

### Sample Exam 1

**Part 1: Diagrams and Short Answer** (8 points each, 24 points total)

1. Given a demand function:  $Q_{dx} = 400 - 100P_x - 50P_y + 0.01I$ , where
- |   |  |
|---|--|
| { | $Q_{dx}$ = Quantity demand of good $x$ |
|   | $P_x$ = Price of good $x$              |
|   | $P_y$ = Price of related good $y$      |
|   | $I$ = Income of potential buyers       |

- a. Write the simple demand function and inverse demand function if  $P_y = 4$  and  $I = \$60,000$  :

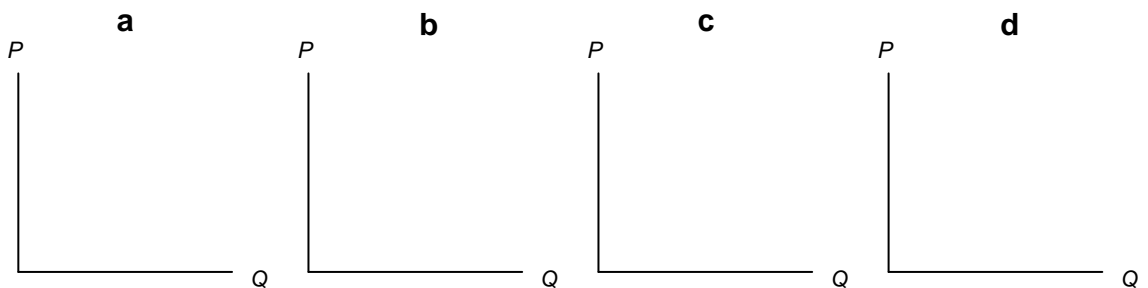
\_\_\_\_\_

Demand function

\_\_\_\_\_

Inverse demand function

- b. Use the information in part (a) to carefully construct a demand curve in the space to the right.
2. Modify the diagrams below with supply and demand curves to fully illustrate the effects on price and quantity of the following market conditions or events:
- A decrease in income for an inferior good.
  - The imposition of a binding price floor.
  - A major hurricane shuts down oil production along the gulf coast.
  - A market with perfectly inelastic supply and highly elastic demand.



3. In the space to the right, draw a production possibilities frontier (PPF) that illustrates the concept of increasing opportunity cost.

Then illustrate on the PPF one interpretation of a market failure.

Then add a second PPF to the same diagram showing the effect of biased economic growth (growth that occurs in only one of the two sectors).

**Part 2: Multiple Choice** (4 points each, 48 points total)

1. As a society produces more and more of one good, it must give up increasing amounts of alternative goods. This statement describes the
  - a. law of demand
  - b. convexity of the production possibilities frontier
  - c. law of increasing opportunity cost
  - d. principle of technical inefficiency
  - e. effects of shifts in the level of technology
2. Which of the following is likely to cause an outward shift of the production-possibilities curve?
  - a. Investment in infrastructure such as fiber optic networks and port facilities.
  - b. Deportation of illegal immigrants, thereby opening up of jobs previously held by them for U.S. citizens.
  - c. An increase in the unemployment rate.
  - d. A law that reduces the standard workweek from 40 hours to 35 hours.
  - e. A generalized increase in citizens preferences for consumer goods.
3. An engineer's knowledge and skills are referred to by economists as
  - a. entrepreneurship
  - b. human capital
  - c. physical capital
  - d. intellectual raw materials
  - e. over priced
4. Which of the following statements offers the best description of the "invisible hand?"
  - a. The unseen influence of the federal government as it modifies the distributional outcomes in our society through its tax and transfer policies.
  - b. Adam Smith's image of the price mechanism that efficiently communicates information to consumers and producers as they pursue their self interest.
  - c. Lobbyists who operate behind the scenes to influence the allocation of scarce social resources.
  - d. Karl Marx's image of business owners who use deceptive tactics to exploit their workers.
  - e. Freidrich Hayak's image of unseen market failures that disrupt the beneficial workings of markets.
5. Wine and cheese are complements if
  - a. the demand for wine increases when the price of cheese falls.
  - b. the demand curves of both goods shift whenever their respective supply curve shift.
  - c. the supply of wine increases when the price of cheese rises.
  - d. the demand for wine increases when the price of cheese rises.
  - e. the demand for wine and cheese rise and fall together.

6. If automobiles are a normal good and there is an increase consumer incomes, while at the same time auto workers receive a substantial pay raise, what will happen to equilibrium price and quantity in the automobile market?
  - a. price and quantity will rise
  - b. price and quantity will fall
  - c. price will rise; quantity will fall
  - d. quantity will rise; price change cannot be determined
  - e. price will rise; quantity change cannot be determined
  
7. An increase in equilibrium price and a decrease in equilibrium quantity could be caused by a(n)
  - a. increase in resource prices
  - b. increase in demand
  - c. increase in supply
  - d. a dramatic change in tastes and preferences
  - e. improvement in production technology
  
8. If demand is elastic, then:
  - a. Quantity demanded is not very responsive to changes in price.
  - b. Quantity demanded is very responsive to changes in price.
  - c. Consumer spending does not respond to changes in income.
  - d. Total revenue falls in response to a price decrease.
  - e. Total revenue rises in response to a price increase.
  
9. If, in the minds of consumers, there are very few, if any, good substitutes for good A, then
  - a. the supply of good A will tend to be price elastic.
  - b. the demand for good A will tend to be price elastic.
  - c. the supply of good A will tend to be price inelastic.
  - d. the demand for good A will tend to be price inelastic.
  - e. an increase in the price of good A will tend to be associated with a decrease in expenditures on good A.
  
10. Suppose a local government decides to effect a reduction in traffic congestion on a bridge by imposing a toll. The toll will be most effective if the price elasticity of demand for the bridge is:
  - a. Normal
  - b. Elastic
  - c. Inelastic
  - d. Unit Elastic
  - e. Substitutable
  
11. If the price elasticity of demand for Baja Fresh tacos is 3.5, then Baja Fresh can:
  - a. Take unfair advantage of its customers by raising the prices of its tacos.
  - b. Reduce the price of tacos by 35 percent and total revenue will remain the same.
  - c. Raise the price of tacos and total revenue will increase.
  - d. Reduce the price of tacos by less than 35 percent and total sales will remain the same.
  - e. Reduce the price of tacos and total revenue will increase.
  
12. Suppose that the market for some normal good is competitive and that incomes rise. If total expenditures on this good rise, then we know that
  - a. supply must have changed.
  - b. demand is price inelastic.
  - c. demand is price elastic.
  - d. demand is perfectly price elastic.
  - e. income elasticity is greater than 1.



5. Terms:

- a. What is the term for the view that government's role in the economy should be very limited?
- b. Monopolies, externalities, public goods, and asymmetric information are all categories of what general phenomenon?

6. Given a demand function:  $Q_{dx} = 400 - 100P_x - 50P_y + 0.01I$ , where

{	$Q_{dx}$ = Quantity demand of good $x$
	$P_x$ = Price of good $x$
	$P_y$ = Price of related good $y$
	$I$ = Income of potential buyers

- a. Are goods  $x$  and  $y$  substitutes or complements?
- b. Is good  $x$  a normal or inferior good?

7. Suppose the price elasticity of gasoline is -0.2. Compute the change in total expenditures on gasoline if prices were to increase by 50%.

Helpful hint: If a variable  $Z = x * y$ , then  $\% \Delta Z = \% \Delta x + \% \Delta y + (\% \Delta x + \% \Delta y)$

## Exam 1 -- Solutions

### Part 1: Diagrams and Short Answer (8 points each, 24 points total)

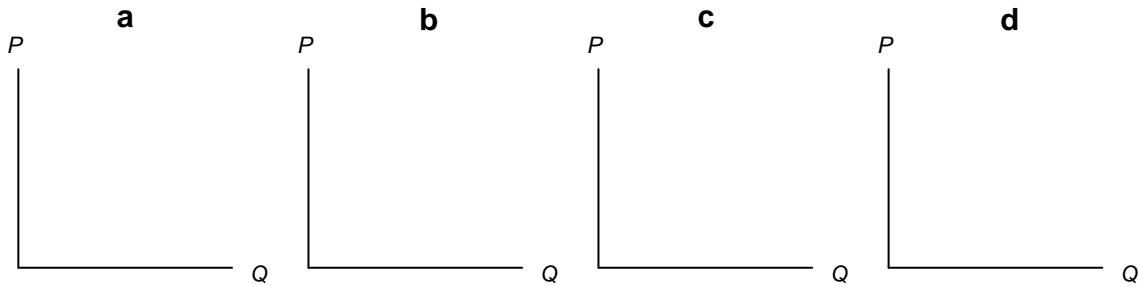
1. Given a demand function:  $Q_{dx} = 400 - 100P_x - 50P_y + 0.01I$ , where
- |          |   |                             |
|----------|---|-----------------------------|
| $Q_{dx}$ | = | Quantity demand of good $x$ |
| $P_x$    | = | Price of good $x$           |
| $P_y$    | = | Price of related good $y$   |
| $I$      | = | Income of potential buyers  |

- a. Write the simple demand function and inverse demand function if  $P_y = 4$  and  $I = \$60,000$  :

Demand function:  $Q_{dx} = 800 - 100P_x$

Inverse demand function:  $P_x = 8 - 0.01Q_x$

- b. Use the information in part (a) to carefully construct a demand curve in the space to the right.
2. Modify the diagrams below with supply and demand curves to fully illustrate the effects on price and quantity of the following market conditions or events:
- A decrease in income for an inferior good. *Outward shift of demand curve*
  - The imposition of a binding price floor. *Horizontal line above equilibrium*
  - A major hurricane shuts down oil production along the gulf coast. *Inward shift of supply curve*
  - A market with perfectly inelastic supply and highly elastic demand. *Vertical supply curve and nearly horizontal demand curve.*



2. In the space to the right, draw a production possibilities frontier (PPF) that illustrates the concept of increasing opportunity cost.

*See homework 1*

Then illustrate on the PPF one interpretation of a market failure.

Then add a second PPF to the same diagram showing the effect of biased economic growth (growth that occurs in only one of the two sectors).

### Part 2: Multiple Choice (4 points each, 48 points total)

1. As a society produces more and more of one good, it must give up increasing amounts of alternative goods. This statement describes the
- law of increasing opportunity cost

2. Which of the following is likely to cause an outward shift of the production-possibilities curve?
  - a. Investment in infrastructure such as fiber optic networks and port facilities.
3. An engineer's knowledge and skills are referred to by economists as
  - b. human capital
4. Which of the following statements offers the best description of the "invisible hand"?
  - b. Adam Smith's image of the price mechanism that efficiently communicates information to consumers and producers as they pursue their self interest.
5. Wine and cheese are complements if
  - a. the demand for wine increases when the price of cheese falls.
6. If automobiles are a normal good and there is an increase consumer incomes, while at the same time auto workers receive a substantial pay raise, what will happen to equilibrium price and quantity in the automobile market?
  - e. price will rise; quantity change cannot be determined
7. An increase in equilibrium price and a decrease in equilibrium quantity could be caused by a(n)
  - a. increase in resource prices
8. If demand is elastic, then:
  - b. Quantity demanded is very responsive to changes in price.
9. If, in the minds of consumers, there are very few, if any, good substitutes for good A, then
  - d. the demand for good A will tend to be price inelastic.
10. Suppose a local government decides to effect a reduction in traffic congestion on a bridge by imposing a toll. The toll will be most effective if the price elasticity of demand for the bridge is:
  - b. Elastic
11. If the price elasticity of demand for Baja Fresh tacos is 3.5, then Baja Fresh can:
  - e. Reduce the price of tacos and total revenue will increase.
12. Suppose that the market for some normal good is competitive and that incomes rise. If total expenditures on this good rise, then we know that
  - b. demand is price inelastic.

**Part 3: Numeric Solutions or Terms** (4 points each, 28 points total)

1. Terms:
  - c. A common measurement used by economists to gauge changes in a society's standard of living. *Per capita (real) GDP*
  - d. A good for which the income elasticity is greater than 1. *Luxury goods. Credit was given for obvious examples of luxury goods such as speedboats.*
2. Investment is the term economists use to describe expenditures on new productive facilities that enhance a society's capacity to produce. In a general sense, what is the opportunity cost of investment? *Foregone consumption. Credit was also given for answers dealing with "next best alternatives".*
3. Suppose that an activity,  $x$ , generates benefits according to a benefit function  $B(x) = 8x - 0.25x^2$  and

costs according to a cost function  $C(x) = 4x$ . What is the optimum level of this activity?

$$\frac{dB}{dx} = \frac{dC}{dx}$$

$$8 - 0.5x = 4$$

$$x = 8$$

4. If demand in a market is given by  $Q_d = 900 - 25P$  and supply is given by  $Q_s = 100 + 25P$ , describe the outcome if a price ceiling of 12 is imposed on the market. Be specific.

At  $P = 12$ ,  $Q_d = 600$  and  $Q_s = 400$ . Therefore there will be a shortage of 200 units.

5. Terms:

- c. What is the term for the view that government's role in the economy should be very limited?  
*Laissez faire*
- d. Monopolies, externalities, public goods, and asymmetric information are all categories of what general phenomenon? *Market failures*

6. Given a demand function:  $Q_{dx} = 400 - 100P_x - 50P_y + 0.01I$ , where
- $$\left\{ \begin{array}{l} Q_{dx} = \text{Quantity demand of good } x \\ P_x = \text{Price of good } x \\ P_y = \text{Price of related good } y \\ I = \text{Income of potential buyers} \end{array} \right.$$

- e. Are goods  $x$  and  $y$  substitutes or complements? *Complements*
- f. Is good  $x$  a normal or inferior good? *Normal good*

7. Suppose the price elasticity of gasoline is -0.2. Compute the change in total expenditures on gasoline if prices were to increase by 50%.

35% increase.  $\% \Delta Q = -10\%$ . Therefore, since  $TE = P * Q$ ,  $\% \Delta TE = +50\% - 10\% + [50\%] * (-10\%) =$