

**EXAMINATION 4 VERSION A**  
**"Perfect and Imperfect Competition"**  
**May 1, 2024**

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators, calculators with alphabetical keyboards, cell phones, and wireless devices 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, 12 pts total]

(1) If consumers view the products of different firms as *perfect substitutes*, they will

- a. buy some of each.
- b. choose whichever is cheaper.
- c. stay with their current brand, even if it is a little more expensive.
- d. flip a coin to decide which brand to buy.

(2) Suppose the athletic socks industry is *perfectly competitive* and the price of a pair of athletic socks is \$3. Then any firm in the paper industry believes its marginal revenue is

- a. more than \$3 per pair.
- b. less than \$3 per pair.
- c. exactly equal to \$3 per pair.
- d. zero.

(3) Firms X and Y both produce printer paper, but for some unknown reason, Firm X's marginal cost is \$3 per ream and Firm Y's marginal cost is \$5. If one ream of output is shifted from Firm X to Firm Y, then total industry costs will

- a. increase by \$2.
- b. increase by \$3.
- c. increase by \$5.
- d. decrease by \$2.
- e. decrease by \$3.
- f. decrease by \$5.

(4) Suppose the price of a calculator is \$6 and the price of a flashdrive is \$2. If the economy is perfectly competitive, then these prices indicate that the *economy's* opportunity cost of a calculator is

- a. 1/2 of a flashdrive.
- b. 1/3 of a flashdrive.
- c. 1 flashdrive.
- d. 2 flashdrives.
- e. 3 flashdrives.

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

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

(6) 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 .

(7) A monopolist always sets price

- a. equal to marginal cost.
- b. above marginal cost.
- c. below marginal cost.
- d. cannot be determined from the information given.

(8) Perfect price discrimination is impractical because a monopolist

- a. cannot know how much each customer is willing to pay for the product.
- b. always has a marginal cost greater than anyone's willingness to pay.
- c. is not really interested in maximizing profit.
- d. faces downward-sloping demand.

(9) Cartels are organizations of firms that try to increase their members' profits by

- a. boosting output.
- b. increasing advertising.
- c. offering discounts and promotional pricing.
- d. reducing output.
- e. sharing technology.

(10) Antitrust laws prohibit

- a. dishonest accounting practices.
- b. deceptive advertising
- c. anticompetitive practices.
- d. all of the above.

(11) The Cournot model of oligopoly predicts that as the number of firms increases in an industry, the market price

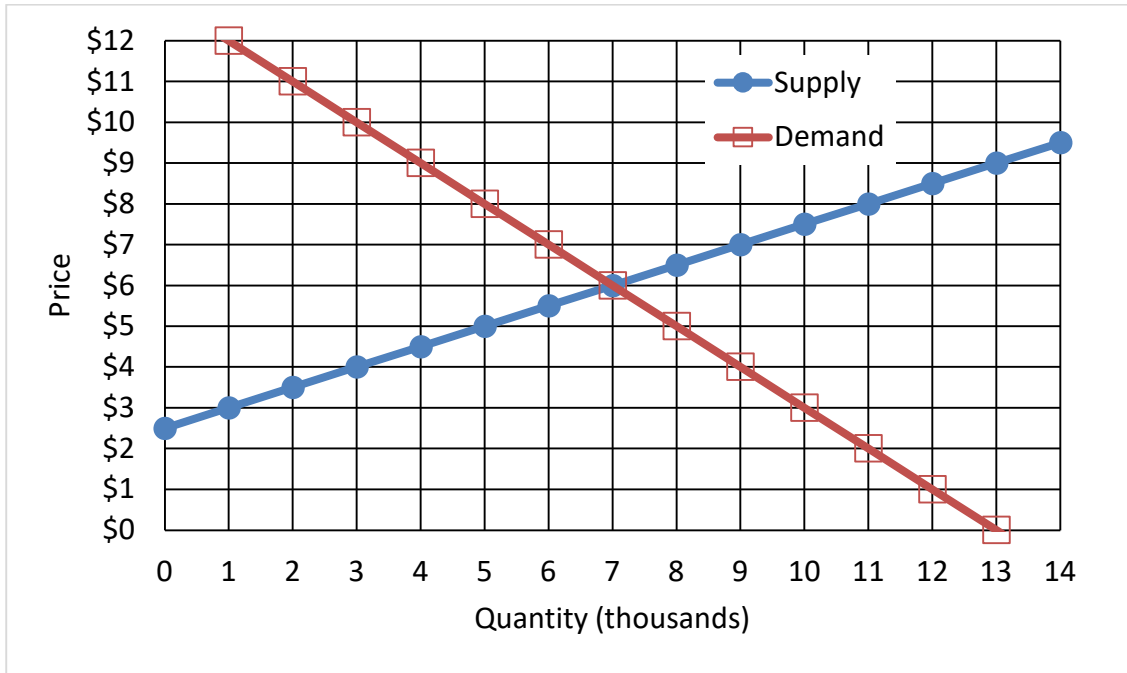
- a. approaches zero.
- b. approaches marginal cost.
- c. approaches the monopoly price.
- d. remains constant.

(12) Products are said to be "differentiated" if

- a. one can buy them in fractional amounts.
- b. consumers do not view them as perfect substitutes.
- c. they are sold through different retail channels (stores, online, catalogs, etc.)
- d. different consumers buy different quantities of them.

**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 flower pots.



Suppose only 3000 flower pots were produced for some unknown reason.

- a. How much would consumers be willing to pay for a 3001st flower pot?
- b. By how much would the flower pot industry's total costs increase from producing a 3001st flower pot?
- c. If the 3001st flower pot were produced, would total surplus *increase*, *decrease*, or *remain constant*?
- d. By about how much? (Give a whole number answer.)

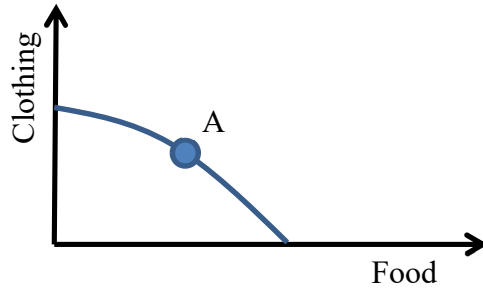
	\$
	\$
	\$

Alternatively, suppose 9,000 flower pots were produced for some unknown reason.

- e. How much were consumers willing to pay for the 9,000th flower pot?
- f. How much would the flower pot industry's total cost decrease from NOT producing the 9,000th flower pot?
- g. If the 9,000th flower pot were NOT produced, would total surplus *increase*, *decrease*, or *remain constant*?
- h. By about how much? (Give a whole number answer.)

	\$
	\$
	\$

(2) [Economy-wide efficiency: 16 pts] The graph below shows a country's production possibilities curve. The country is currently at point A, where the slope equals  $-1/2$ .



**Production possibilities curve**

- 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

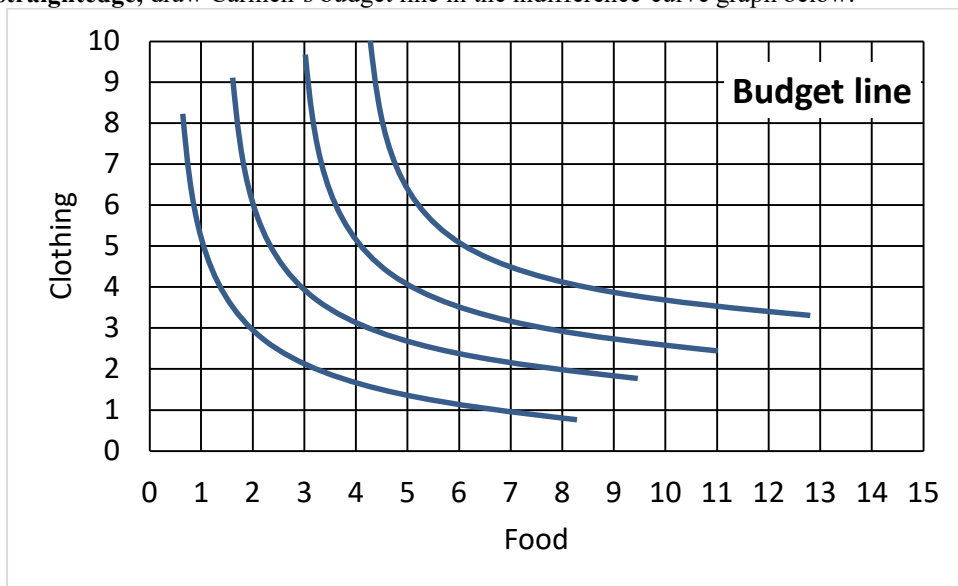
Assume this country's economy is in competitive equilibrium in all markets and the price of a unit of food is \$4.

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

\$
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Carmen is a consumer in this economy. She has an income of \$40.

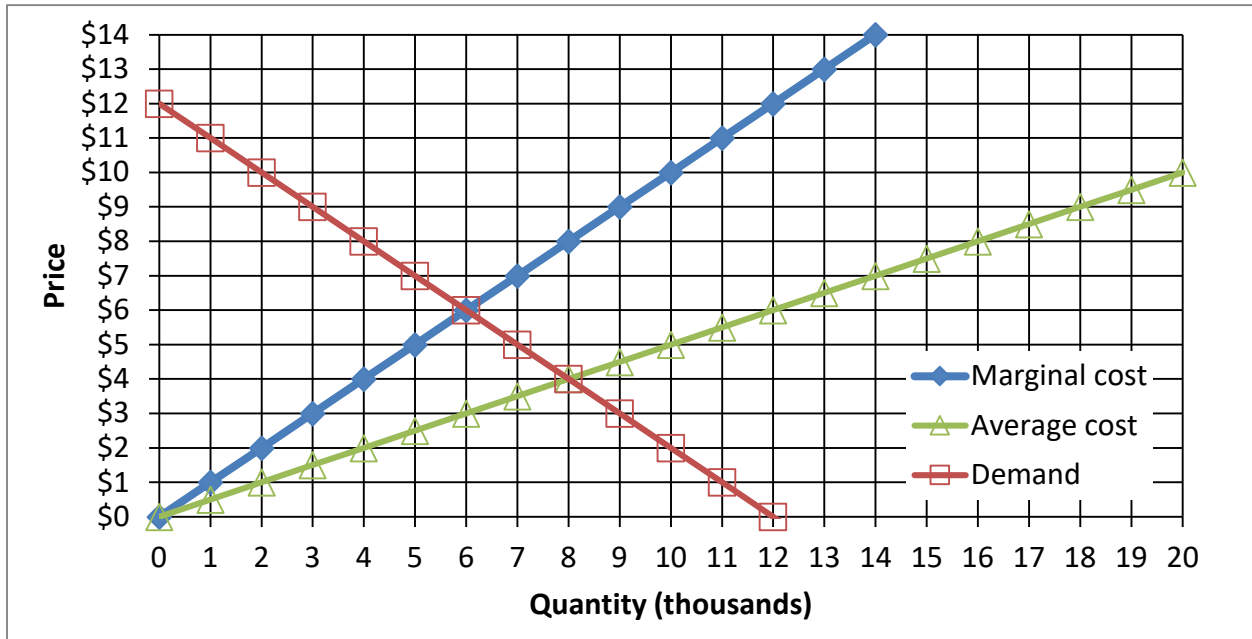
- d. **Using a straightedge**, draw Carmen's budget line in the indifference-curve graph below.



- e. What is **Carmen's** opportunity cost of a unit of food?
- f. What is **Carmen's** opportunity cost of a unit of clothing?
- g. How many units of clothing will Carmen choose to purchase?
- h. At **Carmen's** chosen bundle, what is her marginal rate of substitution, that is, the  $|\text{slope}|$  of her indifference curve at her chosen bundle? (Give a number.)

units of clothing
units of food
units of clothing

(3) [Monopoly: 12 pts] Better Putter Mini-golf course is the only mini-golf course in town, so it enjoys a local monopoly. Its marginal cost, average cost, and demand curves are shown below.



Assume that the mini-golf course must charge the same price on every admission sold.

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

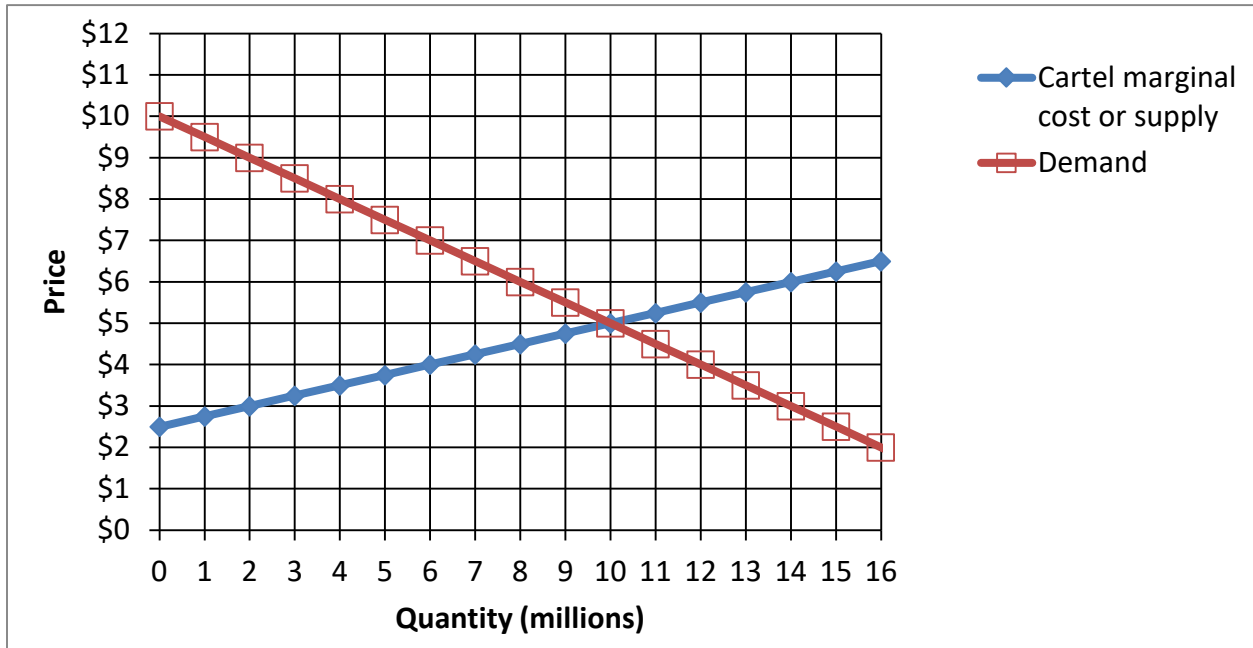
	thousand
\$	
\$	thousand
\$	thousand
\$	thousand

(4) [Monopoly price discrimination: 6 pts] Suppose the Drama Queen Theatre sells tickets to both children and adults. The theatre's manager believes the elasticity of demand by children is  $-4$ , and the elasticity of demand by adults is  $-2$ . Assume the theatre's marginal cost of providing a ticket is **\$15**.

- To maximize profit, which group should get the **lower** price?
- 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 detergent. 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?

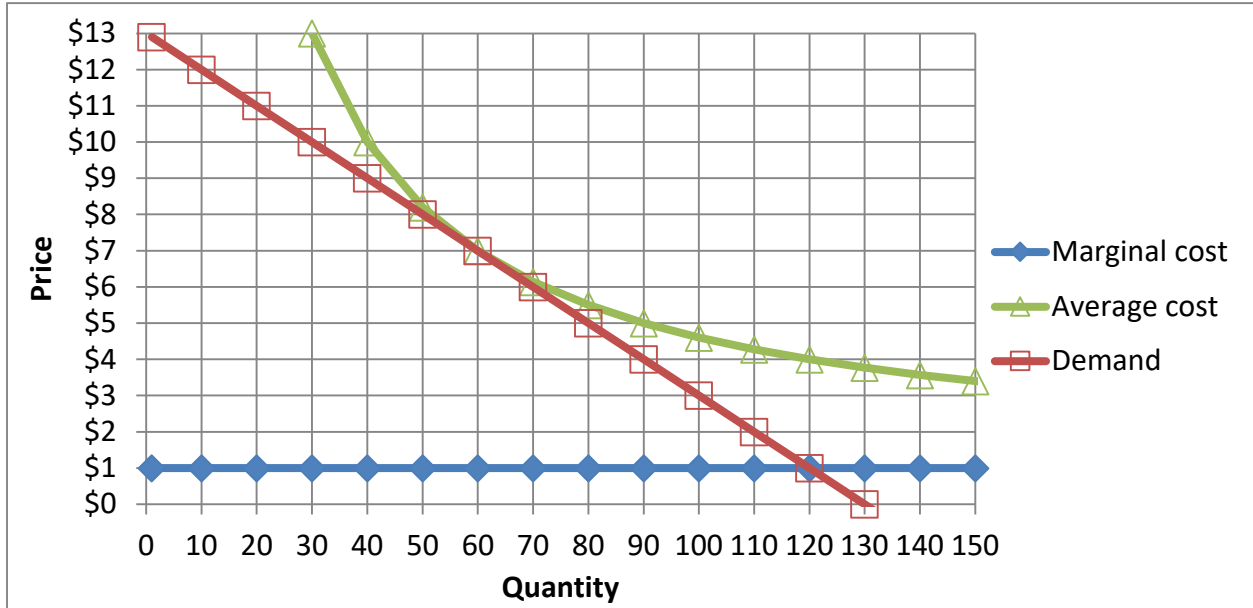
f. If output increased by one more unit at any firm, total costs would increase by how much?

g. What price will the firms jointly set?

h. Compute the social deadweight loss from collusion.

	million
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

(6) [Monopolistic competition: 18 pts] Curt sells sandwiches from a food truck downtown. The graph below shows his cost curves and demand curve.



a. Although there are many other food trucks downtown, Curt'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 Curt sets a price of **\$9**, for some unknown reason.

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

sandwiches
\$

Now suppose that Curt sets a price to maximize profit.

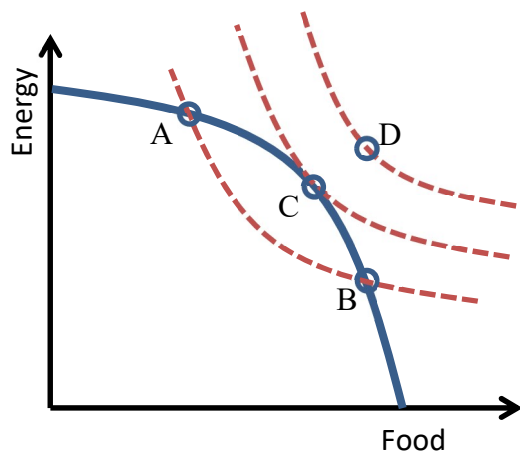
- e. *Using a straightedge*, draw and label Curt's marginal revenue curve.
- f. How many sandwiches will Curt sell?
- g. What price will Curt set?
- h. What is Curt's marginal cost?
- i. What is Curt's profit?

sandwiches
\$
\$
\$

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

- (1) The graph below 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, or D) 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? [Hint: How does monopoly affect the price and quantity of energy?]
  
- (2) The Des Moines Arts Festival features craft artists producing handmade jewelry, clothing, sculpture, etc. (Ignore the graph.)
  - 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. Are economic profits likely to equal zero 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]