

EXAMINATION 3 VERSION C
"Choices Underlying Supply and Demand"
April 9, 2014

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators or calculators with alphabetical keyboards 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.

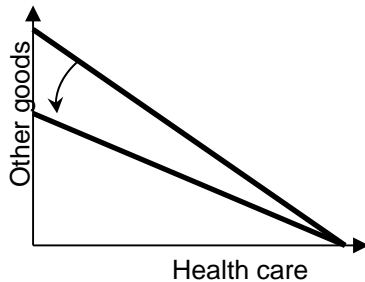
I. Multiple choice: Please circle the one best answer to each question. [1 pts each, 12 pts total]

(1) A change in the amount of bottled water each person buys is called a change at the

- a. extensive margin.
- b. intensive margin.
- c. marginal product.
- d. marginal revenue.

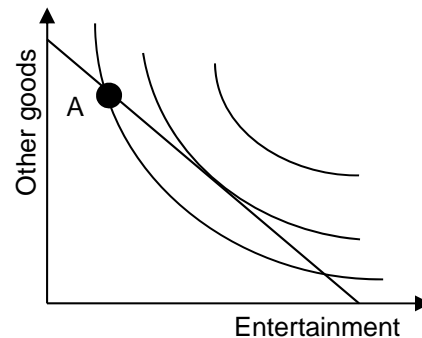
(2) In the graph below, the rotation of the budget line could be caused by

- a. an increase in income.
- b. a decrease in income.
- c. an increase in the price of health care.
- d. a decrease in the price of health care.
- e. an increase in the price of other goods.
- f. a decrease in the price of other goods.



(3) Adele's indifference-curve diagram is shown below. The straight line represents Adele's budget line and the curved lines represent her indifference curves. If Adele is now at point A, she could be made better off without exceeding her budget by

- a. buying more other goods and less entertainment.
- b. buying more entertainment and fewer other goods.
- c. either (a) or (b).
- d. Adele cannot be made better off by changing her purchases.



(4) Suppose the price of gasoline is \$3 per gallon and Bob's income is \$300. Then Bob will buy

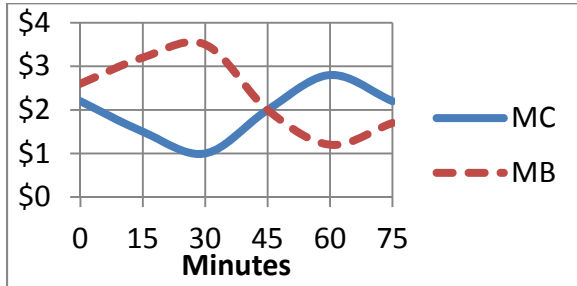
- a. 3 gallons of gasoline.
- b. 100 gallons of gasoline.
- c. Answer depends on the price of other goods.
- d. Answer depends on Bob's indifference curves.
- e. Both (c) and (d).

(5) The price of tee-shirts is approximately equal to

- a. the value to the consumer of the last tee-shirt that a consumer buys.
- b. the value to the consumer of the first tee-shirt that a consumer buys.
- c. the average value to the consumer of all tee-shirts that a consumer buys.
- d. zero.

(6) The graph below shows Caitlin's marginal cost (MC) and marginal benefit (MB) from exercise. If Caitlin is rational, she will choose to exercise

- a. 0 minutes.
- b. 15 minutes.
- c. 30 minutes.
- d. 45 minutes.
- e. 60 minutes



(7) At its current level of output, ABC Company's average cost is \$10, its marginal cost is \$7, and its marginal revenue is \$15. If ABC produces and sells one more unit of output, its profit will

- a. increase by \$3.
- b. increase by \$5.
- c. increase by \$8.
- d. increase by \$15.
- e. remain constant.

(8) In the short run, which kind of cost does *not* depend on the level of output?

- a. Total cost.
- b. Fixed cost.
- c. Variable cost.
- d. Marginal cost

(9) In the *short run*, a firm should shut down if its revenue is insufficient to pay even its

- a. accounting cost.
- b. fixed cost.
- c. variable cost.
- d. total cost.

(10) The formula for discounting shows that the present discounted value of a payment to be received in the future is *smaller*,

- a. the lower the interest rate (or discount rate).
- b. the longer the wait until the payment is received.
- c. Both (a) and (b).
- d. Neither (a) nor (b).

(11) Firms are currently entering the tablet industry because in so doing they hope to

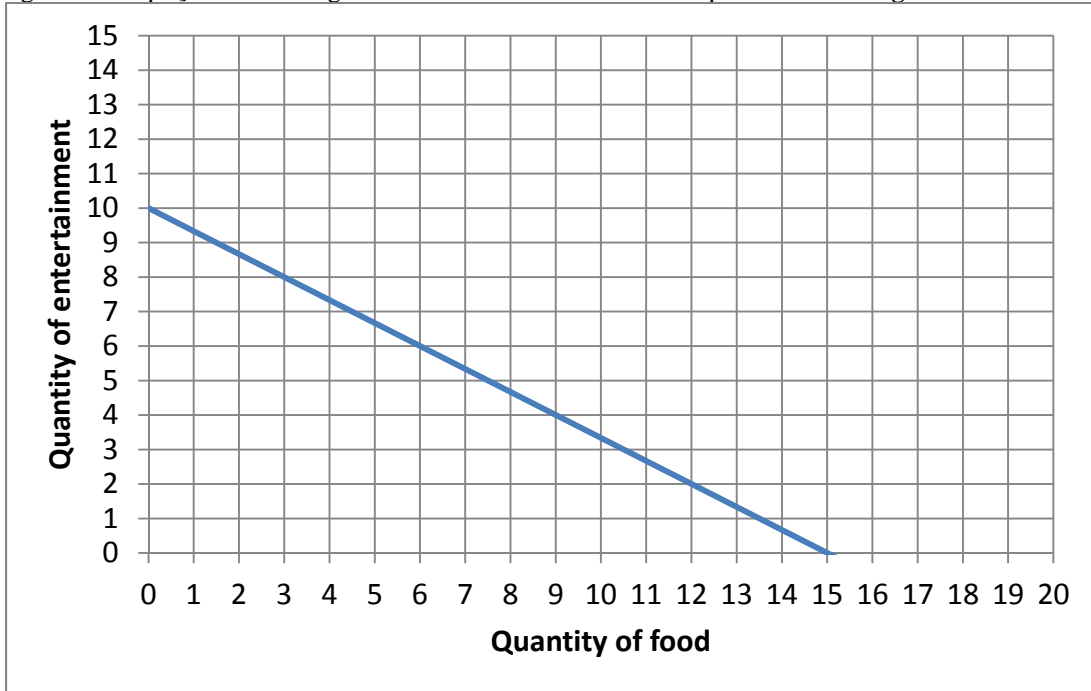
- a. lower the market price.
- b. lower the profits of existing tablet producers.
- c. enjoy economic profits.
- d. increase the total quantity produced in the market.
- e. All of the above.

(12) Suppose the market for flash drives is competitive market and is in *long-run* equilibrium. Assume all firms have the same cost curves. Then price equals

- a. marginal cost of every firm in the industry.
- b. average cost of every firm in the industry.
- c. both (a) and (b).
- d. neither (a) nor (b), necessarily.

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) [Budget line: 14 pts] Adam's budget for food and entertainment is depicted in the **budget line** below.



Determine whether the following combinations of goods are *exactly affordable*, *affordable with money left over*, or *not affordable* for Adam.

- a. 9 units of entertainment and 4 units of food.
- b. 4 units of entertainment and 9 units of food.
- c. 1 unit of entertainment and 12 units of food.

Assume that Adam spends all his income on food and entertainment.

- d. What is Adam's opportunity cost of a unit of food?
- e. Adam's indifference curves are not shown in this graph. Nevertheless, we know that at Adam's best-choice combination, his marginal rate of substitution of food for entertainment (that is, the slope of his indifference curve) must equal ...

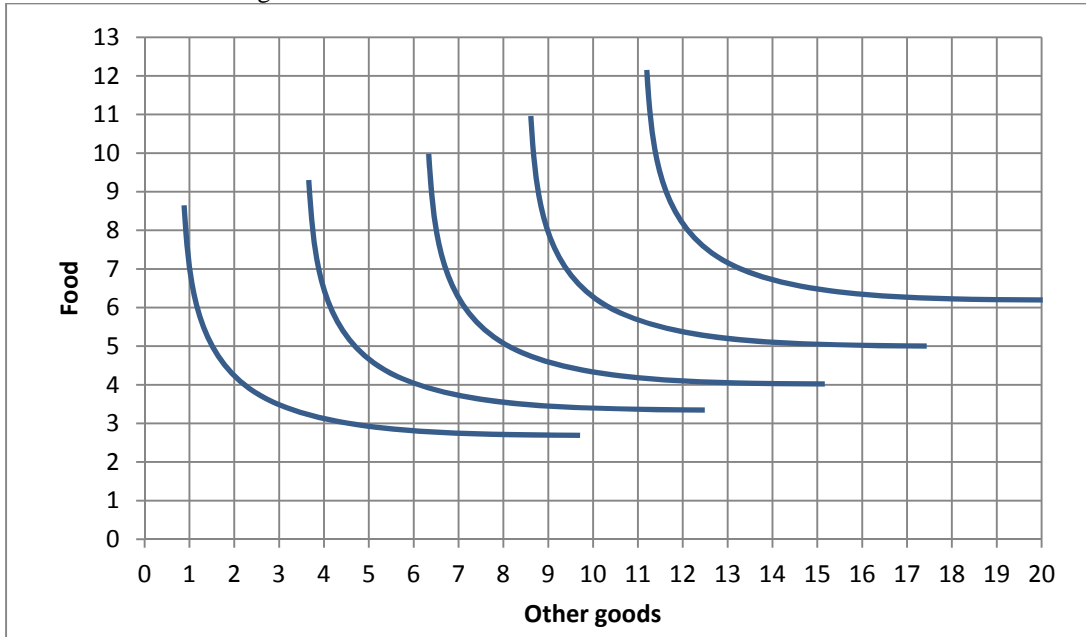
units of entertainment

Assume that Adam's income is **\$ 60**.

- f. What must be the price of entertainment?
- g. What must be the price of food?

\$
\$

(2) [Consumer choice and demand: 14 pts] The indifference curves in the graph below represent Brittany's preferences for food and other goods.



- a. Would Brittany rather have 5 units of food and 17 units of other goods, or 8 units of food and 12 units of other goods?
- b. Would Brittany rather have 8 units of food and 1 unit of other goods, or 4 units of food and 6 units of other goods?

units of food and	units of other goods
units of food and	units of other goods

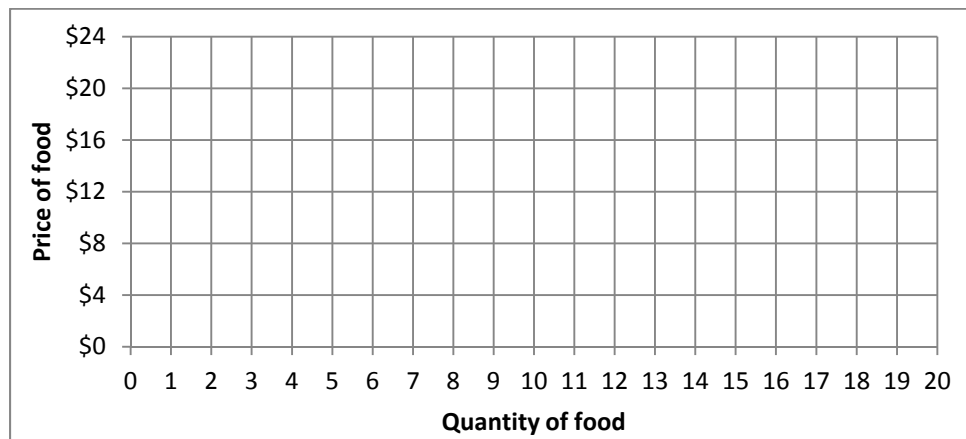
Suppose Brittany has a budget of \$80 to spend on food and other goods. The price of other goods is \$5.

- c. **Using a straightedge**, carefully draw Brittany's budget line when the price of food is \$8. Label this budget line "A".
- d. How much food will Brittany buy if the price of food is \$8?
- e. **Using a straightedge**, carefully draw Brittany's budget line when the price of food is \$20. Label this budget line "B".
- f. How much food will Brittany buy if the price of food is \$20?

	units of food
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	units of food
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- g. Plot two points on Brittany's demand curve for food, and sketch her demand curve at right.



(3) [Rational choice: 10 pts] The state government is considering building a bridge. The following are cost and benefit estimates for bridges of different sizes.

Lanes	Total cost	Total benefit	Marginal cost per lane	Marginal benefit per lane
0	\$ 0	\$0		
			\$ million	\$ million
2	\$20 million	\$40 million		
			\$ million	\$ million
4	\$34 million	\$58 million		
			\$ million	\$ million
6	\$50 million	\$64 million		
			\$ million	\$ million
8	\$68 million	\$70 million		

- a. [4 pts] Compute the marginal cost schedule. Insert your answers above.
- b. [4 pts] Compute the marginal benefit schedule. Insert your answers above.
- c. [2 pts] How many lanes should the bridge have? (Answer must be 0, 2, 4, 6, or 8.)

lanes

(4) [Basic definitions, cost and revenue: 3 pts] Insert the appropriate term from the list below in each box. The same term may be entered in more than one box.

Total revenue
Total cost

Average revenue
Average cost

Marginal revenue
Marginal cost

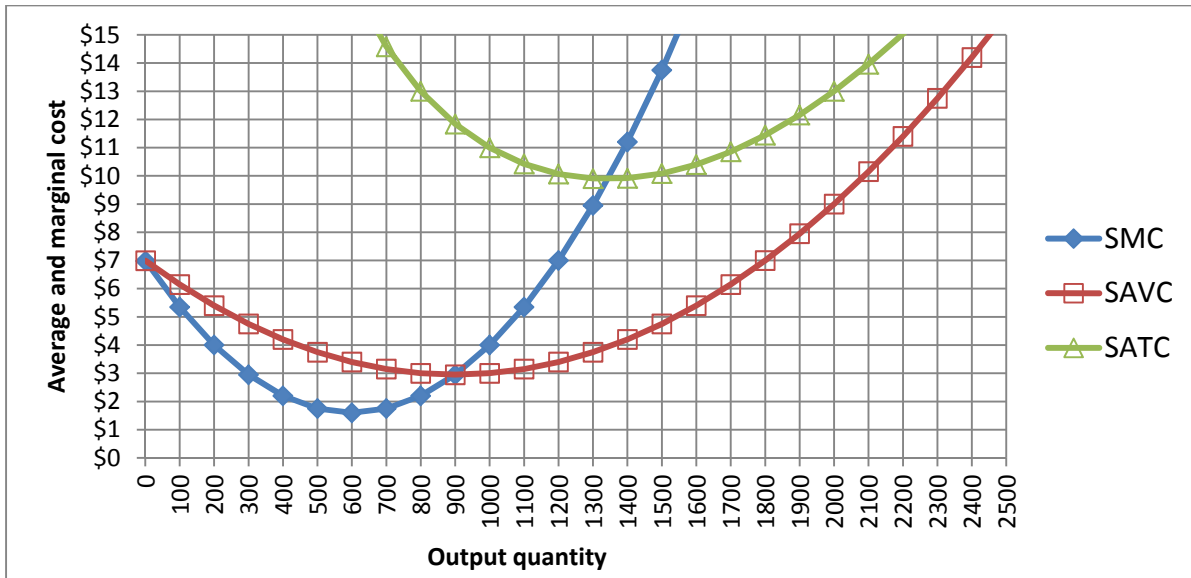
- a. Change in total revenue divided by change in output.
- b. All money paid for inputs purchased or hired.
- c. Increase in total cost from producing another unit of output.

(5) [Discounting: 4 pts] Answer the following questions, assuming the interest rate is **8 %**.

- a. Suppose a particular project will *cost* a firm \$5000 today, but will bring \$2000 in revenue a year from today, and \$4000 in revenue two years from today. Compute the *net present value* of this project to the nearest whole dollar.
- b. Suppose a firm is expected to enjoy \$12 million in profit every year, perpetually, beginning a year from today. Compute the value of the firm.

\$	
\$	million

(6) [Short-run cost curves and supply: 16 pts] Fritz Electronics makes electronic parts. It is a small company 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.



a. What is this company's *shutdown price*?

\$

b. What is this company's *breakeven price*?

\$

Suppose the market price is **\$4**. Assume the company maximizes profit.

b. How many parts will the company produce? (Give an answer to the nearest hundred.)

	parts
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c. Compute the company's short-run total cost. (Round to the nearest hundred dollars.)

\$

d. Compute the company's short-run variable cost. (Round to the nearest hundred dollars.)

\$

e. Compute the company's short-run fixed cost. (Round to the nearest hundred dollars.)

\$

f. Compute the company's revenue. (Round to the nearest hundred dollars.)

\$

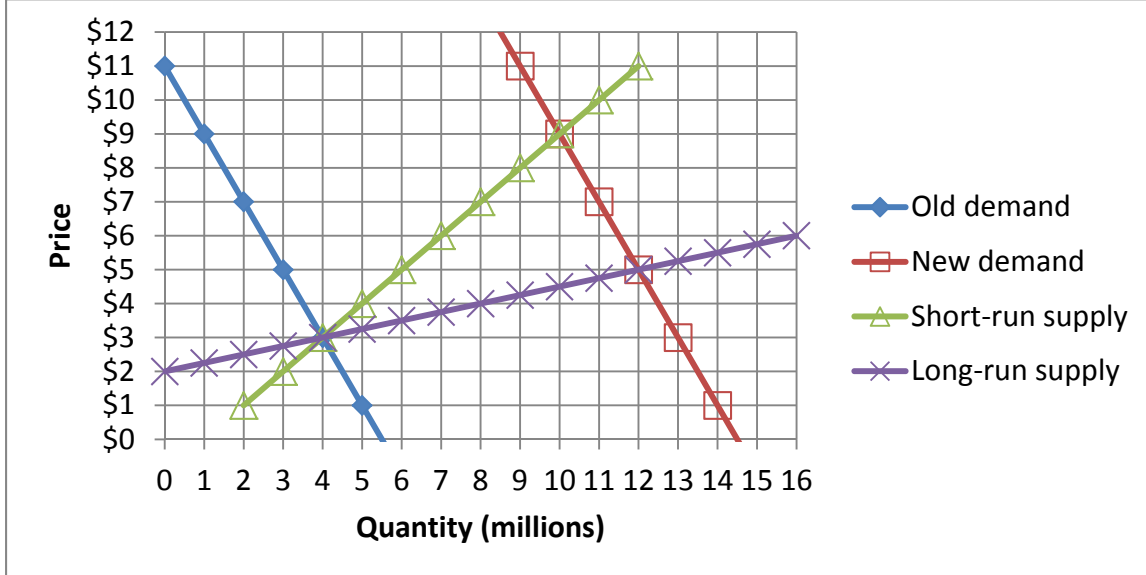
g. Will the company have a *profit*, a *loss*, or will it *break even*?

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h. Compute the company's profit or loss. (Round to the nearest hundred dollars.)

\$

(7) [Long-run competitive equilibrium: 24 pts] The graph below shows the market for artichokes, which is competitive.



Initially the market is in long-run equilibrium, with the demand curve given by “old demand” and the short-run supply curve given by “short-run supply” as shown in the graph.

- What is the initial equilibrium price?
- What is the initial equilibrium quantity?
- What is the average cost of production for firms in this industry?

\$
million
\$

Suppose that a scientific study claims that eating artichokes makes people live longer, and the demand shifts to “new demand.” Consider the **short-run** market response to this demand shift.

- What is the new equilibrium price in the short run?
- What is the new equilibrium quantity in the short run?
- Are artichoke producers now making economic *profits*, *losses*, or just *breaking even*?

\$
million

Now, consider the **long-run** market response to this demand shift.

- Given your answer to (f) above, will existing firms try to *exit* the industry or will new firms try to *enter* the industry?
- What is the new equilibrium price in the long run?
- What is the new equilibrium quantity in the long run?
- What is the new long-run average cost of production for firms in this industry?
- Has the number of firms in this industry *increased*, *decreased*, or remained *constant*?
- Should this industry be called a *constant-cost* industry, an *increasing-cost* industry, or a *decreasing-cost* industry?

\$
million
\$

III. Critical thinking: Write a one-paragraph essay answering one question below (your choice). [3 pts]

- (1) Suppose you are shopping for a new computer. You find a good one at Store A for \$500. You pay a nonrefundable deposit of \$200, expecting to pay the balance of \$300 and pick up your computer next week. Then you discover that Store B will sell you the same computer for \$350. Will you buy your computer from Store A or Store B? Justify your answer, identifying any sunk cost(s).
- (2) You operate a house-painting business in a competitive market, where everyone charges about \$1000 for an average-size house. You know that you can get all the business you can handle if you just put up a few signs. You review your costs last year in order to decide what to do this year. You discover that last year, your average cost per house was about \$800, and your marginal cost per house was about \$1200. So this year, should you expand your business (paint more houses), downsize it (paint fewer houses), or neither (paint the same number of houses)? Justify your answer.

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]