

EXAMINATION 4 VERSION B
"Perfect and Imperfect Competition"
November 29, 2021

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators, calculators with alphabetical keyboards, wireless devices and mobile phones are NOT permitted. Numerical answers, if rounded, must be correct to at least 3 significant digits. Point values for each question are noted in brackets. Maximum total points are 100.

I. Multiple choice: Please circle the one best answer to each question. [1 pt each, 14 pts total]

(1) A perfectly competitive firm expects that if it reduces its output, the price will

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

(2) In a perfectly competitive market, buyers view the outputs of different firms as

- a. differentiated products.
- b. perfect complements.
- c. perfect substitutes.
- d. perfect squares.

(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 \$6. 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, the slope of a rich person's budget line is always

- a. zero.
- b. less than the slope of a poor person's budget line.
- c. equal to the slope of a poor person's budget line.
- d. greater than the slope of a poor person's budget line.

(5) 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.

(6) 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.

(7) Suppose a flower vendor now sells 10 bouquets per hour at the price of \$15. If the vendor drops the price to \$14, the vendor can sell 11 bouquets per hour. The marginal revenue of the 11th bouquet is therefore

- a. \$4 .
- b. \$10.
- c. \$14 .
- d. \$15 .

(8) Suppose a firm faces a demand curve given by the equation $P = 20 - Q/100$. Then the firm's marginal revenue curve is given by the equation

- a. $MR = 10 - Q/50$.
- b. $MR = 20 - Q/50$.
- c. $MR = 10 - Q/100$.
- d. $MR = 20 - Q/100$.

- (9) At its current level of output, Acme Manufacturing's marginal revenue is \$5 and its marginal cost is \$7. Acme can increase its profit by
- increasing output.
 - decreasing output.
 - Acme cannot increase profit by either increasing or decreasing output.
 - Cannot be determined from information given.

- (10) Economists are opposed to monopolies because monopolies
- make the rich richer, and the poor poorer.
 - make people buy things that people don't really want.
 - advertise too much.
 - create unhealthy concentration of social power.
 - set prices that exclude some buyers who are willing to pay the marginal cost.
 - All of the above.

- (11) Perfect price discrimination
- ensures that every consumer willing to pay the marginal cost is served.
 - reduces output below the level set by a single-price monopolist.
 - reduces monopoly profit.
 - maximizes social deadweight loss.
 - maximizes consumer surplus.

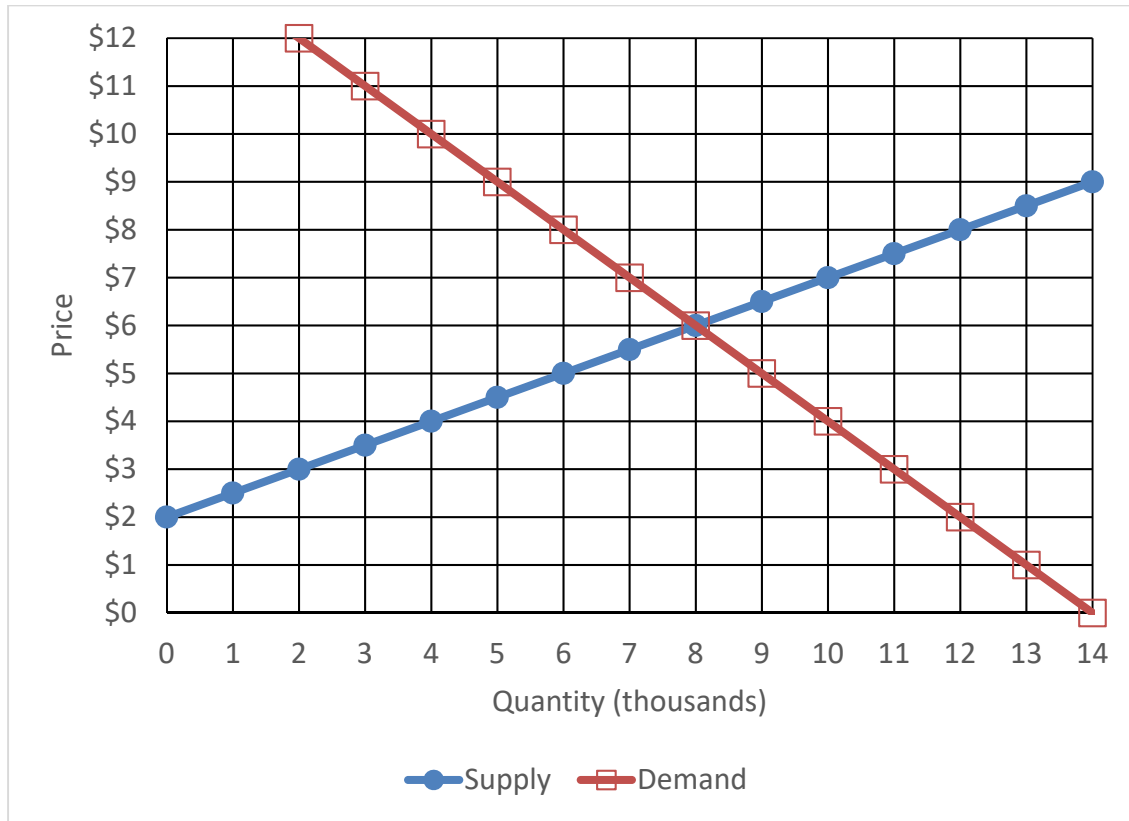
- (12) After a cartel agreement is reached, each cartel member has an incentive to cheat by
- shutting down all production.
 - producing more than its quota of output.
 - producing less than its quota of output.
 - raising its price higher than the cartel's agreed price.

- (13) Which of the following is NOT illegal under U.S. antitrust laws?
- Mergers that lessen competition.
 - Cartels.
 - Predatory pricing.
 - Monopolies.

- (14) The Cournot model of oligopoly predicts that as the number of firms in an industry decreases, the market price
- approaches zero.
 - approaches marginal cost.
 - approaches the monopoly price.
 - remains constant.

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) [Efficiency of competition: 16 pts] The following graph shows the market for can openers.



Suppose only 4,000 can openers were produced for some unknown reason.

- How much would consumers be willing to pay for a 4001st can opener?
- By how much would the can opener industry's total costs increase from producing a 4001st can opener?
- If the 4001st can opener were produced, would total surplus *increase*, *decrease*, or *remain constant*?
- By how much?

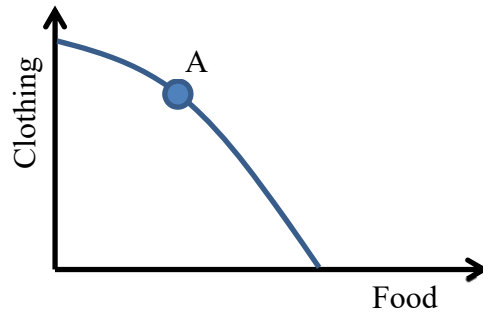
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Alternatively, suppose 12,000 can openers were produced for some unknown reason.

- How much were consumers willing to pay for the 12,000th can opener?
- How much would the can opener industry's total cost decrease from NOT producing the 12,000th can opener?
- If the 12,000th can opener were NOT produced, would total surplus *increase*, *decrease*, or *remain constant*?
- By how much?

\$
\$
\$

(2) [Economy-wide efficiency: 14 pts] The graph below shows a country's production possibility curve. The country is currently at point A, where the slope equals $-1/3$.



- a. What is this **country's** opportunity cost of a unit of food?
- b. What is this **country's** opportunity cost of a unit of clothing?

units of clothing
units of food

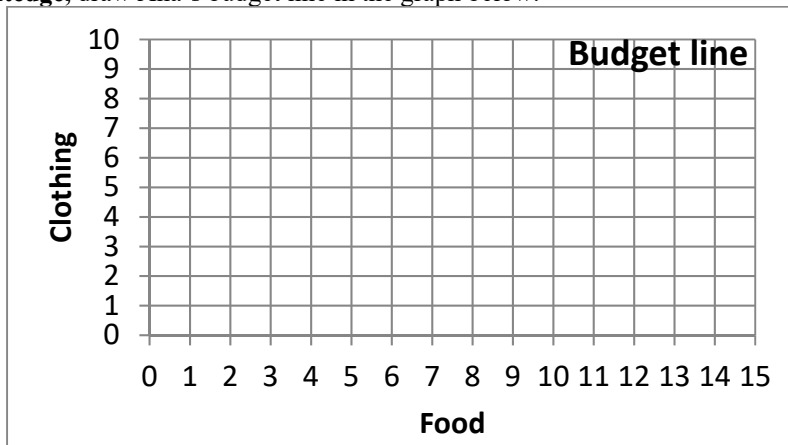
Assume this country's economy is in competitive equilibrium in all markets and the price of a unit of clothing is \$6.

- c. What must be the price of a unit of food?

\$

Ana is a consumer in this economy. She has an income of \$30.

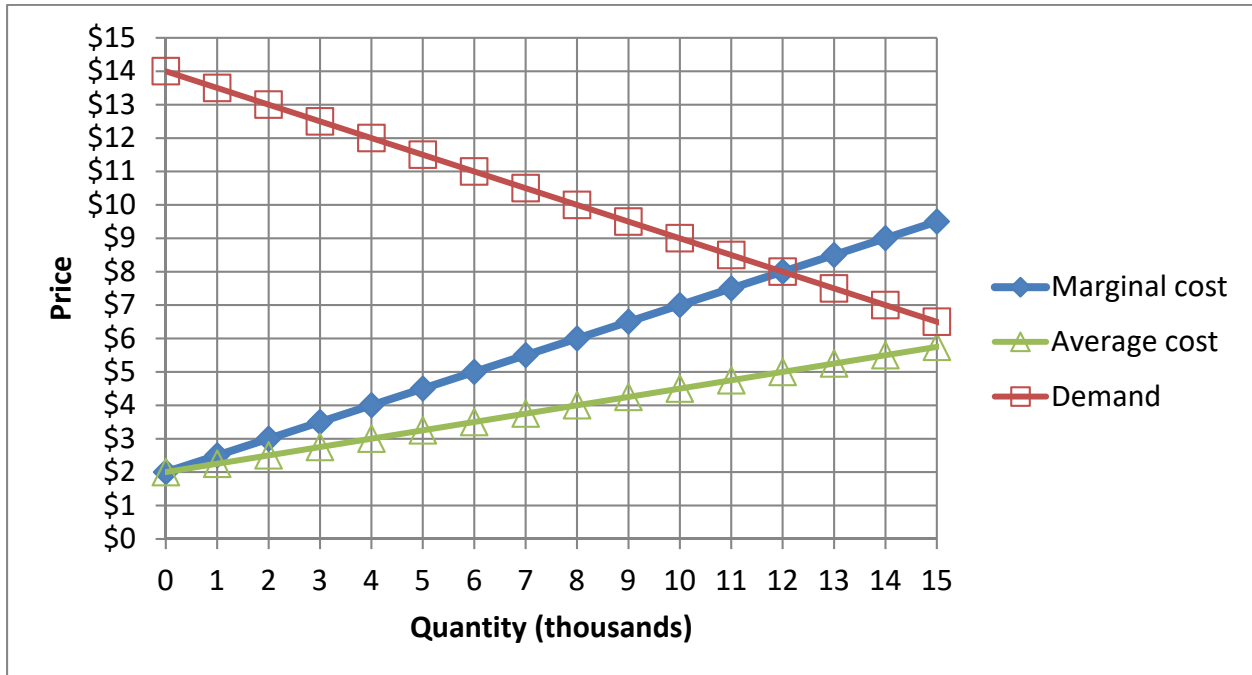
- d. Using a straightedge, draw Ana's budget line in the graph below.



- e. What is **Ana's** opportunity cost of a unit of food?
- f. What is **Ana's** opportunity cost of a unit of clothing?
- g. Sketch an indifference curve tangent to Ana's budget line. What is the slope of that indifference curve (that is, Ana's marginal rate of substitution) at the tangency point?

units of clothing
units of food

(3) [Monopoly: 12 pts] MoviePlex is the only movie theatre in town, so it enjoys a local monopoly. Its marginal cost, average cost, and demand curves are shown below.



Assume that MoviePlex must charge the same price on every movie admission sold.

- Using a straightedge, draw and label MoviePlex's marginal revenue curve.
- Compute MoviePlex's profit-maximizing quantity.
- Compute the price that MoviePlex would charge.
- Compute MoviePlex's profits.
- Compute consumer surplus
- Compute the social deadweight loss.

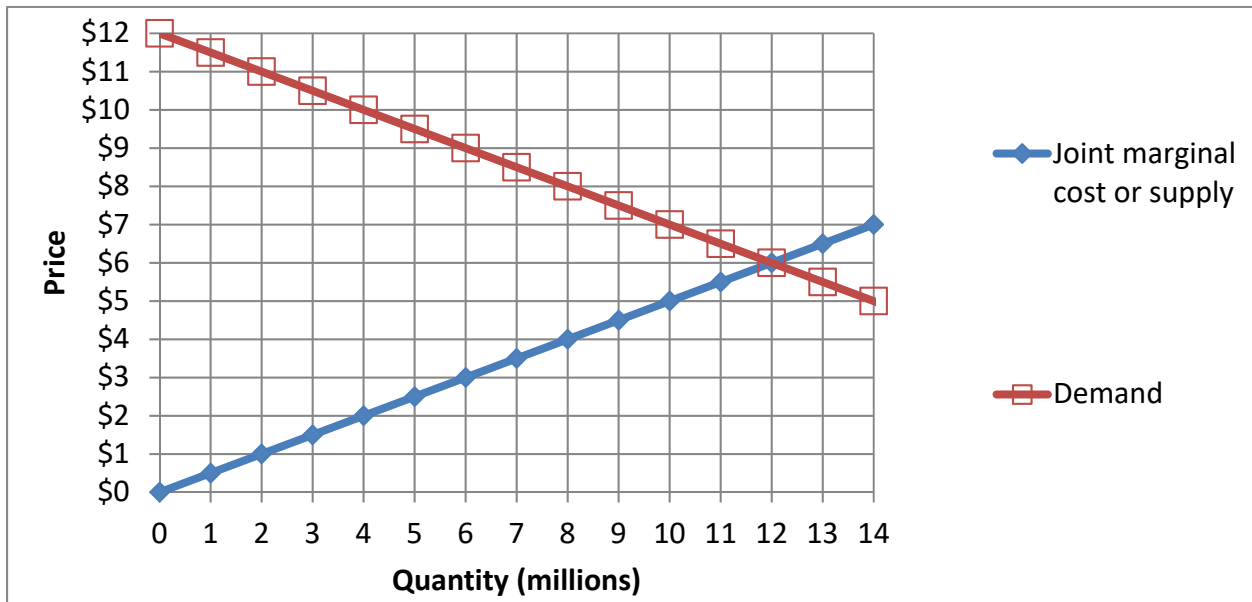
	thousand
\$	
\$	thousand
\$	thousand
\$	thousand

(4) [Monopoly price discrimination: 4 pts] Suppose the Nutcracker Ballet sells tickets to both children and adults. The ballet believes the elasticity of demand by children is -10 , and the elasticity of demand by adults is -3 . Assume the ballet's marginal cost of a ticket is \$18.

- Compute the profit-maximizing ticket price for children.
- Compute the profit-maximizing ticket price for adults.

\$	
\$	

(5) [Competition versus collusion: 16 pts] Suppose a small group of firms produce laundry soap. The graph below shows the demand curve 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?

	million
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?	\$

Second, 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?

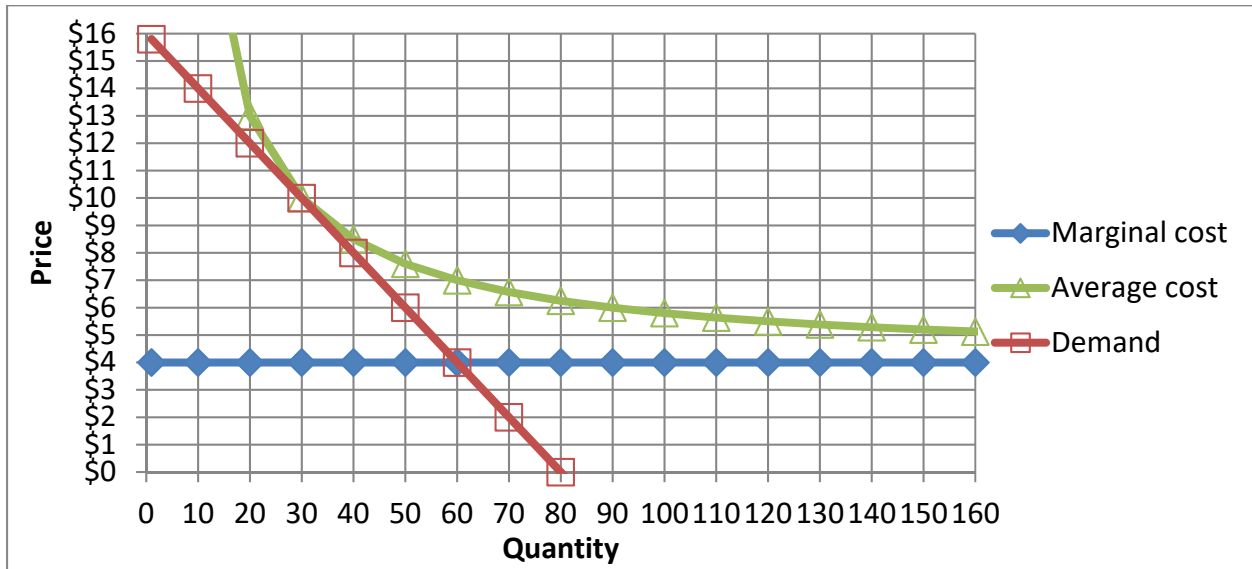
f. If output increased by one more unit at any firm, total costs would increase by how much?

g. What price will the firms jointly set?

h. Compute the social deadweight loss from collusion.

	million
	\$
	\$
	\$ million

(6) [Monopolistic competition: 20 pts] Brian sells sandwiches from a food truck downtown. The graph below shows his cost curves and demand curve.



a. Although there are other food trucks downtown, Brian's demand curve slopes down. Does that indicate that consumers view sandwiches from different trucks as *perfect substitutes* or *differentiated products*?

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First suppose that Brian sets a price of \$4, for some unknown reason.

- b. How many sandwiches will he sell?
- c. Will Brian make a *profit* or a *loss* ?
- d. How much?

sandwiches
\$

Now suppose that Brian sets a price to maximize his profit.

- e. *Using a straightedge*, draw and label Brian's marginal revenue curve.
- f. How many sandwiches will Brian sell?
- g. What price will Brian set?
- h. What is Brian's marginal cost?
- i. What is Brian's average cost?

sandwiches
\$
\$
\$

j. Brian clearly has market power (that is, the power to set price) because his demand curve slopes down. So why does he have zero economic profit, unlike a monopolist? Give the most plausible explanation.

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III. Critical thinking: Write a one-paragraph essay answering *one* question below (your choice). [4 pts]

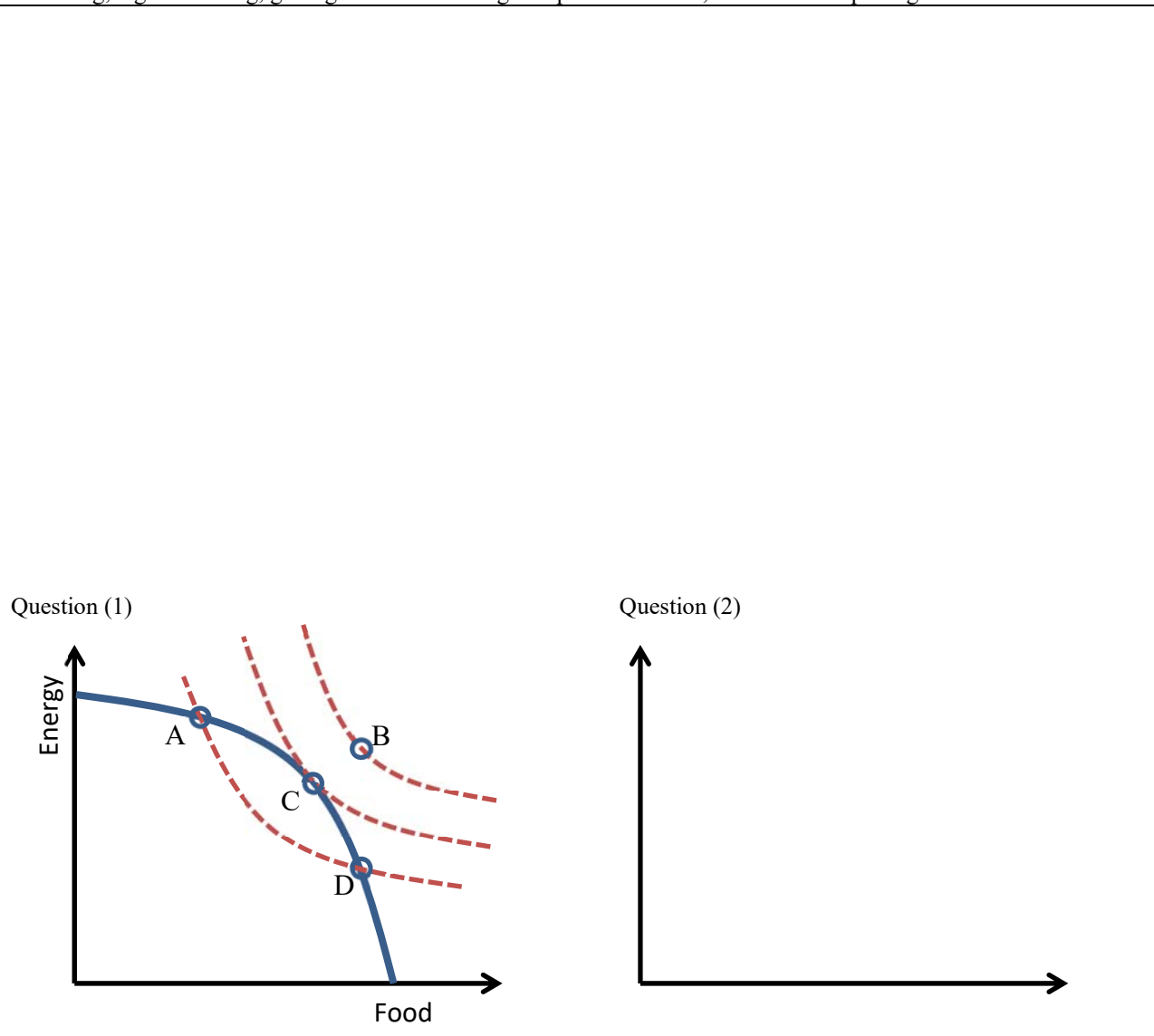
(1) The graph below at left describes the economy of Fredonia. The solid curve is Fredonia's production possibility curve and the dashed curves are indifference curves for a representative consumer.

- a. Which point (A, B, C, D, or E) corresponds to competitive markets for both food and energy? Why?
- b. Which point corresponds to competition in the market for food but monopoly in the market for energy? Why?

(2) Consider the following statement. "Perfect competition is only the 'law of the jungle.' Unregulated competition drives profit to zero in a race to the bottom. If the government would allow firms to set prices cooperatively, everyone would benefit and society would be better off."

- a. Do you agree or disagree? Why?
- b. Illustrate your answer with a supply-and-demand graph below at right, using the concept of deadweight loss.

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]