

**EXAMINATION 3 VERSION B**  
**"Choices Underlying Supply and Demand"**  
**April 10, 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. Point values for each question are noted in brackets. Maximum total points are 100.

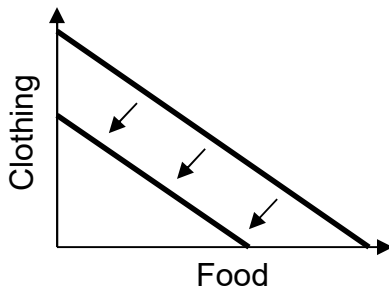
**I. Multiple choice:** Please circle the one best answer to each question. [1 pt each, 14 pts total]

(1) A change in the quantity of organic vegetables that 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 shift in the budget line could be caused by

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

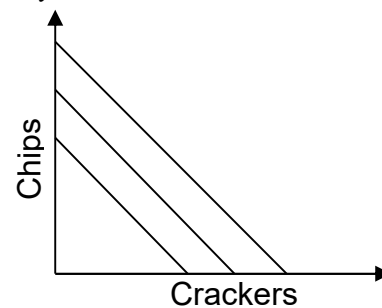


(3) Indifference curves show how different bundles of goods compare with each other with respect to

- a. weight.
- b. size.
- c. cost to the consumer.
- d. the consumer's preference.

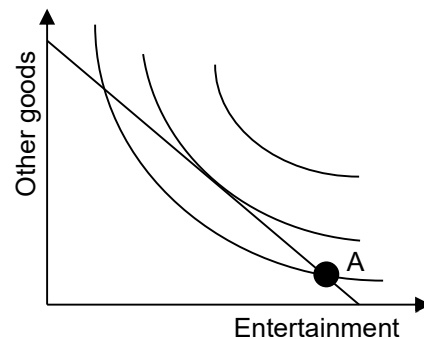
(4) The indifference-curve graph below shows Beth's preferences. The graph reveals that, for Beth, chips and crackers are

- a. perfect squares.
- b. perfect substitutes.
- c. perfect complements.
- d. perfectly elastic.



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

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



- (6) Accounting costs do *not* usually include such economic costs as
- the opportunity cost of the business owner's time spent running the business.
  - wages paid to workers.
  - money paid for electricity, raw materials, and supplies.
  - lease payments.

- (7) The increase in cost caused by the last unit of a firm's output is called the firm's
- total cost.
  - average cost.
  - marginal cost.
  - total revenue.
  - average revenue.
  - marginal revenue.

- (8) All money paid by a firm for inputs equals by definition the firm's
- total cost.
  - average cost.
  - marginal cost.
  - total revenue.
  - average revenue.
  - marginal revenue.

- (9) The slope of a firm's total revenue curve by definition equals the firm's
- total cost.
  - average cost.
  - marginal cost.
  - total revenue.
  - average revenue.
  - marginal revenue.

- (10) A firm's total cost divided by its total output by definition equals the firm's
- total cost.
  - average cost.
  - marginal cost.
  - total revenue.
  - average revenue.
  - marginal revenue.

- (11) At its current level of output, ABC Company's marginal cost is \$7, its average cost is \$10, and its marginal revenue is \$15. If ABC produces and sells one more unit of output, its profit will
- increase by \$3.
  - increase by \$5.
  - increase by \$8.
  - increase by \$15.
  - remain constant.

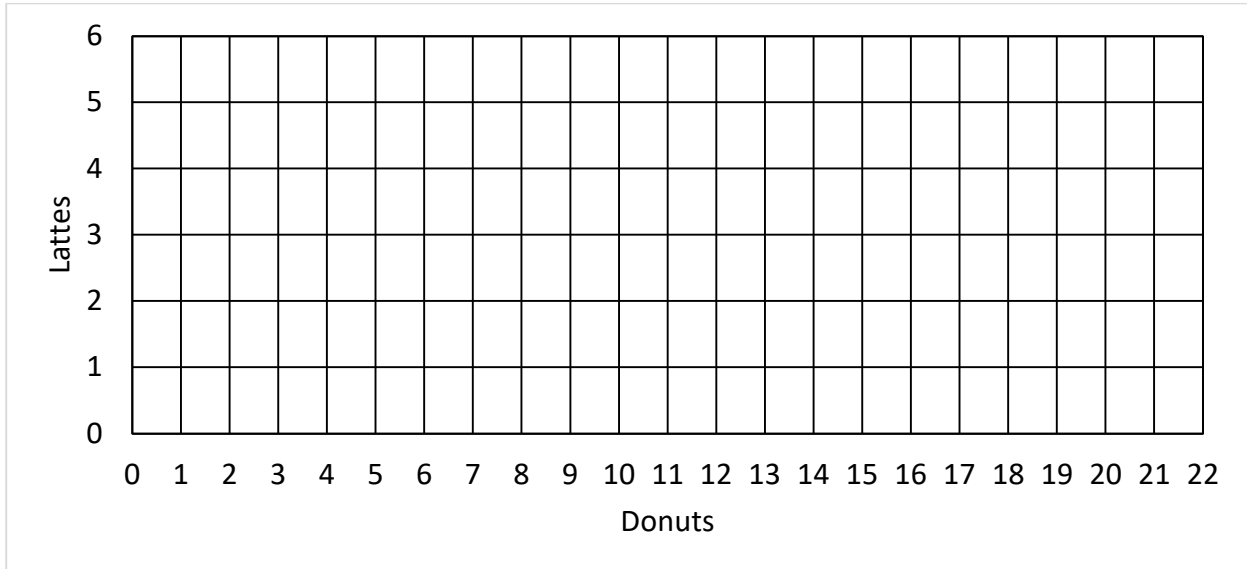
- (12) In the *short run*, a firm should continue operating if its revenue is sufficient to pay at least its
- total cost.
  - accounting cost.
  - fixed cost.
  - variable cost.

- (13) The formula for discounting shows that the present discounted value of \$100 to be received in the future is *smaller*
- the shorter the wait until the payment is received.
  - the longer the wait until the payment is received.
  - Present discounted value is not affected by the time until payment.
  - Cannot be determined from the information given.

- (14) *Price equals marginal cost* in a competitive industry in both short-run and long-run equilibrium because
- business owners have a sense of fairness.
  - individual firms adjust their output levels to maximize profit.
  - consumers refuse to pay more than what is reasonable.
  - positive profits encourage entry of new firms while negative profits encourage existing firms to leave the industry.
  - the threat of government regulation causes firms to hold prices down.

**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) [Consumer’s budget constraint: 10 pts] Abe has **\$30** to spend on donuts and lattes. The price of lattes is **\$6**. The price of donuts is **\$2**.



a. **Using a straightedge**, carefully draw Abe’s budget line

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

b. 3 lattes and 6 donuts.

c. 2 latte and 11 donuts.

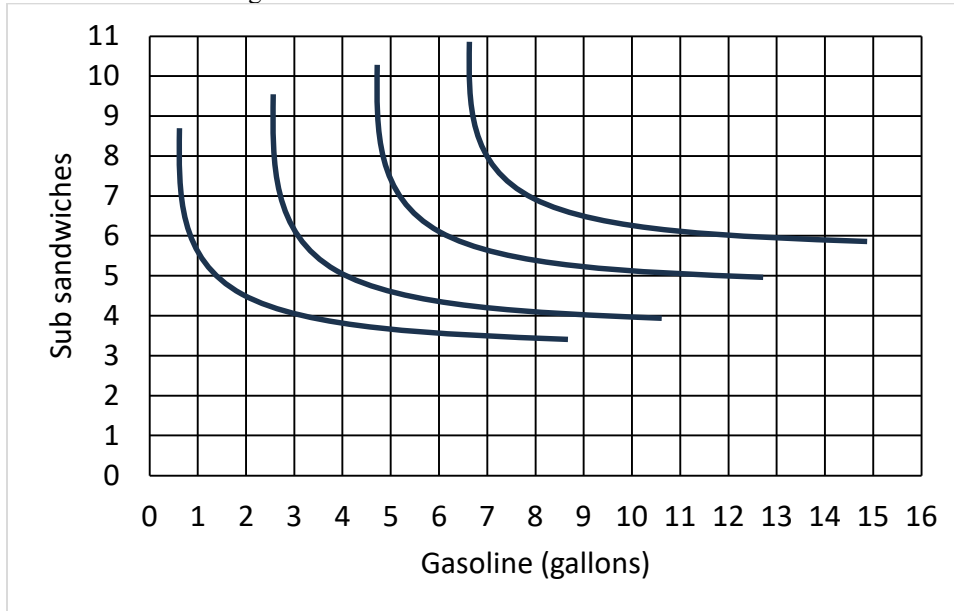
d. 4 lattes and 2 donuts.


Assume that Abe spends all his income on donuts and lattes.

e. What is Abe’s opportunity cost of a donut?

lattes
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(2) [Consumer choice and demand: 14 pts] The indifference curves in the graph below represent Brittany's preferences for sub sandwiches and gasoline.



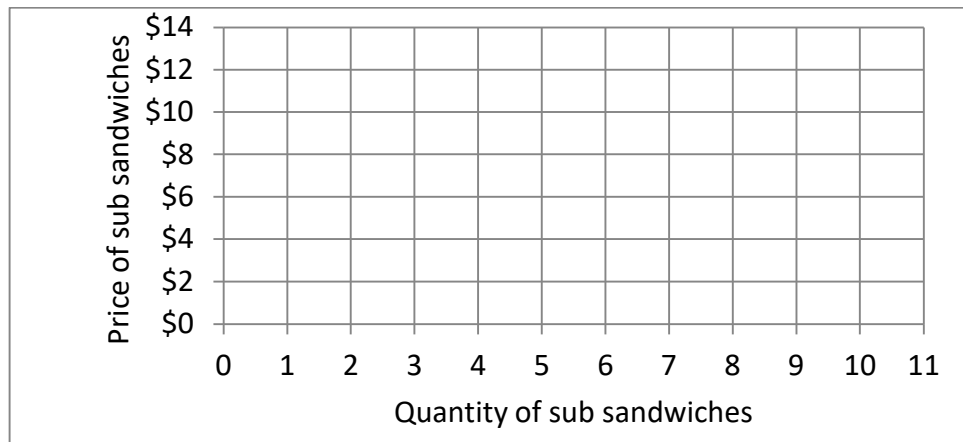
- a. Would Brittany rather have 8 sub sandwiches and 7 gallons of gasoline, or 5 sub sandwiches and 11 gallons of gasoline?
- b. Would Brittany rather have 6 sub sandwiches and 6 gallons of gasoline, or 4 sub sandwiches and 9 gallons of gasoline?

sub sandwiches and	gallons of gasoline .
sub sandwiches and	gallons of gasoline .

Suppose Brittany has a budget of \$60 to spend on sub sandwiches and gasoline. The price of gasoline is \$4.

- c. **Using a straightedge**, carefully draw Brittany's budget line when the price of sub sandwiches is \$6. Label this budget line "A".
- d. How many sub sandwiches will Brittany buy if the price of sub sandwiches is \$6?   sandwiches
- e. **Using a straightedge**, carefully draw Brittany's budget line when the price of sub sandwiches is \$12. Label this budget line "B".
- f. How many sub sandwiches will Brittany buy if the price of sub sandwiches is \$12?   sandwiches

- g. Plot two points on Brittany's demand curve for sub sandwiches, and sketch her demand curve at right.



(3) [Rational choice: 10 pts] The Parks Department is deciding how long to keep the city pool open. The following are cost and benefit estimates for different pool hours.

Hours	Total cost	Total benefit	Marginal cost per hour	Marginal benefit per hour
0	\$ 0	\$0		
			\$	\$
4	\$100	\$200		
			\$	\$
8	\$180	\$400		
			\$	\$
12	\$280	\$460		
			\$	\$
16	\$400	\$500		

- 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 hours should the pool remain open? (Answer must be 0, 4, 8, 12, or 16 hours.)

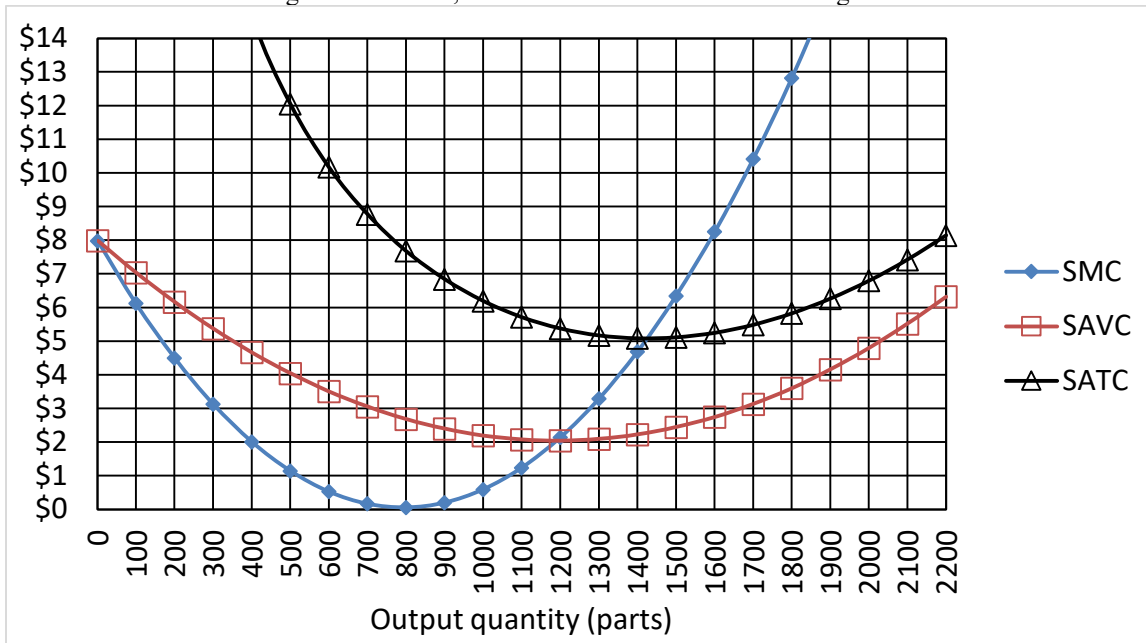
hours
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(4) [Discounting: 4 pts] Answer the following questions, assuming the interest rate is **10%**.

- a. Suppose a particular project will *cost* a firm \$1000 today, but will bring \$600 in revenue a year from today, and \$500 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 \$10 million in profit every year, perpetually, beginning a year from today. Compute the value of the firm.

\$	
\$	million

(5) [Short-run cost curves and supply: 20 pts] Micro Manufacturing Company makes a small part used in mobile phones. Micro 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.



Suppose the company were currently producing 500 parts for some unknown reason.

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

\$	thousand
\$	thousand
\$	thousand

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

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

d. Suppose the company were currently producing 300 parts for some unknown reason. If the company produced one more part, by how much would its total cost increase? That is, what would be the *change in total cost* as the company increased output from 300 to 301 parts? (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? (Give an answer to the nearest dollar.)

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? (Give an answer to the nearest dollar.)

g. Suppose the price of parts is \$3. How many parts should the company produce? (Give an answer to the nearest hundred.)

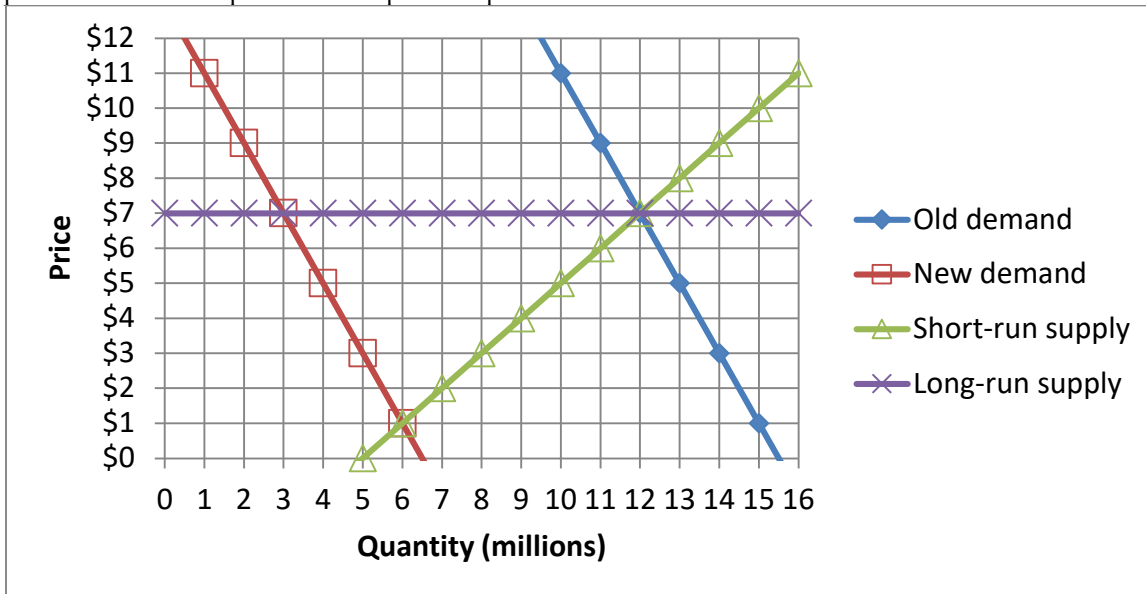
h. Will the company make a *profit* or a *loss* at a price of \$3?

i. Suppose the price of parts is \$8. How many parts should the company produce? (Give an answer to the nearest hundred.)

j. Will the company make a *profit* or a *loss* at a price of \$8?

\$
\$
parts
parts

(6) [Long-run competitive equilibrium: 24 pts] The graph below shows the market for musk melons, which is competitive. Assume all producers and potential producers have the same costs as each other.



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.

a. What is the initial equilibrium price?

\$
million
\$

b. What is the initial equilibrium quantity?

c. What is the average cost of production for producers in this industry?

Suppose that a government report says that eating musk melons causes acne, and the demand shifts to “new demand.” Consider the **short-run** market response to this demand shift.

d. What is the new equilibrium price in the short run?

e. What is the new equilibrium quantity in the short run?

f. Are producers in this market making economic *profits*, *losses*, or just *breaking even*?

\$
million

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

g. Given your answer to (f) above, will existing producers try to *exit* the market or will new producers try to *enter* the market?

h. What is the new equilibrium price in the long run?

i. What is the new equilibrium quantity in the long run?

j. What is the new long-run average cost of production for producers in this market?

k. Has the number of producers in this market *increased*, *decreased*, or remained *constant*?

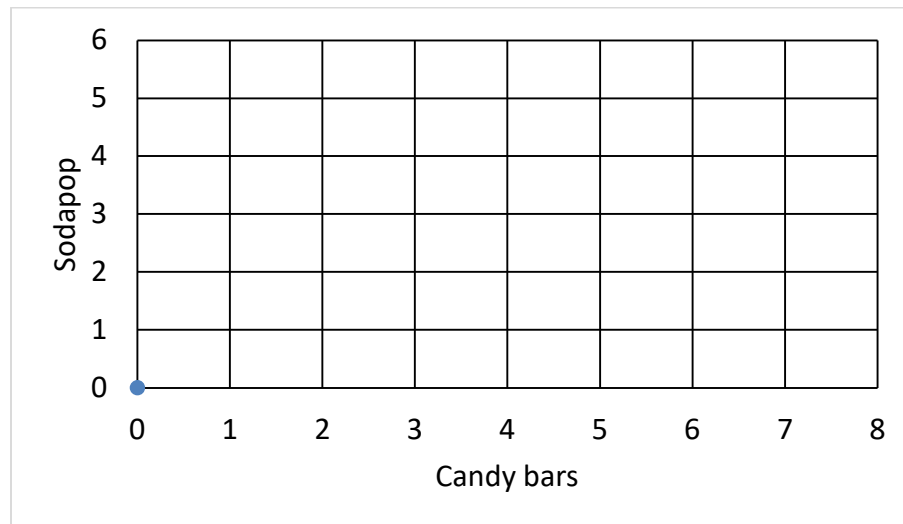
l. Should this industry be called a *constant-cost* industry, an *increasing-cost* industry, or a *decreasing-cost* industry?

\$
million
\$

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

- (1) Sam has \$5 to spend on sodapop and candy bars. The price of sodapop is \$1 per can. The price of candy bars is \$1 each for the first three candy bars. However, the store offers a discount on candy bars after the first three: the price of additional candy bars is only \$0.50 each. Using a straightedge, carefully draw Sam's budget constraint in the graph below, circling and labeling any kink points. (A kink point is a point where the slope of a curve changes abruptly.) Explain your reasoning in words.
- (2) Firm A is one of dozens of companies that make spark plugs. Firm B is the only seller of a certain kind of computer software. Which firm is more likely to take the price of its product as given? Why? (Ignore the graph).

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]