EXAMINATION 4 VERSION B
"Perfect and Imperfect Competition"
November 28, 2016

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators, calculators with alphabetical keyboards, wireless devices and mobile phones 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) Suppose the pencil industry is perfectly competitive and the price of a pencil is $0.10. Then any firm in the pencil industry believes its marginal revenue is
a.   zero.
b.   exactly equal to $0.10.
c.   more than $0.10.
d.   less than $0.10.

(2) Suppose for some reason that the quantity traded in the market for petroleum is 40 million barrels, but the market is not in equilibrium. Rather, at this quantity, the height of the supply curve is $50 and the height of the demand curve is $30. Then producing one more barrel of petroleum would
a.   increase social welfare by $80.
b.   increase social welfare by $50.
c.   decrease social welfare by $40.
d.   decrease social welfare by $20.
e.   Cannot be determined without knowing the equilibrium price.

(3) Efficiency in consumption requires that all consumers
a.   choose identical combinations, or bundles, of goods.
b.   have equal incomes.
c.   have the same budget lines.
d.   have equal marginal rates of substitution.
e.   All of the above.

(4) Firms X and Y both produce motor oil, but for some unknown reason, Firm X's marginal cost is $5 and Firm Y's marginal cost is $2. If one quart of output is shifted from Firm X to Firm Y, then total industry costs will
a.   increase by $2.
b.   increase by $3.
c.   increase by $5.
d.   decrease by $2.
e.   decrease by $3.
f.   decrease by $5.

(5) An industry is a natural monopoly if
a.   a firm's average cost is negatively related to its quantity.
b.   the industry became a monopoly without government interference.
c.   the only seller in the market sells a natural or "green" product.
d.   one firm owns all the key natural resources required to produce the product.

(6) Suppose a coffee shop sells 20 cups of specialty coffee if the price is $3, and sells 21 cups of the same coffee if the price is $2.95. The shop's marginal revenue of the 21st cup is therefore
a. $0.05 .
b. $1.95 .
c. $2.20 .
d. $2.95 .
e. $3.00 .
f. $20.00 .

(7) Economists are opposed to monopolies because monopolies
a. make people buy things that people don't really want.
b. advertise too much.
c. create unhealthy concentration of social power.
d. set prices that exclude some buyers who are willing to pay the marginal cost.
e. make the rich richer, and the poor poorer.
f. All of the above.

(8) Suppose a performing-arts center is a monopolist and it knows that student's demand for tickets is *more* elastic than the general public's demand. To maximize profit, it should set the tickets price for students
a. equal to the price for the general public, because the marginal cost is the same.
b. above the price for the general public.
c. below the price for the general public.
d. Cannot be determined from information given.

(9) Cartels are organizations of firms that try to increase their members' profits by
a. reducing output.
b. sharing technology.
c. boosting output.
d. increasing advertising.
e. offering discounts and promotional pricing.

(10) A cartel must face the problem that each member firm will want to cheat on the cartel agreement by
a. raising its price higher than the cartel's agreed price.
b. increasing output beyond its quota.
c. producing less than its quota of output.
d. none of the above.

(11) Antitrust laws prohibit
a. deceptive advertising
b. anticompetitive practices.
c. dishonest accounting practices.
d. all of the above.

(12) Marginal-cost pricing occurs in markets characterized by
a. monopolistic competition.
b. Cournot oligopoly.
c. perfect competition.
d. monopoly.
e. both (a) and (c).

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) [Monopoly price discrimination: 8 pts] Suppose the producer of "The Nut Cracker" ballet sells tickets to both children and adults. The producer believes the elasticity of demand by children is –11, and the elasticity of demand by adults is –3.

a. Suppose the ticket price for children increased by 3%. How many fewer tickets would be sold to children?

%

b. Suppose the ticket price for adults increased by 3%. How many fewer tickets would be sold to adults?

| % |
|---|

Assume the producer's marginal cost of a ticket is $20.

c. Compute the profit-maximizing ticket price for children.

$

d. Compute the profit-maximizing ticket price for adults.

$

(2) [Economy-wide efficiency: 20 pts] The graph at
right shows a country's production possibility curve.

a. What is this **country's** opportunity cost of a gallon of gasoline? | units of other goods
b. What is this **country's** opportunity cost of a unit of other goods? | gallons of gasoline
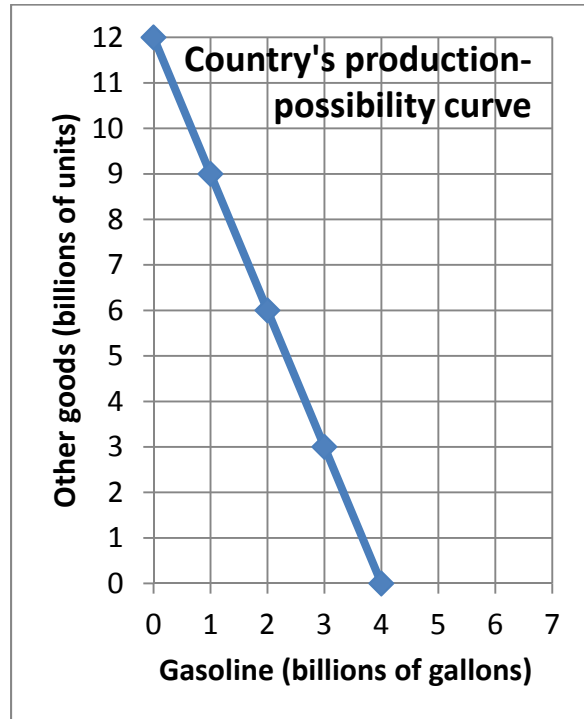
Assume this country's economy is in competitive
equilibrium in all markets and the price of a unit of other
goods is $2 .

c. What must be the price of a gallon of gasoline? | $
d. What is the marginal cost of producing a unit of other goods? | $
e. What is the marginal cost of producing a gallon of gasoline? | $

Country's production-possibility curve

Amy is a consumer in this economy. She has an income
of **$ 60**.

f. *Using a straightedge,* draw Amy's budget line in the graph at right.
g. What is the slope of Amy's budget line?
h. What is **Amy's** opportunity cost of a gallon of gasoline? | units of other goods
i. What is **Amy's** opportunity cost of a unit of other goods? | gallons of gasoline
j. What is Amy's marginal rate of substitution of gasoline for other goods—that is, the slope of her indifference curve—at her preferred bundle on this budget line?

Amy's budget line
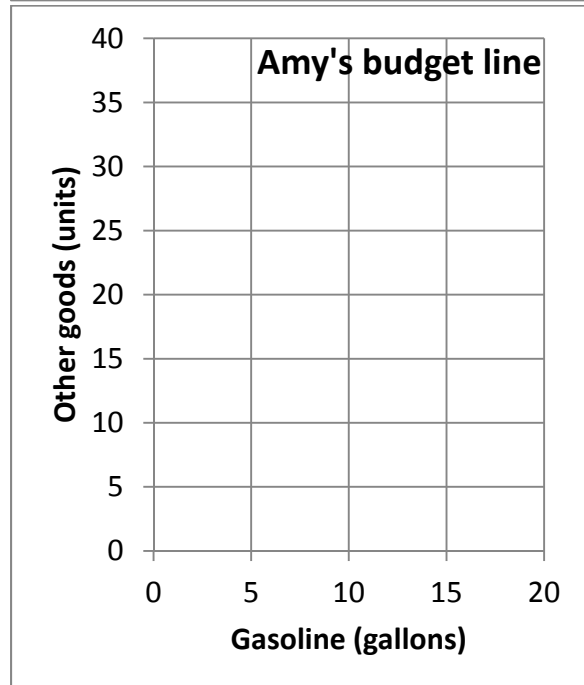
(3) [Monopoly, price discrimination: 20 pts] Happy Bunny Hill is the only ski slope in town, so it enjoys a local monopoly. Its monthly marginal cost, average cost, and demand curves are shown below.
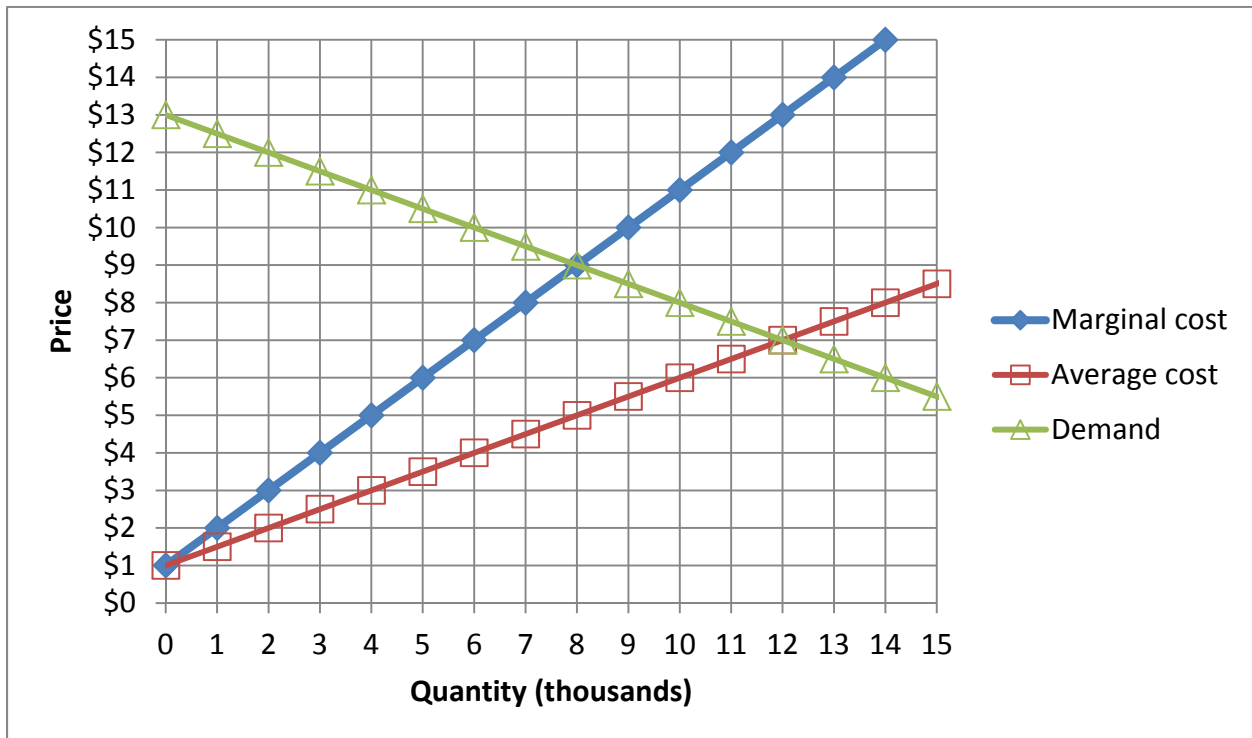
First, suppose the ski slope must charge the same admission price to everyone.

   a. *Using a straightedge*, draw and label Zippy's marginal revenue curve.

   b. Compute the ski slope's profit-maximizing quantity.

	thousand

   c. Compute the price that the ski slope would charge.

$	

   d. Compute the ski slope's profit.

$	thousand

   e. Compute consumer surplus

|	
$	thousand

   f. Compute the social deadweight loss from this pricing scheme.

$	thousand

Second, suppose the ski slope can charge a different admission price to each person, equal to the maximum price that person is willing to pay. In other words, suppose *perfect price discrimination* is possible.

   g. Compute the ski slope's profit-maximizing quantity.

	thousand

   h. Compute the ski slope's revenue.

$	thousand

   i. Compute the ski slope's profit.

$	thousand

   j. Compute consumer surplus.

$	thousand

   k. Compute the social deadweight loss from this pricing scheme.

$	thousand

(4) [Competition versus collusion: 16 pts] Suppose a small group of firms produce laundry soap. The graph below shows the demand curve for laundry soap, and the joint marginal cost or supply curve of the group of firms.
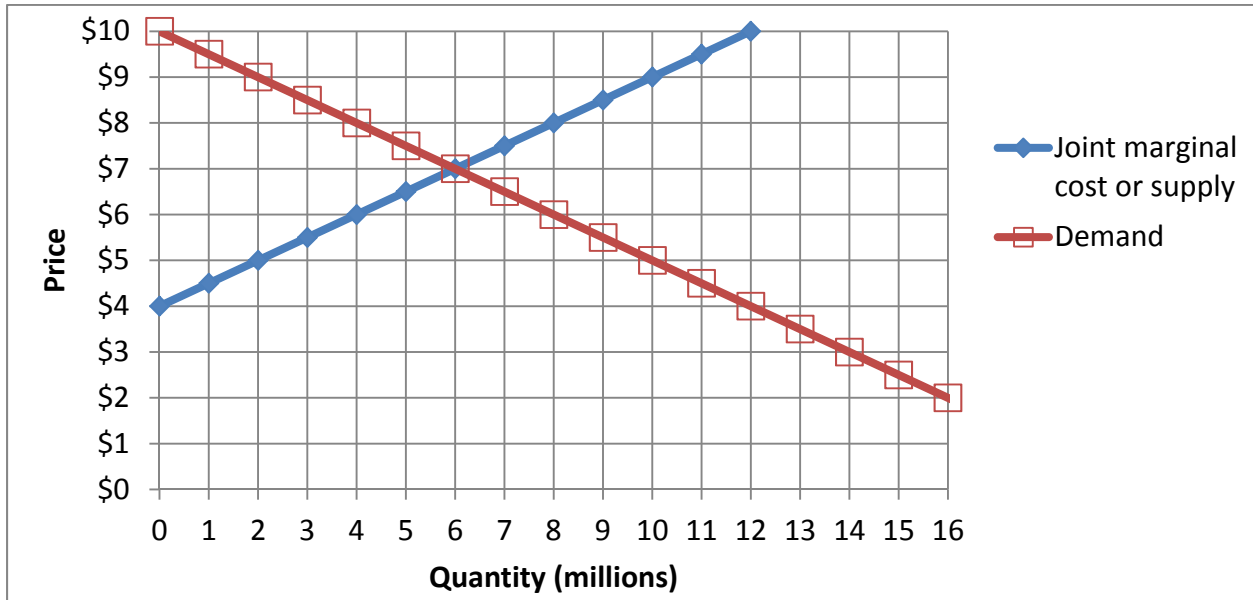
First, assume the firms *compete* with each other, each maximizing its own profit while taking the market price as given.

a. What will be the equilibrium market quantity?

million

b. If output increased by one more unit at any firm, total costs would increase by how much?

c. What will be the equilibrium market price?

$
$

Second, alternatively assume the firms *collude* with each other, setting price jointly as a cartel to maximize the sum of their profits.

d. *Using a straightedge*, draw and label the colluding firms' marginal revenue curve.

e. What total quantity will the firms produce?

million

f. If output increased by one more unit at any firm, total costs would increase by how much?

g. What price will the firms jointly set?

$
$

h. Compute the deadweight loss from collusion.

$ million

(5) [Monopolistic competition: 20 pts] Ryan sells bratwurst sandwiches from his food truck downtown. The graph below shows his cost curves and demand curve.
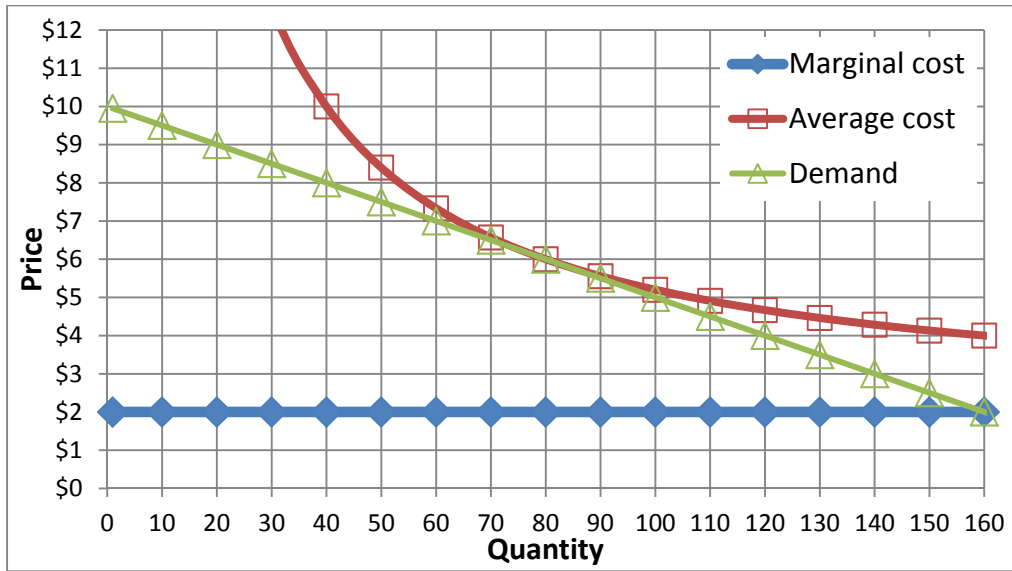
a. Although there are other food trucks nearby, Ryan's demand curve slopes down. Does that indicate that food from different trucks are *perfect substitutes* or *differentiated products*?

First suppose that Ryan sets a price of $8 per sandwich, for some unknown reason.

b. How many sandwiches will he sell?

	sandwiches

c. Will Ryan make a *profit* or a *loss* ?

d. How much?

$	

Now suppose that Ryan sets a price to maximize his profit.

e. *Using a straightedge*, draw and label Ryan's marginal revenue curve.

f. How many sandwiches will he sell?

	sandwiches

g. What price will Ryan set for his sandwiches?

$	

h. What is Ryan's marginal cost of a sandwich?

$	

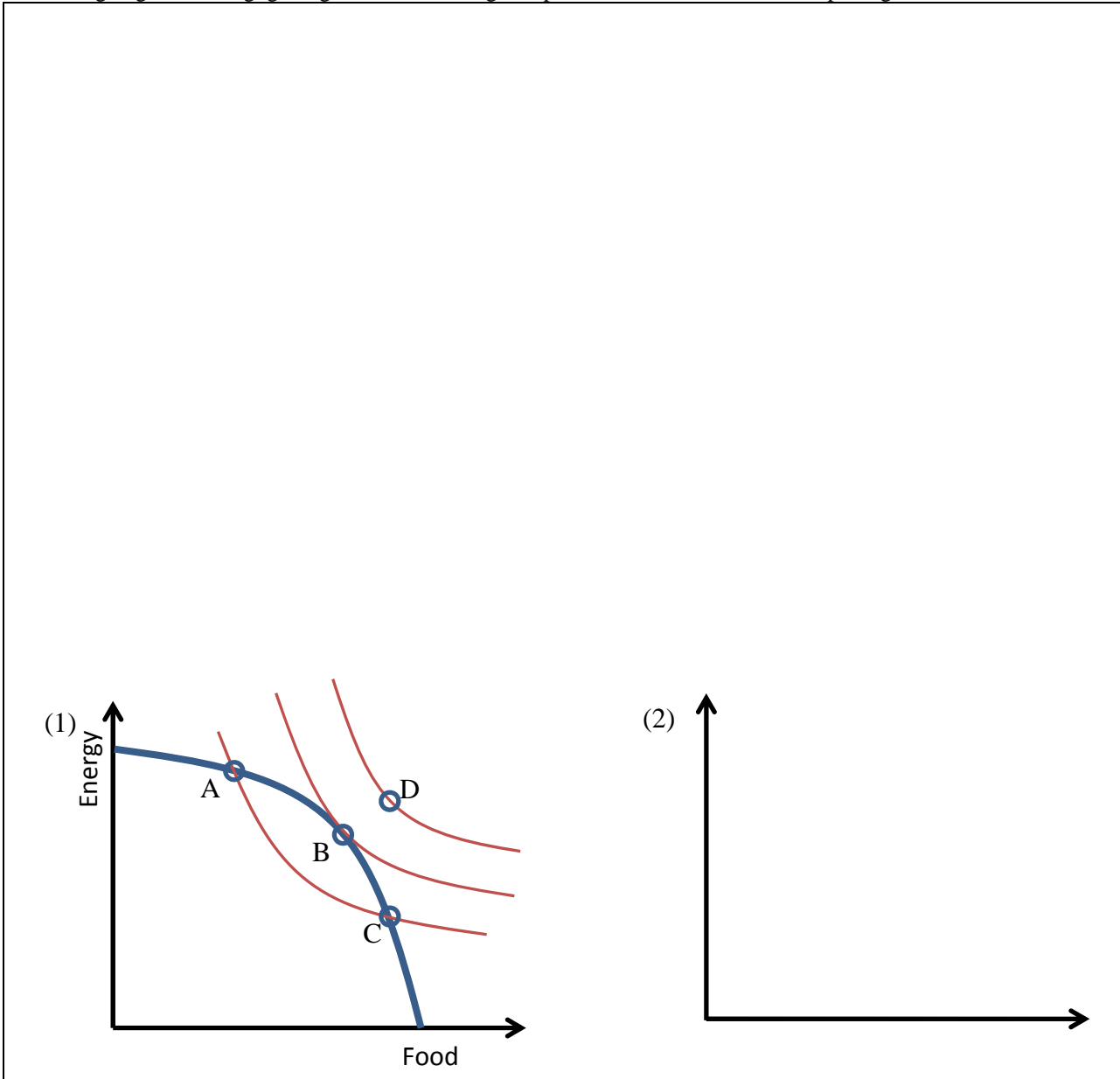i. What is Ryan's average cost of a sandwich?

$	

j. Ryan clearly has market power because his demand curve slopes down. So why does he have zero economic profit? Give the most plausible explanation.

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

(1) The graph at bottom left describes the economy of Fredonia. The thick curve is Fredonia's production possibility curve and the thin curves are indifference curves for a representative consumer. In Fredonia, the market for food is competitive, but the market for energy is a *monopoly*. Where is Fredonia's economy—point A, B, C, or D? Why?

(2) Suppose the government permitted airlines to set prices cooperatively. Who would gain? Who would lose? Would society as a whole gain or lose? Justify your answers with a supply-and-demand graph at bottom right. *Label all 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.

(1)

Energy

A

D

B

C

Food

(2)

[end of exam]