

## EXAMINATION 1 “Review of Perfect Competition”

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, 12 pts total]

(1) Which of the following does *not* enforce antitrust policy in the United States?

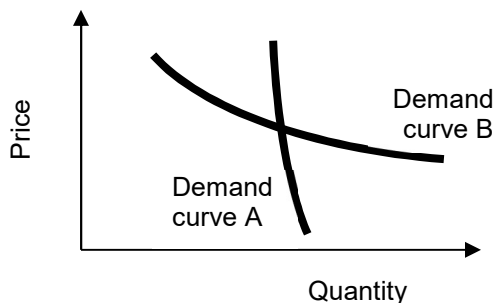
- a. Federal Trade Commission.
- b. Department of Commerce.
- c. Department of Justice.
- d. All of the above enforce antitrust policy.
- e. None of the above enforce antitrust policy.

(2) Excess demand in the housing market will cause the price of houses eventually to

- a. fall.
- b. rise.
- c. oscillate up and down.
- d. remain unchanged.

(3) Which demand curve below is *less* elastic?

- a. Demand curve A.
- b. Demand curve B.
- c. Both have the same elasticity because they pass through the same point.
- d. Cannot be determined from information given.



(4) All else equal, if a close substitute for a good exists, then the demand for the good will be

- a. more elastic.
- b. less elastic.
- c. perfectly inelastic.
- d. Existence of close substitutes does not affect the elasticity of demand.

(5) Compare the supply of grapes when producers are given one month to adjust to a new price, with the supply when producers are given five years to adjust to the new price.

- a. The one-month supply is more elastic.
- b. The five-year supply is more elastic.
- c. Time for adjustment does not affect elasticity.
- d. Cannot be determined from information given.

(6) “Economies of scale” mean that the firm’s average cost curve

- a. slopes up.
- b. slopes down.
- c. is horizontal.
- d. is vertical.

(7) United Manufacturing Company’s average cost is lower than marginal cost at its current level of output. Therefore, at its current level of output, its average cost curve

- a. slopes up.
- b. slopes down.
- c. is horizontal.
- d. is vertical

- (8) Acme Manufacturing discovers that its marginal cost is \$10, its average cost is \$3, and its marginal revenue is \$7. To increase its profit, Acme should
- a. increase output.
  - b. decrease output.
  - c. Acme cannot increase profit by changing its output level.
  - d. Cannot be determined from the information given.

- (9) In the short run, a firm should continue to operate only if its revenue is greater than its
- a. fixed cost.
  - b. variable cost.
  - c. total cost.
  - d. producer surplus.

- (10) Price equals average cost in
- a. short-run competitive equilibrium.
  - b. long-run competitive equilibrium.
  - c. both short-run and long-run competitive equilibrium.
  - d. none of the above.

- (11) If the market for electricity is perfectly competitive, and the price of electricity is \$35, then the marginal revenue for electricity producers is
- a. less than \$35.
  - b. exactly \$35.
  - c. more than \$35.
  - d. Cannot be determined from information given.

- (12) Suppose there is a change government policy affecting the airline industry. Which of the following outcomes would pass the compensation test of Kaldor and Hicks?
- a. Airlines gain \$5 billion while consumers are not affected.
  - b. Airlines gain \$10 billion while consumers lose \$5 billion.
  - c. Airlines gain \$5 billion while consumers lose \$10 billion.
  - d. Both (a) and (b).
  - e. All of the above.

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**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) [Using price elasticity of demand: 10 pts] Suppose the price elasticity of demand for potatoes is **-0.8**. Suppose potato growers cooperate to decrease output by 4%. Assume the demand curve does not shift.

- a. Is demand for this potatoes elastic, inelastic, or unitary-elastic?
- b. Will the price of potatoes *increase or decrease*?
- c. ... by about how much?
- d. Will revenue received by potato growers *increase or decrease*?
- e. ... by about how much?

%
%

(2) [Profit maximization: 10 pts] Suppose a firm's total revenue function is given by  $TR(q) = 8q$ , and its total cost function is given by  $TC(q) = 2q + (q^2/100)$ . Find the following, showing your work and circling your final answers.

a. Find the firm's marginal revenue function  $MR(q)$ .

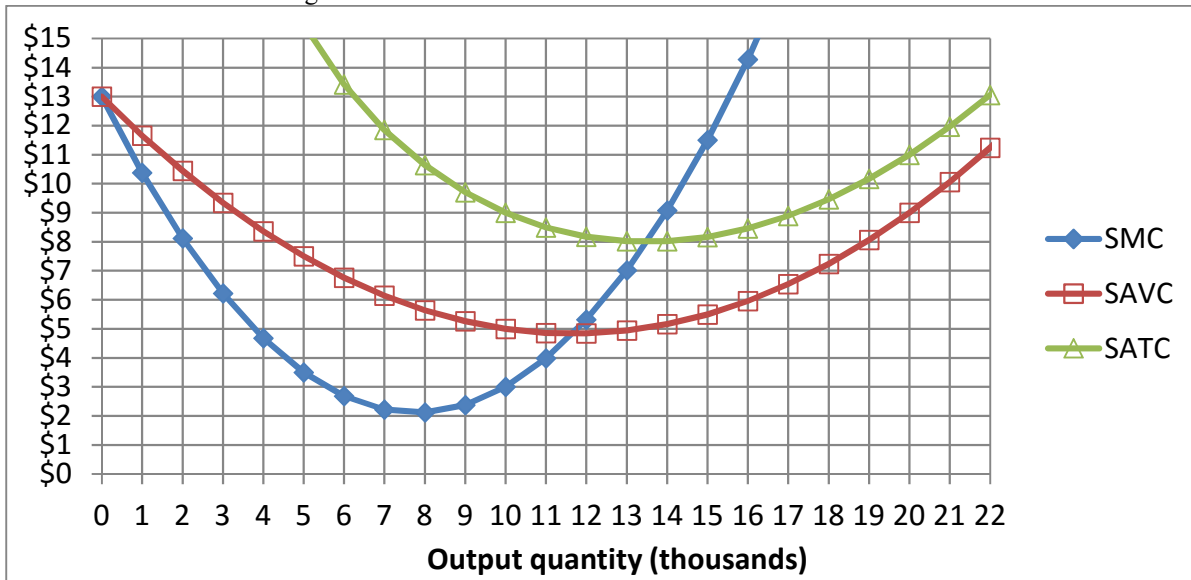
b. Does this firm take price as given? Why or why not?

c. Find the firm's marginal cost function  $MC(q)$ .

d. Compute the firm's profit-maximizing level of output  $q^*$ . Show your work and circle your final answer.

e. Compute the firm's total profit. Show your work and circle your final answer.

(3) [Short-run cost curves and supply: 24 pts] General Products Company is a small firm in a big market, and therefore takes its output price as given. In the short run, the company faces daily cost curves as shown in the following diagram. Here, SMC denotes short-run marginal cost, SAVC denotes short-run average variable cost, and SATC denotes short-run average total cost.



Suppose the company were currently producing 20 thousand units of output, for some unknown reason.

- a. Compute the company's short-run total cost, to the nearest thousand.
 

\$	thousand
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- b. Compute the company's short-run variable cost, to the nearest thousand.
 

\$	thousand
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- c. Compute the company's short-run fixed cost, to the nearest thousand.
 

\$	thousand
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Suppose the company were currently producing 2 thousand units of output, for some unknown reason.

- d. If the company produced one more unit, by how much would its total cost increase?  
 That is, what would be the *change in total cost* as the company increased output from 2000 to 2001 units? (Give an answer to the nearest dollar.)
 

\$	
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- e. What is the company's break-even price—that is, the lowest price at which the company can avoid losses?
 

\$	
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- f. What is the company's shut-down price—that is, the lowest price at which it will remain in operation in the short run?
 

\$	
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- g. Suppose the price of output is \$9. How many units will the company produce?
 

	thousand
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- h. Will the company make a *profit* or a *loss* at a price of \$9, or will it *break even*?
 

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- i. Suppose the price of output is \$3. How many units will the company produce?
 

	thousand
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- j. Will the company make a *profit* or a *loss* at a price of \$3, or will it *break even*?
 

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- k. Suppose the price of output is \$7. How many units will the company produce?
 

	thousand
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- l. Will the company make a *profit* or a *loss* at a price of \$7, or will it *break even*?
 

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(4) [Long-run cost and supply: 10 pts] [Long-run cost and supply] Suppose Tip-Top Manufacturing Company has the following long-run cost function:

$$TC(q) = 0.01 q^3 - q^2 + 35 q$$

a. Find an expression for the company's marginal cost function.

MC(q) =
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b. Find an expression for the company's average cost function.

AC(q) =
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c. Compute the company's efficient scale  $q_{ES}$ . Show your work and circle your final answer.

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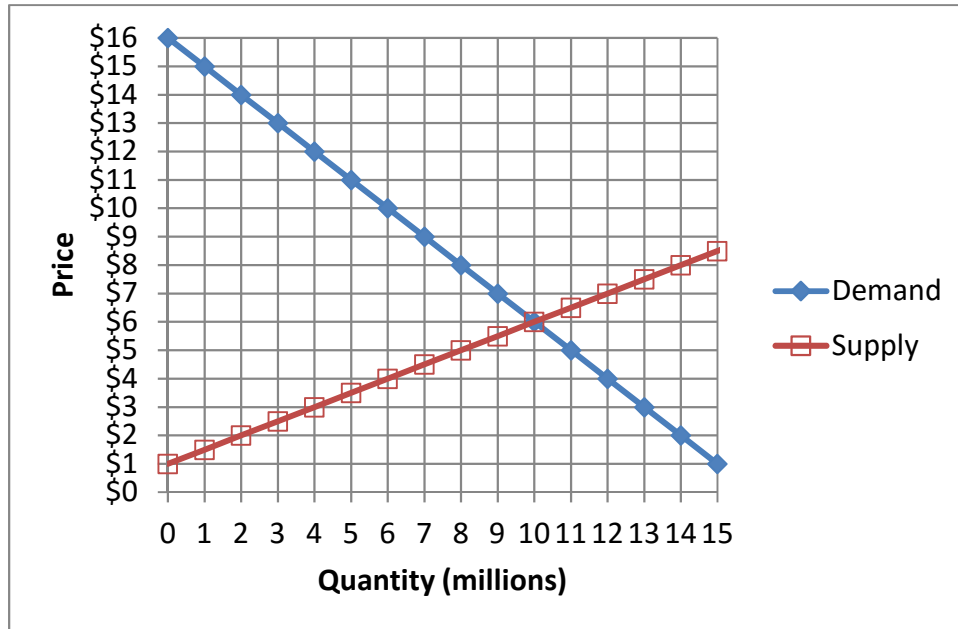
d. Compute the company's breakeven price—the minimum price at which it can avoid losses. Show your work and circle your final answer.

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e. Suppose all firms in this industry have these same costs. If the market price is **\$8**, will new firms try to *enter* the industry, or will existing firms try to *exit* the industry? Why?

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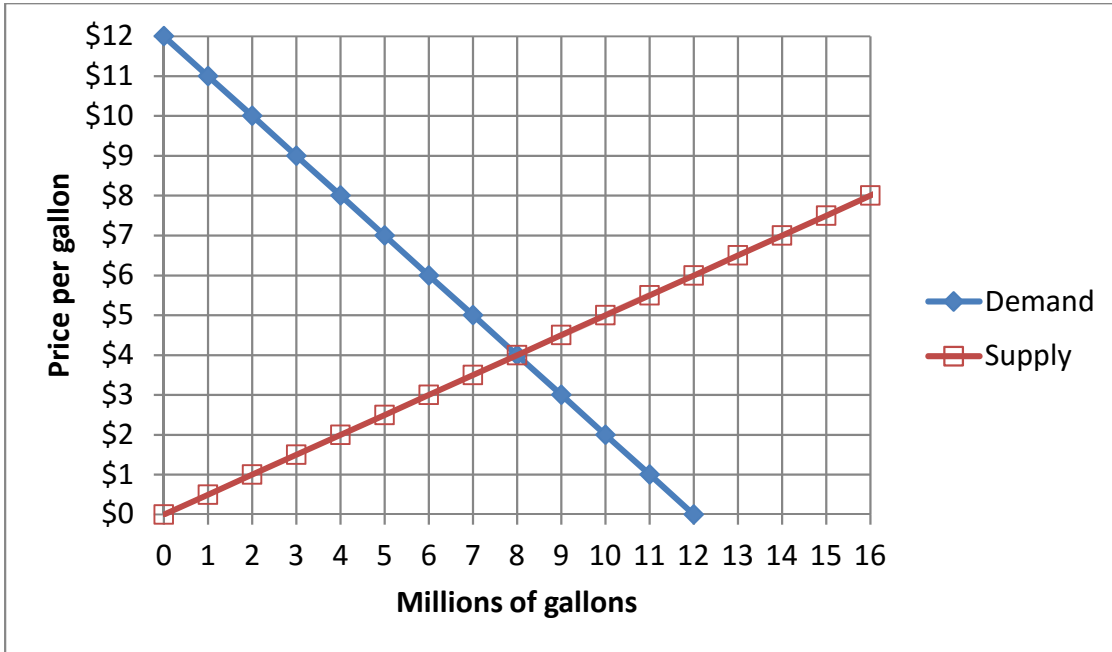
(5) [Consumer surplus, producer surplus: 12 pts] The market for vitamins is depicted in the graph below. Assume the market is in competitive equilibrium.



- How much are consumers willing to pay for the 3 millionth bottle of vitamins?
- How much consumer surplus do they enjoy for the 3 millionth bottle of vitamins?
- What is the marginal cost to producers of the 6 millionth bottle of vitamins?
- How much producer surplus do they enjoy for the 6 millionth bottle of vitamins?
- Compute total consumer surplus.
- Compute total producer surplus.

\$	
\$	
\$	
\$	
\$	million
\$	million

(6) [Welfare analysis of price controls: 18 pts] The following graph shows the market for milk.



a. Find the equilibrium price without government intervention.

\$
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Suppose the government imposes a price floor (or legal minimum price) of \$ 6 per gallon. No milk may be sold for a price less than the price ceiling.

b. How many gallons of milk will actually be sold?

million gallons
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c. Will there be *excess demand*, *excess supply*, or *neither*?

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d. How much?

million gallons
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e. Does producer surplus *increase*, *decrease*, or *remain constant* because of the price floor, as compared to the market without government intervention? (Assume optimistically that milk is sold by those producers with the lowest costs.)

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f. By how much?

\$	million
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g. Does consumer surplus *increase*, *decrease*, or *remain constant* because of the price floor, as compared to the market without government intervention?

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h. By how much?

\$	million
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i. Compute the deadweight social loss caused by the price floor.

\$	million
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**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) Suppose the elasticity of demand in some industry is  $-0.5$ . If output increases, but the demand curve does not shift, will firms' total revenue *increase* or *decrease*? Justify your answer.
- (2) A firm that takes price as given does not believe its output level will affect the market price. Give an example of a company and that you believe takes price as given and explain why. Give an example of another company that you believe does *not* take price as given and explain why.

[end of exam]