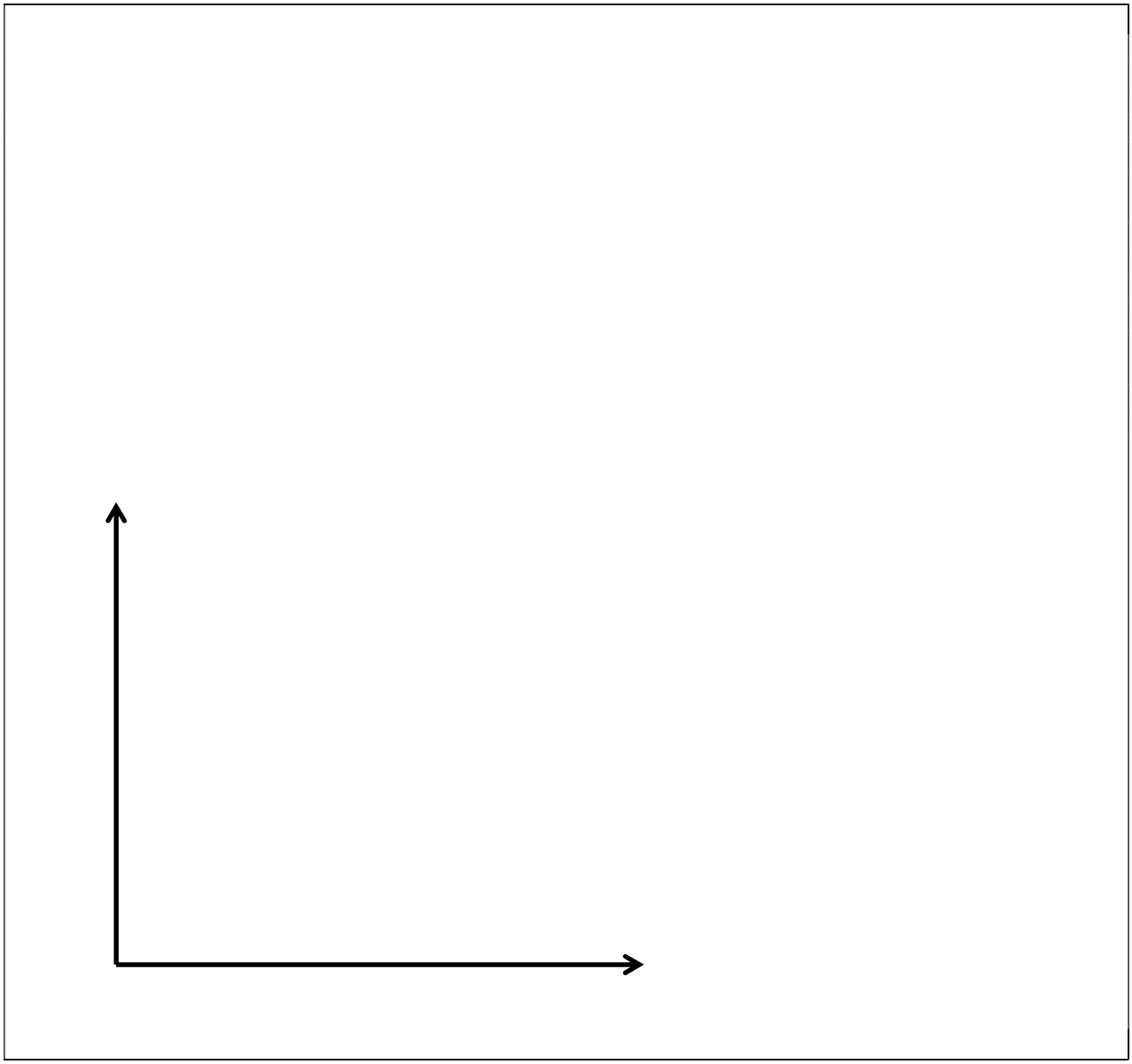
Alternatively, suppose a second firm enters the market and offers a price of $4. Do not assume the Bain-Sylos postulate. Instead assume the market is *contestable* and the incumbent firm keeps its price fixed at $6.

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).	

III. Critical thinking: Write a one-paragraph essay answering *one* question below (your choice). Full credit requires correct economic reasoning, legible writing, good grammar including complete sentences, and accurate spelling. [4 pts]

(1) Reconsider problem (3) above on measures of concentration. The data show market shares for the entire U.S. If our goal is to measure how competitive the airline market is, then are these the best data to compute measures of concentration? If not, what data would you prefer to have? Explain your answer. (Ignore the graph.)

(2) Reconsider problem (4) above on Cournot duopoly. Suppose alternatively that each firm sets its *price* while taking the other firm's *price* as given. What is the Nash equilibrium under these alternative assumptions? What is the equilibrium market price? What is the equilibrium total market quantity? Explain why your answer is different from the answer you gave in problem (4). Draw a graph of market demand and marginal cost, and the label the equilibrium point.



[end of exam]