ECON 002 - Principles of Microeconomics
Drake University, Spring 2015
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Signature: ______________________________

Printed name: ______________________________

EXAMINATION 3 VERSION C
"Choices Underlying Supply and Demand"
April 8, 2015

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 pt each, 12 pts total]

(1) A change in the amount of fast food that each person buys is called a change at the
a. marginal product.
b. marginal revenue.
c. extensive margin.
d. intensive margin.

(2) The price of orange juice is $1 per can. The price of milk is $4 per gallon. Amy's income is $60. Amy's opportunity cost of a gallon of milk is
a. 1/4 can of orange juice.
b. 1 can of orange juice.
c. 2 cans of orange juice.
d. 4 cans of orange juice.
e. 15 cans of orange juice.
f. 60 cans of orange juice.
g. 240 cans of orange juice.

(3) If income increases by 20% but prices do not change, then
a. the consumer's budget line does not change.
b. the slope of the consumer's budget line does not change but the line shifts out.
c. the slope of the consumer's budget line does not change but the line shifts in.
d. the slope of the consumer's budget line changes.
e. the consumer's budget line becomes curved away from the origin.

(4) The price of water is approximately equal to
a. the average value to the consumer of all gallons of water that a consumer buys.
b. the value to the consumer of the last gallon of water that a consumer buys.
c. the value to the consumer of the first gallon of water that a consumer buys.
d. none of the above.

(5) 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 $25 per hour, and the marginal cost is $25. 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.

(6) If at a certain level of output, marginal cost is *equal to* average cost, then the average cost curve must be
a. upward-sloping.
b. downward-sloping.
c. at its minimum point.
d. Cannot be determined from information given.

(7) If a firm takes the market price as given, its *marginal revenue* curve is
a. a downward-sloping curve with increasing slope.
b. an upward-sloping curve with decreasing slope.
c. a downward-sloping line.
d. a horizontal line.
e. an upward-sloping line through the origin.

(8) At its current level of output, ABC Company's marginal cost is $10, its average cost is $6, and its marginal revenue is $10. If ABC produces and sells one more unit of output, its profit will
a. increase by $2.
b. decrease by $2.
c. increase by $8.
d. decrease by $4.
e. remain constant.

(9) Acme Corporation expects that customer A will pay it $100 one year from today and that customer B will pay it $100 two years from today. Which payment has smaller present discounted value?

a. Customer A's payment.
b. Customer B's payment.
c. The present discounted values of two payments are equal.
d. cannot be determined from the information given.

(10) New firms enter an industry because they hope to

a. enjoy economic profit.
b. increase consumer surplus.
c. drive down the market price.
d. drive down the profits of existing firms.

(11) When firms *exit* an industry, this has the effect of shifting the short-run supply curve

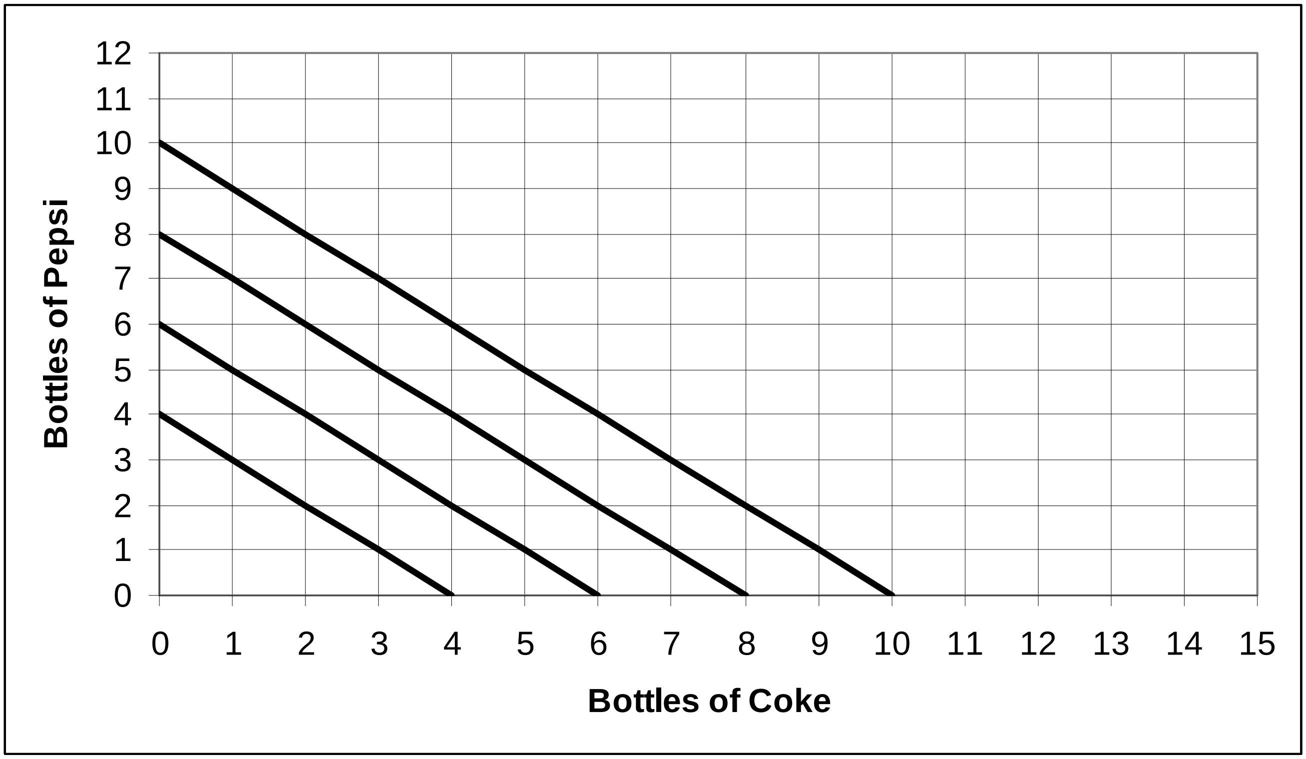
a. down.
b. to the right.
c. to the left.
d. Cannot be determined from information given.

(12) Suppose a competitive market 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) [Extreme preferences: 10 pts] Adam's preferences for Coke and Pepsi are depicted in the straight-line **indifference curves** shown below.



a. Which would Adam prefer to have: 4 bottles of Coke and 4 bottles of Pepsi, or no bottles of Coke and 6 bottles of Pepsi?

bottles of Coke and	bottles of Pepsi

b. Does Adam view Pepsi and Coke as *perfect substitutes, perfect complements,* or *neither?*

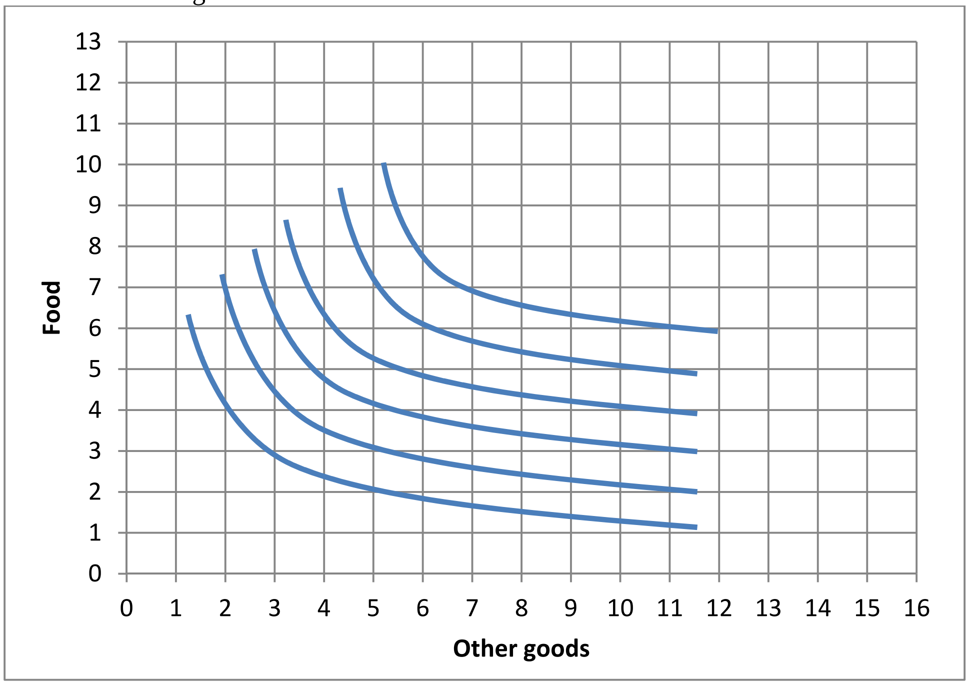
Assume that bottles of Pepsi cost $1.00 and bottles of Coke cost $2.00. Adam's income is $10, which he spends only on these two items.

c. **Using a straightedge,** carefully draw Adam's budget line on the graph above.

d. How many bottles of Pepsi will Adam purchase? bottles

e. How many bottles of Coke will Adam purchase? bottles

(2) [Consumer choice and demand: 16 pts] The indifference curves in the graph below represent Brittany's preferences for food and other goods.



a. Would Brittany rather have 7 units of food and 7 units of other goods, or 5 units of food and 11 units of other goods?

b. Would Brittany rather have 7 units of food and 2 units of other goods, or 3 units of food and 11 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 $30 to spend on food and other goods. The price of other goods is $2.

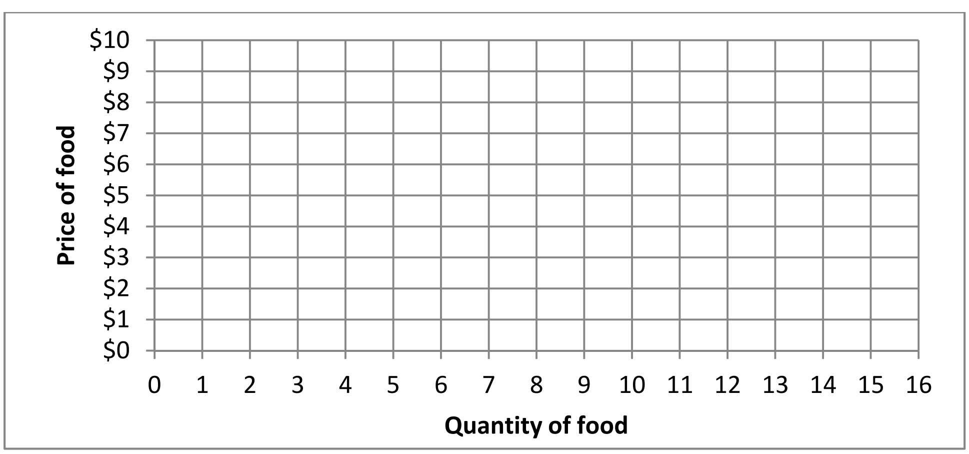
c. **Using a straightedge**, carefully draw Brittany's budget line when the price of food is $10. Label this budget line "A".

d. How much food will Brittany buy if the price of food is $10? units of food

e. **Using a straightedge**, carefully draw Brittany's budget line when the price of food is $3. Label this budget line "B".

f. How much food will Brittany buy if the price of food is $3? units of food

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



(3) [Rational choice: 10 pts] The county government is considering building a bicycle and running trail. The following are cost and benefit estimates for trails of different lengths.

Miles	Total cost	Total benefit	Marginal cost per mile	Marginal benefit per mile
0	$ 0	$0		
			$ thousand	$ thousand
5	$100 thousand	$300 thousand		
			$ thousand	$ thousand
10	$180 thousand	$400 thousand		
			$ thousand	$ thousand
15	$220 thousand	$450 thousand		
			$ thousand	$ thousand
20	$300 thousand	$500 thousand		

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 long should the trail be? (Answer must be 0, 5, 10, 15, or 20 miles.)

miles

(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	*Average revenue*	*Marginal revenue*
Total cost	*Average cost*	*Marginal cost*

a. Change in cost divided by change in output.

b. Money paid for all inputs purchased or hired.

c. Change in revenue divided by change in output.

(5) [Discounting: 4 pts] Answer the following questions, assuming the interest rate is **6 %.**

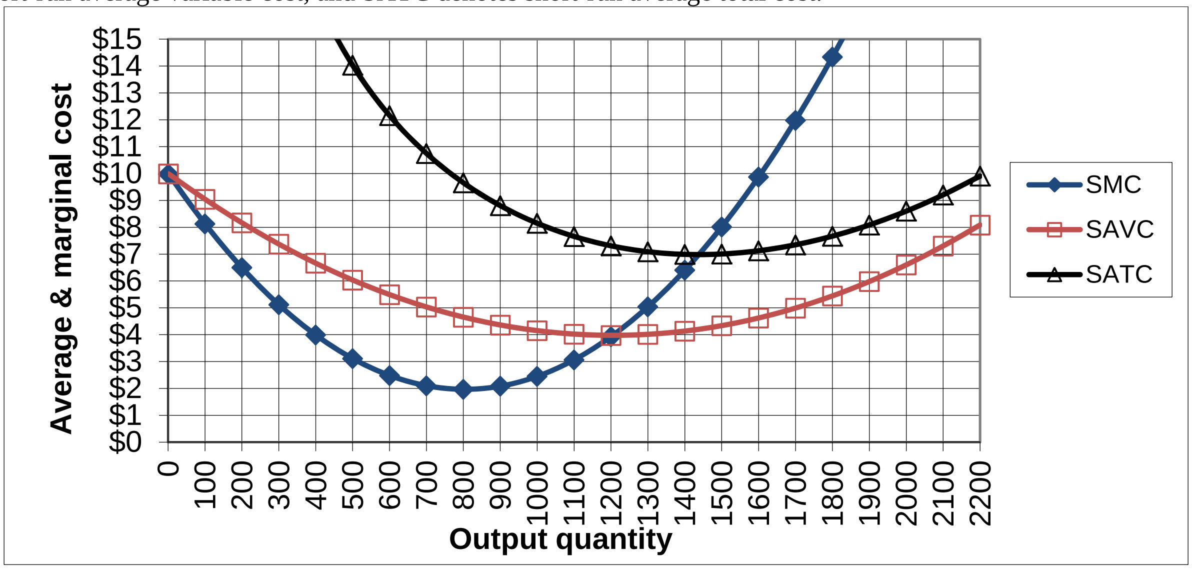
a. Suppose a particular project will *cost* a firm $4000 today, but will bring $2000 in revenue a year from today, and $3000 in revenue two years from today. Compute the *net present value* of this project to the nearest whole dollar.

$

b. Suppose a firm is expected to enjoy $18 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: 20 pts] Zoom Incorporated makes an automotive part for sports cars. 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.



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 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.) — $

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.) — $

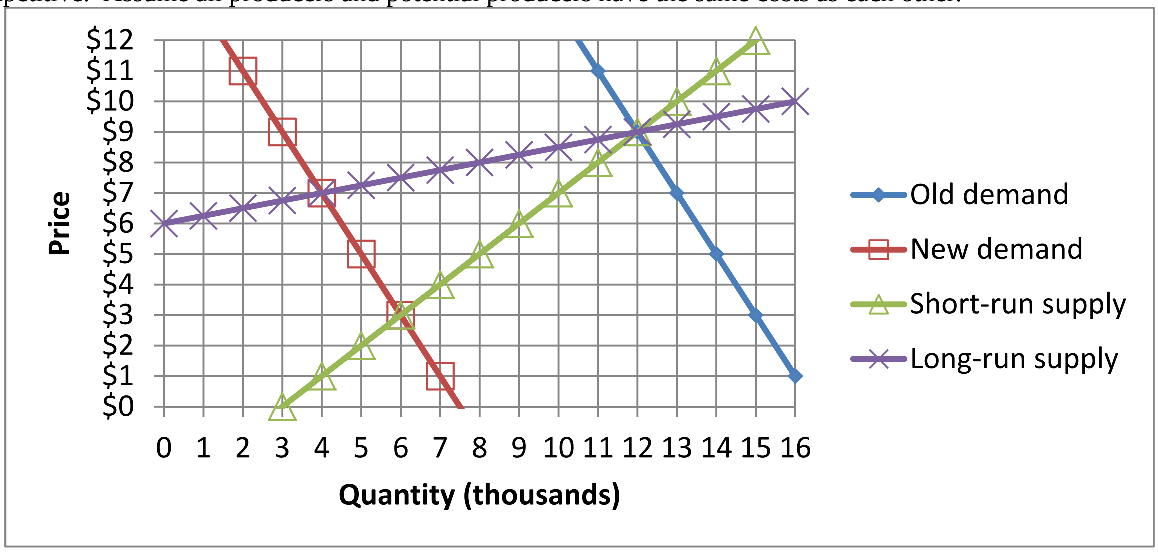
g. Suppose the price of parts is $3. How many parts should the company produce? (Give an answer to the nearest hundred.) — parts

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

i. Suppose the price of parts is $5. 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 $5?

(7) [Long-run competitive equilibrium: 24 pts] The graph below shows the market for tie-dye tee-shirts, 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?	thousand
c. What is the average cost of production for firms in this industry?	$

Suppose that tie-dye tee-shirts go out of fashion, 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?	thousand
f. Are tie-dye tee-shirt producers 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?	thousand
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?	

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

(1) Draw an indifference curve where one good is an undesirable good, such as pollution, and the other is a desirable good, such as housing. In contrast to our assumptions in class, assume the undesirable good *cannot be given away*. Which way does the indifference curve slope, up or down? Why?

(2) Consider the following statement. "To maximize profit, a business should keep its costs as low as possible. So it should always operate at the output level where its *average cost is lowest*, regardless of the product price." Do you agree or disagree? Justify your answer using a graph of the business's cost curves.

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]