

EXAMINATION #4 VERSION B
"Perfect and Imperfect Competition"
April 23, 2012

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators or calculators with alphabetical keyboards are NOT permitted. Cell phones or other wireless devices are NOT permitted. Point values for each question are noted in brackets. Points will be subtracted for illegible writing or incorrect rounding. Maximum total points are 100.

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

(1) Suppose there is a change in government policy affecting the automobile industry. Which of the following outcomes would pass the *compensation test of Kaldor and Hicks*?

- a. Producers gain \$10 billion while consumers lose \$20 billion.
- b. Producers gain \$20 billion while consumers lose \$10 billion.
- c. Producers gain \$10 billion while consumers gain \$20 billion.
- d. Both (b) and (c).
- e. All of the above.

(2) A perfectly competitive firm expects that if it increases its output, this will cause the price to

- a. stay the same.
- b. increase.
- c. decrease.
- d. cannot be determined from information given.

(3) Suppose that for some reason, at current levels of output, Firm A's marginal cost is \$10 and Firm B's marginal cost is \$4. If one unit of output is shifted from Firm A to Firm B, then total industry costs will

- a. increase by \$4.
- b. increase by \$6.
- c. remain unchanged.
- d. decrease by \$4.
- e. decrease by \$6.

(4) In a perfectly-competitive economy, a poor person's marginal rate of substitution between any two goods is always

- a. greater than a rich person's marginal rate of substitution.
- b. less than a rich person's marginal rate of substitution.
- c. equal to a rich person's marginal rate of substitution.
- d. zero.

(5) If the economy is perfectly competitive in all markets, it is always

- a. outside the production-possibility curve.
- b. on the production-possibility curve.
- c. inside the production-possibility curve.
- d. cannot be determined from the information given.

(6) Suppose the price of a pair of jeans is \$30 and the price of a teeshirt is \$6. If the economy is perfectly competitive, then these prices indicate that the *economy's* opportunity cost of a pair of jeans is

- a. 1/5 of a teeshirt.
- b. 1/6 of a teeshirt.
- c. 1 teeshirt.
- d. 5 teeshirts.
- e. 6 teeshirts.

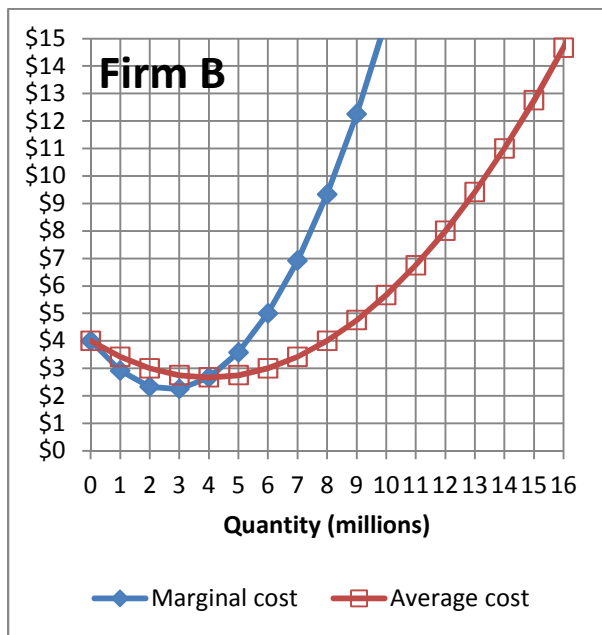
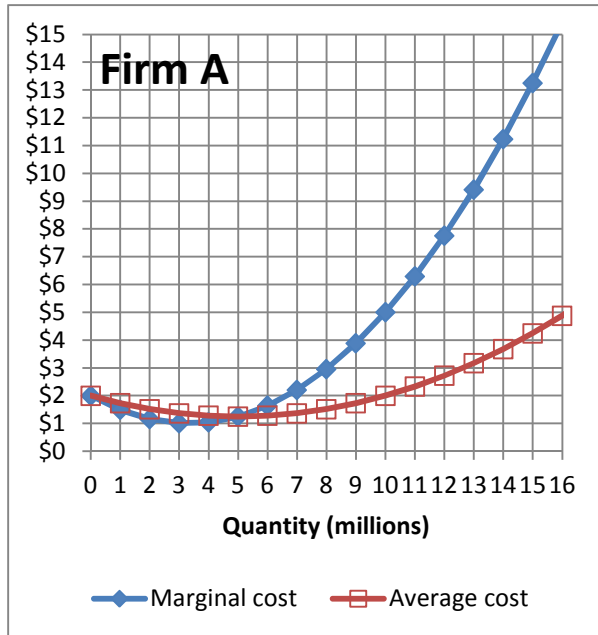
(7) A "natural monopoly" is a firm that enjoys

- a. exclusive ownership of a natural resource essential for producing the product.
- b. a downward-sloping average cost curve.
- c. patent protection.
- d. an exclusive government franchise allowing it alone to sell the product.

(8) Suppose a hotdog vendor sells 20 hotdogs per hour if the price is \$2, and sells 21 hotdogs if the price is \$1.95. The vendor's marginal revenue of the 21st hotdog is therefore

- a. \$0.05 .
- b. \$0.95 .
- c. \$1.00 .
- d. \$1.95 .
- e. \$2.00 .
- f. \$20.00 .

(2) [Economy-wide efficiency: 12 pts] Suppose there are two firms in the industry producing baseball caps, with the marginal cost curves and average cost curves shown in the graph below.



- Suppose Firm A is currently producing 8 million baseball caps. If Firm A increases production by one baseball cap, by how much will its total costs increase? (Give an answer to the nearest whole dollar.)
- Suppose Firm B is currently producing 8 million baseball caps. If Firm B increases production by one baseball cap, by how much will its total costs increase? (Give an answer to the nearest whole dollar.)

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First assume the firms' output levels must be set by a government planner. The planner wants the firms to produce a total of 16 million baseball caps, but total industry cost (that is, the combined costs for both firms) must be as low as possible.

- Which firm should be instructed to produce more output—Firm A or Firm B, or should they produce an equal amount of output to make total industry cost as low as possible?
- How much output should Firm A produce?
- How much output should Firm B produce?

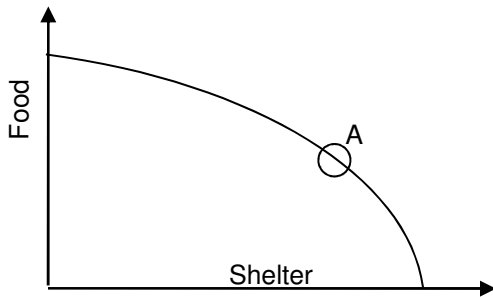
million	
million	

Alternatively assume there is no government planner. Assume instead that the two firms are competitive and that they each maximize their own profit while taking price as given.

- What price for baseball caps will motivate the two firms to produce a total of 16 million baseball caps at lowest total industry cost?

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(3) [Economy-wide efficiency, PP curves: 10 pts] The graph below shows the production possibility (PP) curve for an economy. Suppose the economy is at point A and the slope of the PP curve at that point is -2 .



- a. Starting from point A, if this economy were to produce 60 more units of shelter, it would have to reduce production of food. By how many units?
- b. Starting from point A, if this economy were to produce 60 more units of food, it would have to reduce production of shelter. By how many units?

	units of food
	units of shelter

Suppose the price of shelter is \$ 20 and the price of food is \$ 5. Clearly, some market in this economy is *not* functioning properly.

- c. What is the slope of every consumer's budget line, with shelter on the horizontal axis and food on the vertical axis? [Hint: the slope of the consumer's budget line, with shelter on the horizontal axis and food on the vertical axis, equals the *price of shelter divided by the price of food*.]
- d. What must be the marginal rate of substitution of shelter for food for every consumer in this economy? (Give a number.)
- e. Which of the following is true? Choose one. [Hint: First sketch the typical consumer's indifference curve in the graph above.]
 - (i) People in this economy could be made better off if it produced more shelter and less food.
 - (ii) People in this economy could be made better off if it produced less shelter and more food.
 - (iii) This economy is already producing an efficient mix of outputs.

(4) [Monopoly price discrimination: 10 pts] Suppose a movie theatre sells tickets to both students and the general public. The theatre believes the elasticity of demand by students is -7 , and the elasticity of demand by the general public is -1.5 .

- a. If the price is increased by 2%, what will be the approximate decrease in tickets sold to students?
- b. If the price is increased by 2%, what will be the approximate decrease in tickets sold to the general public?

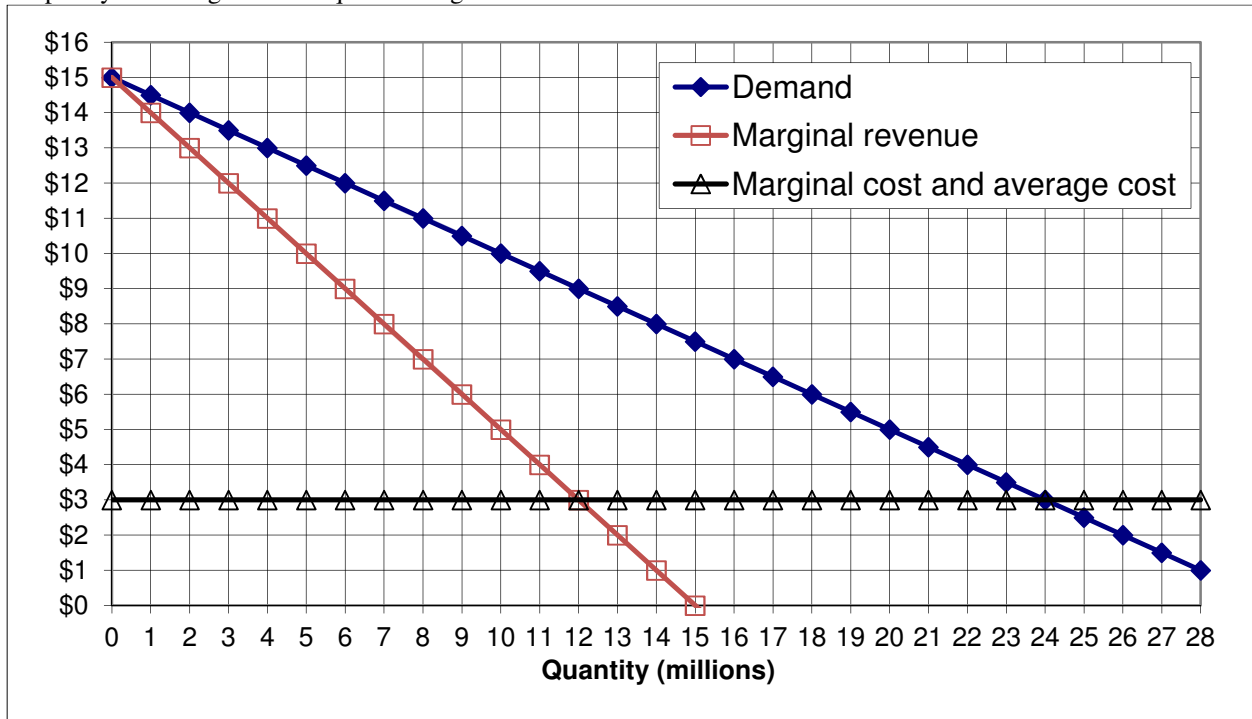
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Assume the marginal cost of a seat in the movie theatre is \$ 3.

- c. If the theatre wants to maximize profit, which group will get the higher price?
- d. Compute the profit-maximizing ticket price for students.
- e. Compute the profit-maximizing ticket price for the general public.

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(5) [Monopoly, perfect price discrimination: 18 pts] Suppose Acme High-tech Company has a patent for a particular high-tech device. Its demand, marginal revenue, and marginal cost curves are shown below. Assume for simplicity that marginal cost equals average cost.



First, assume Acme must charge the *same price* to all its customers.

- What quantity should Acme produce to maximize profits?
- What price should Acme charge?
- Compute Acme's profit.
- Compute the deadweight loss from single-price monopoly.

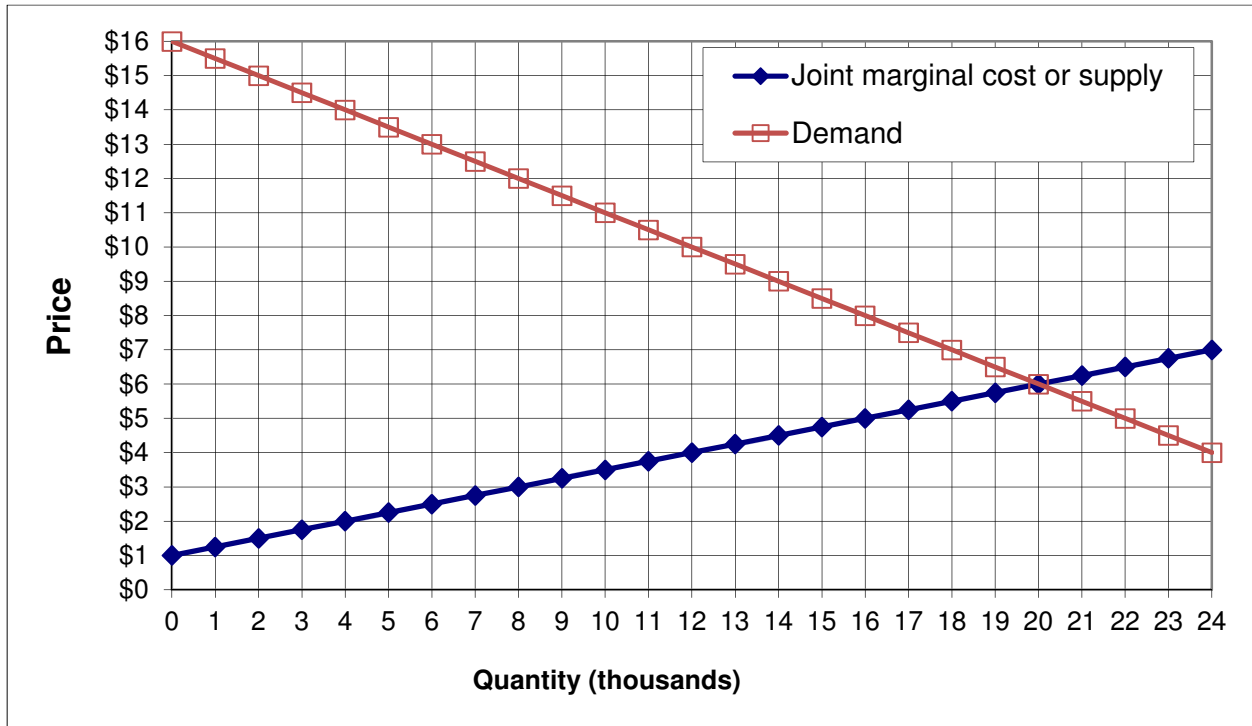
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\$	million
\$	million

Now, alternatively assume that Acme can charge a different price to each customer, based on what that customer is willing to pay. In other words, Acme can engage in *perfect price discrimination*.

- What is the highest price Acme will charge any customer? (Give an answer to the nearest whole dollar.)
- What is the lowest price Acme will charge any customer? (Give an answer to the nearest whole dollar.)
- What quantity will Acme produce to maximize profit?
- Compute Acme's profit.
- Compute the deadweight loss from monopoly with perfect price discrimination.

\$	
\$	
	million
\$	million
\$	million

(6) [Competition versus collusion: 16 pts] Suppose a small group of firms produce laundry soap. The graph below shows the demand curve for laundry soap, and the joint marginal cost or supply curve of the group of firms.



First, assume the firms *compete* with each other, each maximizing its own profit while taking the market price as given.

a. What will be the equilibrium market quantity?

	thousand
b. If output increased by one more unit at any firm, total costs would increase by how much?	\$
c. What will be the equilibrium market price?	\$

Now, alternatively assume the firms *collude* with each other, setting price jointly as a cartel to maximize the sum of their profits.

d. *Using a straightedge*, draw and label the colluding firms' marginal revenue curve.

e. What total quantity will the firms produce?

f. If output increased by one more unit at any firm, total costs would increase by how much?

g. What price will the firms jointly set?

h. Compute the deadweight loss from collusion.

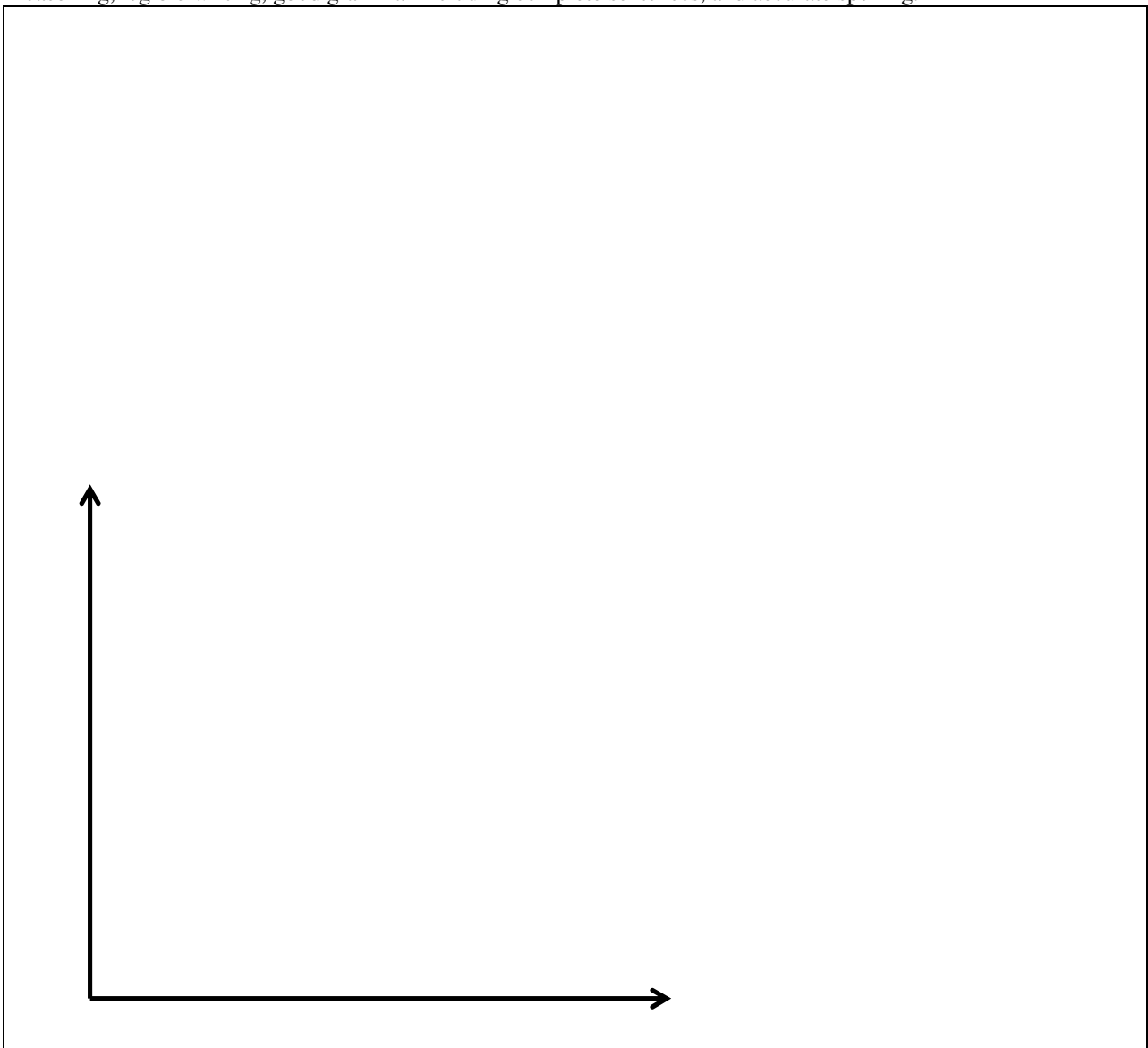
	thousand
f. If output increased by one more unit at any firm, total costs would increase by how much?	\$
g. What price will the firms jointly set?	\$
h. Compute the deadweight loss from collusion.	\$ thousand

III. Critical thinking: Answer one question below (your choice). [6 pts]

- (1) Suppose an economy produces only two products: food and housing.
 - a. Draw a production-possibility curve for this economy, a representative giant consumer's indifference curve tangent to it, and the point of tangency.
 - b. Suppose both markets are competitive. Where will the economy be in this graph? Label that point "C."
 - c. Suppose the market for food is competitive, but the market for housing is a monopoly. Where will the economy be in this graph? Label that point "M."

- (2) The Des Moines Arts Festival features craft artists producing handmade jewelry, clothing, sculpture, etc.
 - a. Do craft artists produce "differentiated products"? Why or why not?
 - b. Is price equal to marginal cost for craft artists? Why or why not?
 - c. Is price equal to average cost for craft artists? Why or why not?

Please circle the question you are answering. Write your answer below. Full credit requires correct economic reasoning, legible writing, good grammar including complete sentences, and accurate spelling.



[end of exam]