EXAMINATION 1 VERSION B
"Competitive Supply and Demand"
February 21, 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. 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, 15 pts total]

(1) The assumption in economics that people are *rational* implies that people
a. maximize their income.
b. use math to make decisions.
c. ignore "soft" concerns like friendships and charity.
d. do the best they can with what they have.
e. make sacrifices today for a better future.

(2) Ana buys a ticket to a concert for $25. When she arrives at the venue, she discovers that scalpers are willing to pay $100 for her ticket. Her *opportunity cost* of attending the game is now
a. $25.
b. $75.
c. $100.
d. $125.

(3) Rational choice implies pursuing an activity until the marginal cost of the last unit
a. is much greater than its marginal benefit.
b. begins to exceed its marginal benefit.
c. begins to fall below its marginal benefit.
d. is much less than its marginal benefit.

(4) In economics, an *equilibrium* is a situation where
a. inflation equals zero percent.
b. economic growth is zero.
c. total costs equal total benefits.
d. no one wants to change their choices.

(5) "GDP has increased this year" is an example of
a. a positive statement.
b. a normative statement.
c. both of the above.
d. none of the above.

(6) Economic or physical capital includes
a. trucks and bulldozers.
b. machinery and equipment.
c. factories and office buildings.
d. all of the above.
e. none of the above.

(7) A production function shows the relationship between the
a. quantity of input and the quantity of output.
b. current level of output and the past level of output.
c. level of output and the level of demand for output.
d. price of output and the quantity produced.

(8) Is the production function below characterized by diminishing returns to labor input?
a. Yes, for all levels of labor input.
b. No, not for any levels of labor input.
c. Yes, but only after 6 hours of labor input.
d. Yes, but only before 6 hours of labor input.
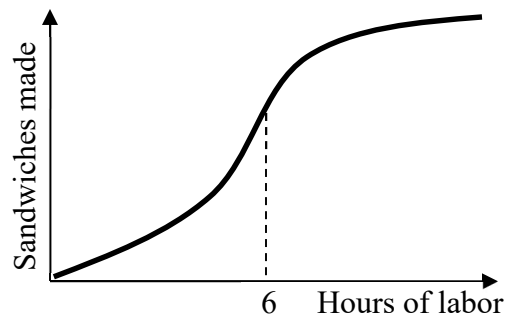
(9) Monetary exchange is more common today than bartering because
a. bartering requires a "double coincidence of wants."
b. bartering is often illegal whereas anything can be legally bought and sold with money.
c. bartering is a lost art.
d. monetary exchanges are subject to less tax.

(10) The Law of One Price means
a. the buyer and the seller in each transaction must agree on a price.
b. efficient markets eliminate price dispersion.
c. the total quantity buyers want to buy is negatively related to the price.
d. a good cannot be resold.
e. all sellers are required by law to quote the same price.

(11) A demand curve for laptop computers shows how the quantity of laptop computers people want to buy is affected by
a. the price of substitutes, like desktop computers.
b. the laptop computer's features.
c. the income of consumers.
d. the price of laptop computers.

(12) If the price of gasoline rises, consumers will buy fewer large sport-utility vehicles, because gasoline and SUVs are
a. substitute goods.
b. complementary goods.
c. inferior goods.
d. normal goods.

(13) The *law of supply* means
a. legal regulation of sellers.
b. there is always someone willing to sell a product.
c. the quantity that sellers want to produce and sell is positively related to the price.
d. sellers can charge whatever price they want.

(14) Some people believe there is excess demand in the housing market. If they are right, then the price of houses can be expected to
a. rise.
b. fall.
c. remain constant.
d. Price movements are not related to excess demand.

(15) In winter, the price of tomatoes increases and the quantity sold decreases. This could be caused by a
a. rightward shift in the demand for tomatoes.
b. rightward shift in the supply of tomatoes.
c. leftward shift in the demand for tomatoes.
d. leftward shift in the supply of tomatoes.

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) [Marginal cost: 2 pts] Suppose a package of four pairs of socks costs $9, while a package of five pairs costs $10. Compute the marginal cost of the fifth pair.

> $

(2) [Percent change, midpoint formula: 2 pts] Suppose the average price of electricity in State A is 15 cents per kilowatt-hour, while the average price in State B is 9 cents per kilowatt-hour. Compute the percent difference using the midpoint formula.

> %

(3) [Percent change with multiplication: 4 pts] Suppose the price paid by an average family for milk increases by 8 percent, while the quantity purchased decreases by 3 percent.

a. Does the average family's spending on milk *increase* or *decrease*?

b. By approximately how much?

> %

(4) [Production functions: 7 pts] A work crew plants trees. Complete the table by computing the work crew's average product and marginal product and placing your answers in the unshaded cells of the third and fourth columns below. Then answer the question below.

Number of workers	Trees planted per day	Average Product	Marginal Product
0 workers	0 trees		
			trees per worker
5 workers	5 trees	trees per worker	
			trees per worker
10 workers	20 trees	trees per worker	
			trees per worker
15 workers	45 trees	trees per worker	

Is the work crew's production function characterized by *diminishing returns* to their labor input? Answer YES or NO.

(5) [Comparative advantage, gains from trade: 17 pts] Farmer A and Farmer B can each produce wheat and corn. They each face a tradeoff between these two crops because of limited land. Their production possibility curves are shown below.
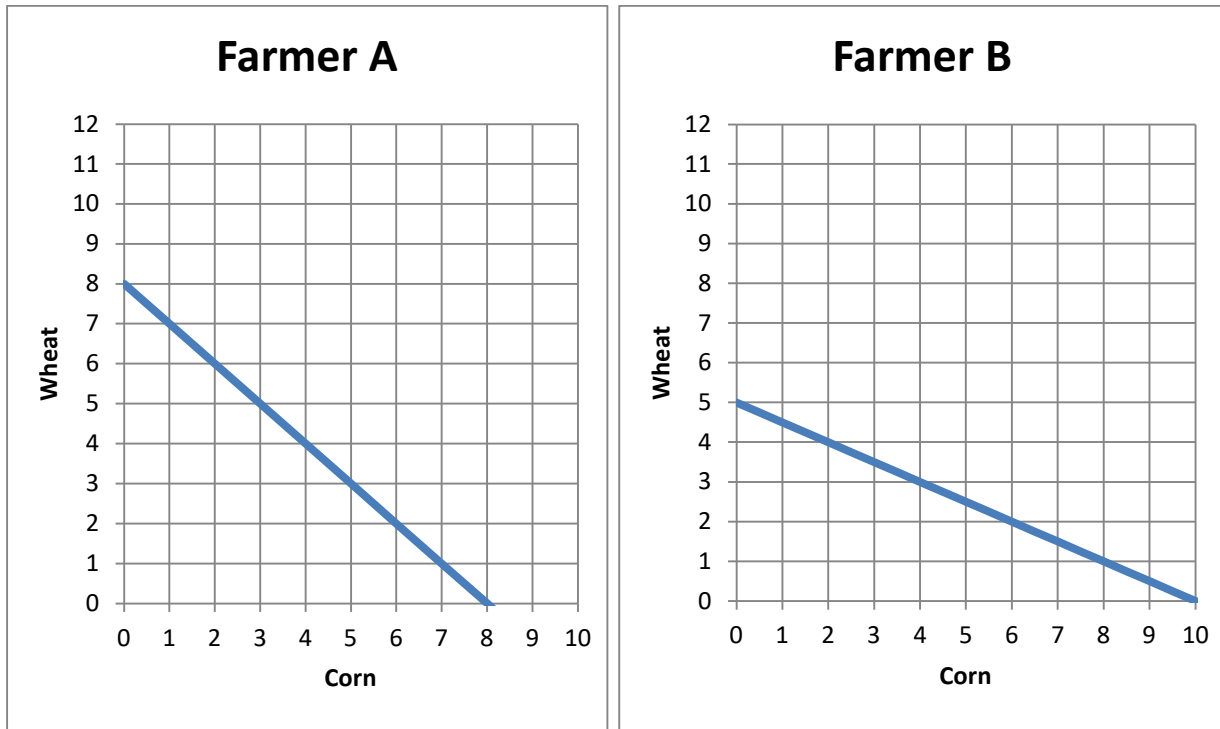
a. What is Farmer A's opportunity cost of producing a unit of corn?

b. What is Farmer B's opportunity cost of producing a unit of corn?

c. What is Farmer A's opportunity cost of producing a unit of wheat?

d. What is Farmer B's opportunity cost of producing a unit of wheat?

e. Which farmer has a comparative advantage in producing corn?

f. Which farmer has a comparative advantage in producing wheat?

	units of wheat
	units of wheat
	units of corn
	units of corn

g. [3 pts] Fill in the blanks: *Both* farmers can consume combinations of crops *outside* their individual production

possibility curves if _____ sends *two* units of wheat to

_____, who sends _____ units of corn in return.

h. **Plot** the trade that you propose in part (g) on the graphs above. For each farmer, plot and label the starting point representing **production before trade**, and the ending point representing **consumption after trade**.

(6) [Market equilibrium: 12 pts] Suppose seven buyers and seven sellers engage in a market similar to the exercise we did in class. Each buyer may buy at most one unit and each seller may sell at most one unit, but no one is forced to trade. Assume that buyers and sellers are each trying to maximize their own surplus (or "gains from trade"). Surplus for each buyer equals the buyer's value of the good minus the price paid. Surplus for each seller equals the price received minus the seller's cost of the good. Surplus of persons who do not trade are zero. Buyers' values and sellers' costs are given in the following table.

Buyer	Value		Seller	Cost
Bob	$14		Sue	$ 2
Barb	$12		Steve	$ 2
Ben	$10		Sam	$ 3
Bailey	$ 8		Sven	$ 3
Brian	$ 6		Sarina	$ 4
Betty	$ 4		Sean	$ 8
Bert	$ 2		Sally	$12

(graph at right, axes: Price ($0–$15) vs Quantity (0–8), for scratch work)
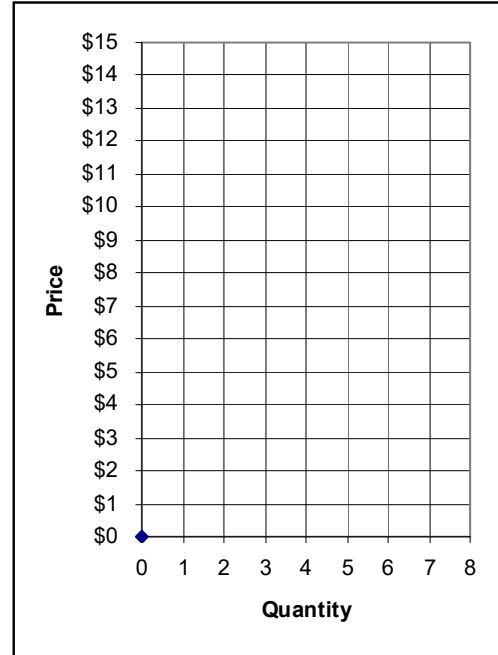
Suppose with some experience, the market settles on a single price. All trades are made at that price. (Hint: use the graph at right for scratch work.)

a. If the price were **$9**, would there by *excess demand, excess supply*, or *neither*?

Now consider the market equilibrium.
b. What is the equilibrium price? Give an answer to the nearest whole dollar.

$

c. How many units of the good will be sold in this market?

units

d. Compute the total revenue received by sellers (which equals the total spending by buyers).

$

e. Compute the combined total surplus (or gains from trade) of all buyers and sellers. (Check your answer carefully! No partial credit for being "close"!)

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f. Who enjoys higher surplus in this particular market, the *buyers* or the *sellers?* Or is buyers' total surplus *equal* to sellers' total surplus?

(7) [Shifts in demand and supply: 15 pts] Analyze each of the following markets according to the accompanying imaginary scenario.

a. Consider the market for ***sodapop***: Suppose consumers become more interested in avoiding junk food.
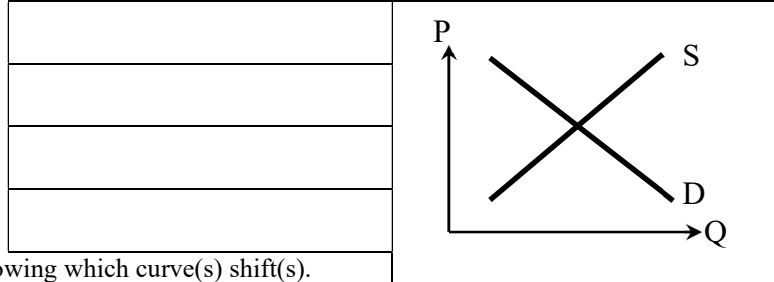
Does demand shift *left*, shift *right*, or remain *unchanged* ?
Does supply shift *left*, shift *right*, or remain *unchanged* ?
Does the equilibrium price *increase, decrease,* or *cannot be determined* ?
Does the equilibrium quantity *increase, decrease,* or *cannot be determined* ?
Sketch a graph of this scenario at right, showing which curve(s) shift(s).

b. Consider the market for ***high-efficiency light bulbs***. Suppose new technology allows these bulbs to be manufactured at much lower cost.
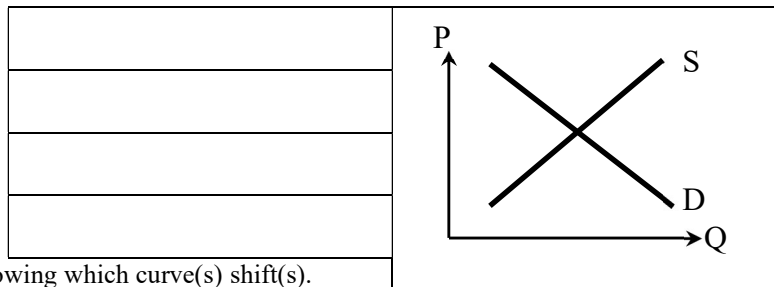
Does demand shift *left*, shift *right*, or remain *unchanged* ?
Does supply shift *left*, shift *right*, or remain *unchanged* ?
Does the equilibrium price *increase, decrease,* or *cannot be determined* ?
Does the equilibrium quantity *increase, decrease,* or *cannot be determined* ?
Sketch a graph of this scenario at right, showing which curve(s) shift(s).

c. Consider the market for ***automobiles***: New technologies lower the cost of making autos. Simultaneously, a boom raises consumers' incomes.
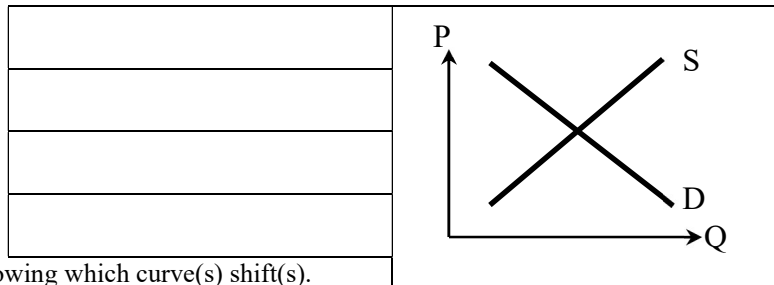
Does demand shift *left*, shift *right*, or remain *unchanged* ?
Does supply shift *left*, shift *right*, or remain *unchanged* ?
Does the equilibrium price *increase, decrease,* or *cannot be determined* ?
Does the equilibrium quantity *increase, decrease,* or *cannot be determined* ?
Sketch a graph of this scenario at right, showing which curve(s) shift(s).

(8) [Consumer surplus, producer surplus: 22 pts] The market for morel mushrooms is depicted in the graph below.
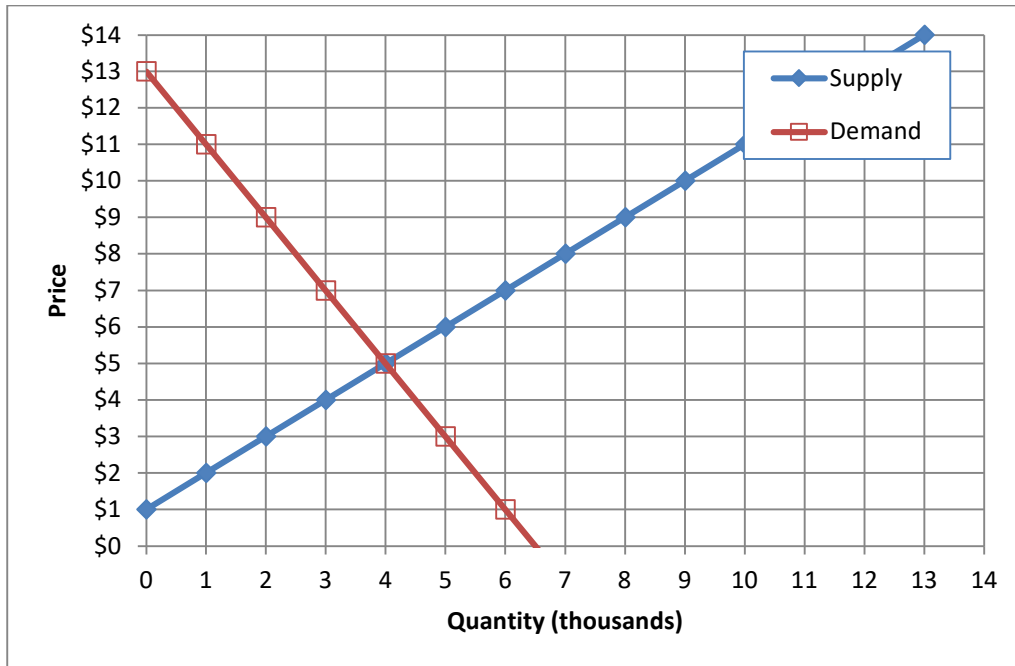
Suppose the price in this market were **$7** for some reason.
 a. Would there be *excess demand, excess supply*, or *neither*?

 b. How much?

thousand

 c. Would the price tend to *rise, fall*, or remain *constant*?

Now suppose the market is in equilibrium.
 d. What is the equilibrium price?

 e. What is the equilibrium quantity?

 f. How much are consumers willing to pay for the 3 thousandth mushroom?

 g. How much consumer surplus do they enjoy for the 3 thousandth mushroom?

 h. What is the marginal cost to producers of the 2 thousandth mushroom?

 i. How much producer surplus do they enjoy for the 2 thousandth mushroom?

 j. Compute total consumer surplus.

 k. Compute total producer surplus.

$
thousand
$
$
$
$
$ thousand
$ thousand

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

(1) Consider the following statement. "The United States produces more cars and more corn than Mexico. Therefore, the United States cannot benefit from trade with Mexico in these goods." Assume the first sentence is correct. Do you agree or disagree with the second sentence? Justify your answer. (Ignore the graph.)

(2) Why are blueberries cheap in Iowa in summer, but expensive in winter? Justify your answer using a supply-and-demand graph, labeling all axes and 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]