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EXAMINATION 3 VERSION B
"Choices Underlying Supply and Demand"
November 7, 2022

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 write your name and "Version B" on your answer sheet. Then mark the one best answer to each question on the answer sheet. [1 pt each, 28 pts total]

(1) A change in the number of people who buy organic vegetables is called a change at the
a.   extensive margin.
b.   intensive margin.
c.   marginal product.
d.   marginal revenue.

(2) Suppose Anna has an income of $100 to spend on food and other goods. Suppose food costs $5 and other goods cost $10. Then a bundle consisting of 12 units of food and 7 units of other goods would be
a.   on Anna's budget line.
b.   inside Anna's budget line.
c.   outside Anna's budget line.
d.   Cannot be determined from information given.

(3) The price of orange juice is $1.50 per can. The price of milk is $3 per gallon. Amy's income is $60. Amy's opportunity cost of a can of orange juice is
a.   1/2 gallon of milk.
b.   1 gallon of milk.
c.   1.5 gallons of milk.
d.   2 gallons of milk.
e.   3 gallons of milk.

(4) 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.
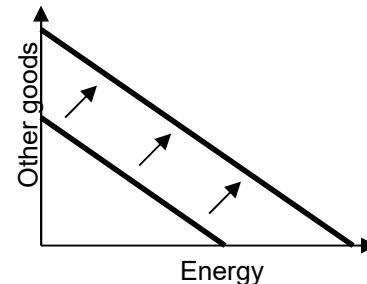
(5) If two bundles are on the same indifference curve, then they
a.   are equally affordable.
b.   cost the same amount.
c.   are equally preferred by the consumer.
d.   include identical amounts of all goods.

(6) The shape and position of a person's indifference curves depend on
a.   the prices the person faces in the market.
b.   the person's preferences for different bundles.
c.   the person's income.
d.   all of the above.

(7) 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.
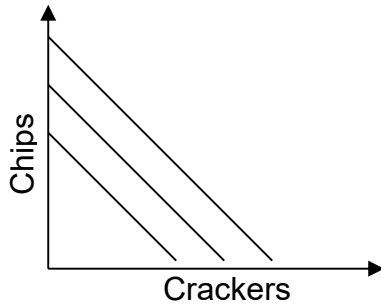
(8) Carl's indifference-curve diagram is shown below. The straight line represents Carl's budget line and the curved lines represent his indifference curves. If Carl is now at point A, he could be made better off without exceeding his budget by
a.   buying more other goods and less entertainment.
b.   buying more entertainment and fewer other goods.
c.   either (a) or (b).
d.   Carl cannot be made better off by changing his purchases.
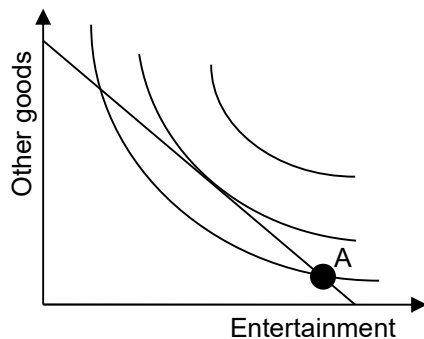
(9) The Springfield City Swimming Pool is now open 10 hours a day. Suppose a study shows that the marginal benefit of keeping the pool open is $40 per hour, and the marginal cost is $60. If these numbers are accurate, then Springfield would be better off
a.   keeping the City Pool open more hours.
b.   keeping the City Pool open fewer hours.
c.   making no change in the City Pool hours.
d.   Cannot be determined from information given.

(10) The graph below shows Amy's marginal cost (MC) and marginal benefit (MB) from exercise. If Amy is rational, she will choose to exercise
a.   zero minutes.
b.   30 minutes.
c.   60 minutes.
d.   90 minutes.
e.   120 minutes
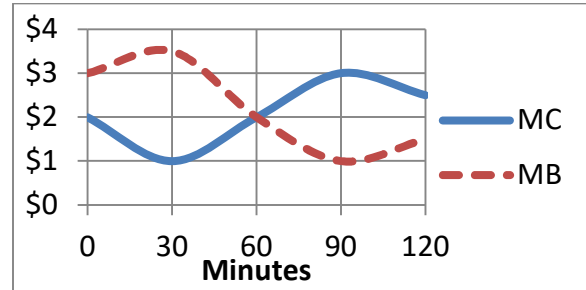
(11) Production of electric cars is increasing. An increase in the number of electric cars produced by each company is called a change at the
a.   extensive margin.
b.   intensive margin.
c.   marginal product.
d.   marginal revenue.

(12) Which is *not* a good reason to believe that business firms maximize profit?
a.   Firms whose managers resist maximizing profit are likely to be taken over by new owners who appoint managers more willing and able to maximize profit.
b.   The owners of firms get to keep the profits so they have an incentive to keep profits high.
c.   Maximizing profit is good for society and firms wish to maximize social welfare.
d.   Firms which do not maximize profit are often pushed out of the market by firms that do.

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

(14) A firm's total cost divided by its total output by definition equals the firm's
a. total revenue.
b. total cost.
c. marginal revenue.
d. marginal cost.
e. average cost.

(15) Price times a firm's quantity of output equals the firm's
a. total revenue.
b. total cost.
c. marginal revenue.
d. marginal cost.
e. average cost.

(16) The increase in a firm's total revenue from producing and selling one more unit of output by definition equals the firm's
a. total revenue.
b. total cost.
c. marginal revenue.
d. marginal cost.
e. average cost.

(17) All money paid by a firm for inputs equals by definition the firm's
a. total revenue.
b. total cost.
c. marginal revenue.
d. marginal cost.
e. average cost.

(18) The change in a firm's total cost divided by the change in its output by definition equals the firm's
a. total revenue.
b. total cost.
c. marginal revenue.
d. marginal cost.
e. average cost.

(19) A small firm in a big market maximizes its profit by
a. shifting its marginal cost curve up or down so that price equals marginal cost at its desired output level.
b. adjusting its price so that price equals marginal cost.
c. adjusting its output quantity so that price equals marginal cost.
d. all of the above.

(20) 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
a. increase by $3.
b. increase by $5.
c. increase by $8.
d. increase by $15.
e. remain constant.

(21) A cost that you cannot avoid no matter what action you take is called
a. an average cost.
b. an opportunity cost.
c. a marginal cost.
d. a variable cost.
e. a sunk cost.

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

(23) The formula for discounting shows that the present discounted value of a payment to be received in the future is *smaller*
a. the shorter the wait until the payment is received.
b. the longer the wait until the payment is received.
c. Present discounted value is not affected by the time until payment.
d. Cannot be determined from the information given.

(24) New firms enter an industry because they hope to
a. increase consumer surplus.
b. drive down the market price.
c. drive down the profits of existing firms.
d. enjoy economic profit.

(25) The short-run supply curve in the appliance industry shifts to the right when
a. new firms enter the industry.
b. firms exit the industry.
c. demand becomes more elastic.
d. cost curves fall.
e. None of the above.

(26) The following graph shows the short-run and long-run supply curves for a typical industry. Which curve is the long-run supply curve?
a. Curve A.
b. Curve B.
c. Cannot be determined from the information given.
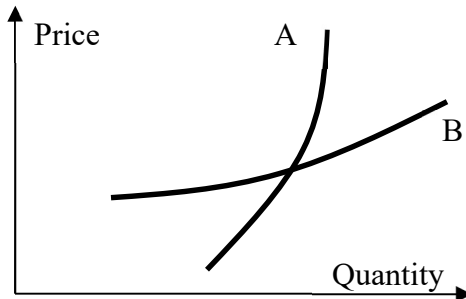
(27) *Price equals marginal cost* in a competitive industry in both short-run and long-run equilibrium because
a. business owners have a sense of fairness.
b. individual firms adjust their output levels to maximize profit.
c. consumers refuse to pay more than what is reasonable.
d. positive profits encourage entry of new firms while negative profits encourage existing firms to leave the industry.
e. the threat of government regulation causes firms to hold prices down.

(28) If the long-run supply curve for an industry slopes up, it is said to be
a. an increasing-cost industry.
b. a decreasing-cost industry.
c. a constant-cost industry.
d. a heavy industry.
e. a monopolistic industry.

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 choice and demand: 14 pts] The indifference curves in the graph below represent Jennifer's preferences for pizza and milkshakes.
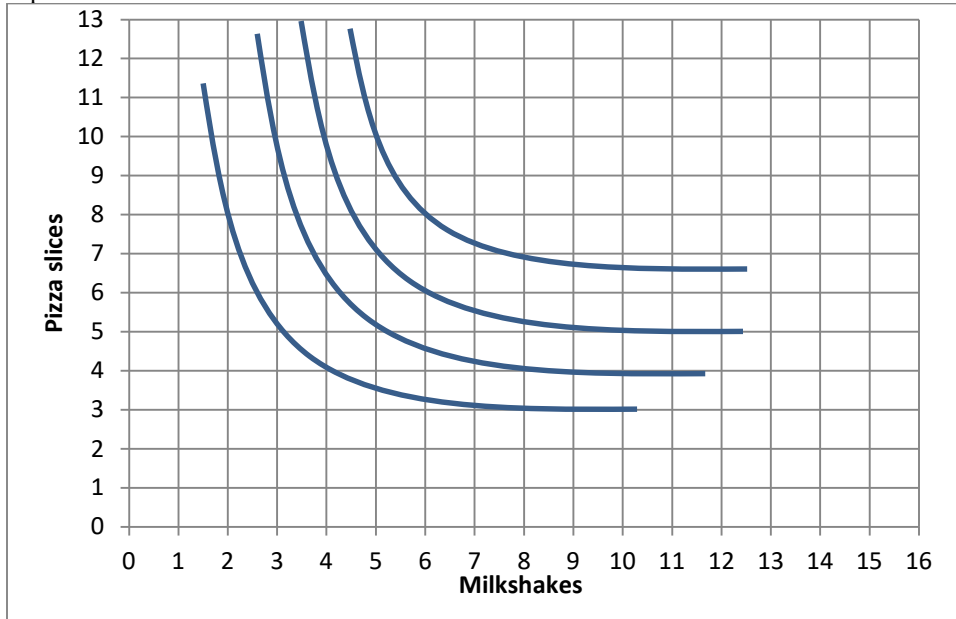
a. Would Jennifer rather have 7 pizza slices and 5 milkshakes, or 4 pizza slices and 11 milkshakes?

b. Would Jennifer rather have 10 pizza slices and 3 milkshakes, or 6 pizza slices and 6 milkshakes?

pizza slices	milkshakes
and	
pizza slices	milkshakes
and	

Suppose Jennifer has a budget of $60 to spend on pizza and milkshakes. The price of pizza slices is $6.

c. **Using a straightedge**, carefully draw Jennifer's budget line when the price of milkshakes is $4. Label this budget line "A".

d. How many milkshakes will Jennifer buy if the price of milkshakes is $4?   milkshakes

e. **Using a straightedge**, carefully draw Jennifer's budget line when the price of milkshakes is $10. Label this budget line "B".

f. How many milkshakes will Jennifer buy if the price of milkshakes is $10?   milkshakes

g. Plot two points on Jennifer's demand curve for milkshakes, and sketch Jennifer's demand curve at right.
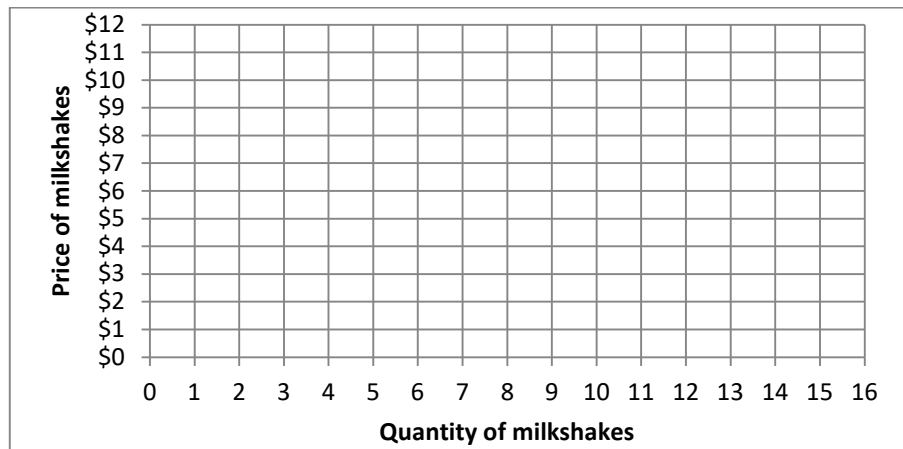
(2) [Rational choice: 10 pts] Big City is expanding its airport, building new gates. The airport manager has obtained cost estimates and computed benefit estimates as follows.

Gates	Total cost	Total benefit	Marginal cost per gate	Marginal benefit per gate
0	$ 0	$0		
			$ million	$ million
4	$16 million	$40 million		
			$ million	$ million
8	$28 million	$72 million		
			$ million	$ million
12	$40 million	$80 million		
			$ million	$ million
16	$56 million	$84 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 airport gates should Big City build? (Answer must be 0, 4, 8, 12, or 16).

gates

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

a. Suppose a particular project will *cost* a firm $1000 today, but will bring $600 in revenue one year from today, and $450 in revenue two years from today. Compute the *net present value* of this project to the nearest whole dollar.

$

b. Suppose a firm expects to enjoy $1 million in profit every year, perpetually, beginning a year from today. Compute the value of the firm.

$ million

(4) [Short-run cost curves and supply: 20 pts] ABC Manufacturing Company makes a small part used in automobiles. ABC 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.
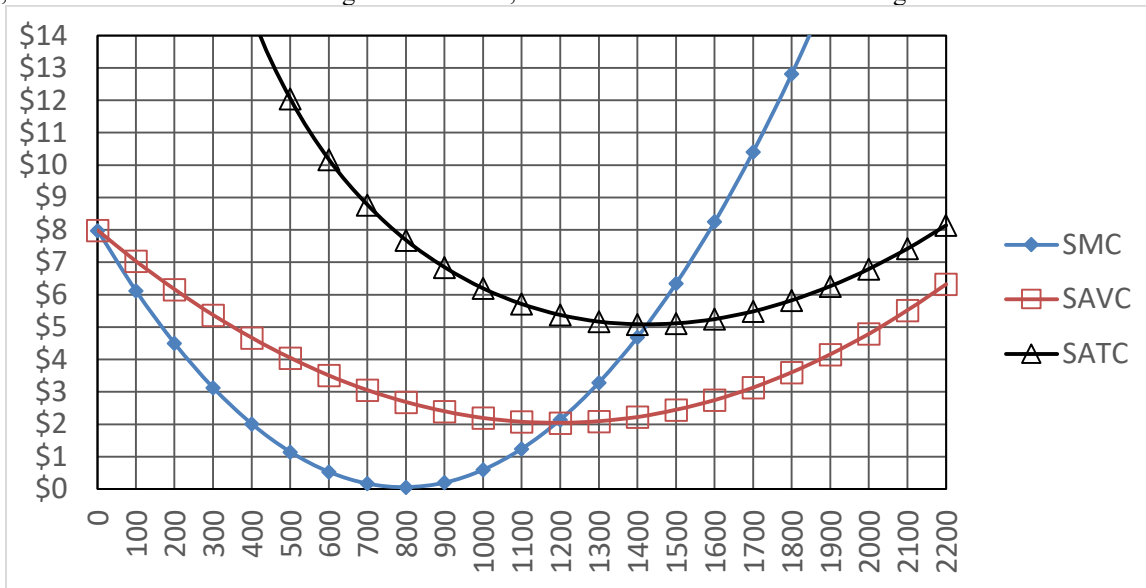
Suppose the company were currently producing 500 parts for some unknown reason.

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

$ _____ thousand

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

$ _____ thousand

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

$ _____ thousand

d. Suppose the company were currently producing 100 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 100 to 101 parts? (Give an answer to the nearest dollar.)

$ _____

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 $13. How many parts should the company produce? (Give an answer to the nearest hundred.)

_____ parts

h. Will the company make a *profit* or a *loss* at a price of $13?

i. Suppose the price of parts is $1. How many parts should the company produce? (Give an answer to the nearest hundred.)

_____ parts

j. Will the company make a *profit* or a *loss* at a price of $1?

(5) [Long-run competitive equilibrium: 24 pts] The graph below shows the market for scarfs, which is competitive. Assume all producers and potential producers have the same costs as each other.
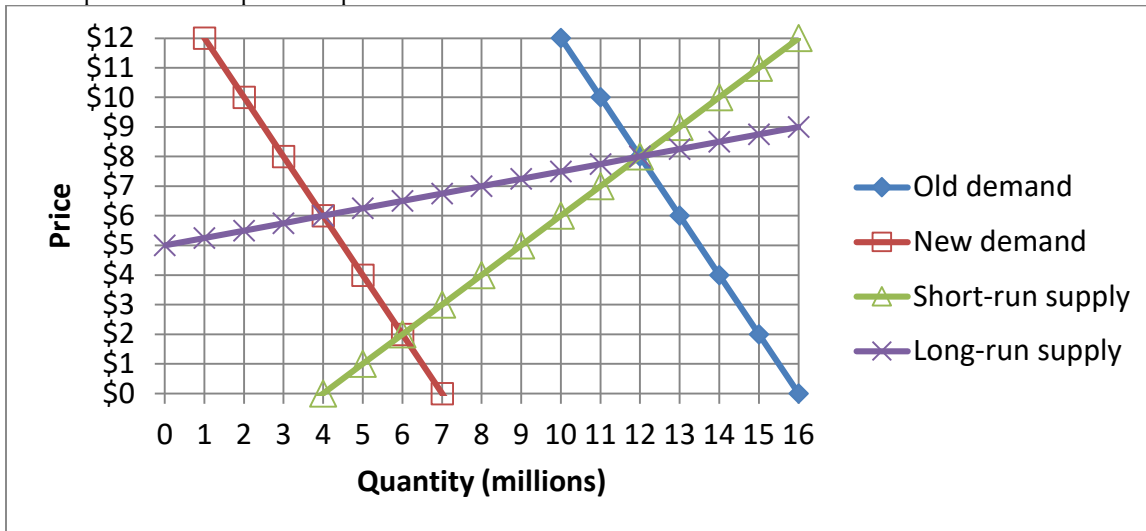
Initially the market is in long-run equilibrium, with the demand curve given by "old demand" and the short-run supply curve given by "short-run supply" as shown in the graph.

a. What is the initial equilibrium price?

$

b. What is the initial equilibrium quantity?

million

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

$

Suppose that scarfs become unpopular, 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?

million

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

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

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

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

$

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

million

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

$

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

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

[end of exam]