File: Ch02, Chapter 2: Supply and Demand Analysis

Multiple Choice

1. A relationship that shows the quantity of goods that consumers are willing to buy at different prices is the
   a) elasticity
   b) market demand curve
   c) market supply curve
   d) market equilibrium

Ans: B
Difficulty Level: Easy
Heading: Demand, Supply and Market Equilibrium
LO: 1

2. The law of demand states :
   a) that price and quantity demanded are inversely related.
   b) that price and quantity demanded are inversely related, holding all other factors that influence demand fixed.
   c) that demand for a good comes from the desire of buyers to directly consume the good itself.
   d) an increase in demand results in an increase in price.

Ans: B
Difficulty: Easy
Heading: Demand, Supply and Market Equilibrium
LO: 1

3. Which of the following statements best illustrates the law of demand?
   a) When the price of pepperoni rises, the demand for pizza falls.
   b) When the weather gets hotter, the quantity demanded of ice cream rises.
   c) When the price of lemons falls, the demand for lemonade rises.
   d) When the price of eggs rises, the quantity demanded of eggs falls.

Ans: D
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium

LO: 1

4. Which of the following is *not* typically a factor held constant when deriving a demand curve for clothing?
    a) consumer income.
    b) the price of clothing.
    c) the price of other goods.
    d) consumer tastes.

Ans: B
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 1

5. What is the difference between a derived demand curve and a direct demand curve?
    a) Derived demand is unknown, whereas direct demand is known.
    b) Derived demand is unobservable, whereas direct demand is observable.
    c) Derived demand is demand determined by the demand for another good, whereas direct demand is demand for a good itself.
    d) Derived and direct demand are both terms referring to the same thing.

Ans: C
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 2

6. What is the quantity of televisions demanded per year when the average price of a television is $100 per unit and the demand curve for televisions is represented by $Q^d = 3.5million - 5000P$?
    a) 2.5 million televisions
    b) 3.0 million televisions
    c) 3.2 million televisions
    d) 4.0 million televisions

Ans: B
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 1

7. The linear demand curve is represented by the equation
   a) $P=Q-aP$
   b) $Q=a-bP$
   c) $Q=a-bP^2$
   d) $Q = AP^{-b}$

Ans: B
Difficulty Level: Easy
Heading: Demand, Supply and Market Equilibrium
LO: 1

8. Which of the following statements best illustrates the law of supply?
   a) When the price of oil rises, the supply of automobiles falls.
   b) When the price of steel falls, the supply of automobiles rises.
   c) When the price of computers rises, the quantity supplied of computers rises.
   d) When the price of televisions rises, the quantity supplied of televisions falls.

Ans: C
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 1

9. A curve that shows us the total quantity of goods that their suppliers are willing to sell at different prices is
   a) Market supply curve
   b) Law of supply
   c) Demand curve
   d) Market demand curve

Ans: A
Difficulty Level: Easy
Heading: Demand, Supply and Market Equilibrium
LO: 1

10. Which of the following is *not* a factor held constant when deriving a supply curve for ski boots?
   a) The price of ski lift tickets.
   b) The price of ski boots.
   c) The wages of workers who make ski boots.

d) The price of skis.

Ans: B
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 1

11. Suppose in a market with $Q^d = 100 - 5P$ and $Q^s = 5P$, the government imposes a price floor of $15. If the government is required to purchase any excess supply at the price floor, how much will the government have to pay to purchase the excess in this market?
    a) Nothing; there is no surplus
    b) $1,000
    c) $1,500
    d) $750

Ans: D
Difficulty Level: Hard
Heading: Demand, Supply and Market Equilibrium
LO: 2

12. Suppose that the supply of apples can be represented by the following equation: $Q^s = 2P + 500$. Further suppose that the demand for apples can be represented by the following equation: $Q^d = 900 – 3P$. Which of the following is the equilibrium price in the market for apples?
    a) 10
    b) 50
    c) 80
    d) 100

Ans: C
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 1

13. Suppose demand is given by $Q^d = 500 – 15P$ and supply is given by $Q^s = 5P$. If the government imposes a $15 price ceiling the excess demand will be
    a) 200
    b) 225
    c) 250
    d) 275

Ans: A
Difficulty Level: Hard
Heading: Demand, Supply and Market Equilibrium
LO: 2

14. Suppose demand is given by $Q^d = 400 – 15P + I$, where Q^d is quantity demanded, P is price and I is income. Supply is given by $Q^s = 5P$, where Q^s is quantity supplied. When $I = 200$, equilibrium quantity is
    a) 15
    b) 20
    c) 25
    d) 30

Ans: D
Difficulty Level: Hard
Heading: Demand, Supply and Market Equilibrium
LO: 2

15. Suppose demand is given by $Q^d = 500 – 15P$ and supply is given by $Q^s = 5P$. If the government imposes a $30 price floor the excess supply will be
    a) 25
    b) 50
    c) 100
    d) 150

Ans: C
Difficulty Level: Hard
Heading: Demand, Supply and Market Equilibrium
LO: 2

16. Suppose demand is given by $Q^d = 400 – 15P + I$, where Q^d is quantity demanded, P is price and I is income. Supply is given by $Q^s = 5P$, where Q^s is quantity supplied. When $I = 100$, equilibrium quantity is
    a) 15
    b) 20
    c) 25
    d) 30

Ans: C

Difficulty Level: Hard
Heading: Demand, Supply and Market Equilibrium
LO: 2

17. Which of the following would cause an unambiguous decrease in the equilibrium quantity in a market?
    a) a rightward shift in supply and a rightward shift in demand.
    b) a rightward shift in supply and a leftward shift in demand.
    c) a leftward shift in supply and a rightward shift in demand.
    d) a leftward shift in supply and a leftward shift in demand.

Ans: D
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 2

18. Factors that could cause a supply curve to shift to the right include all of the following except
    a) a drop in the price of inputs to the supply process.
    b) an increase in the number of firms in the industry.
    c) an increase in demand for the product.
    d) a technological innovation that makes it cheaper to produce the product.

Ans: C
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 2

19. Factors that could cause a demand curve to shift to the left include all of the following except
    a) a change in preferences away from the product in question.
    b) an increase in the price of substitute products.
    c) a growing awareness of a health risk associated with the product.
    d) a decrease in the general level of income in the country.

Ans: B
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 2

20. Suppose that the market for computers is initially in equilibrium. Further suppose that there is an increase in the price of computer software. Which of the following accurately describes the new equilibrium in the computer market?
    a) The equilibrium price will rise; the equilibrium quantity will fall.
    b) The equilibrium price will rise; the equilibrium quantity will rise.
    c) The equilibrium price will fall; the equilibrium quantity will fall.
    d) The equilibrium price will fall; the equilibrium quantity will rise.

Ans: C
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 2

21. Suppose that the market for soybeans is initially in equilibrium. Further suppose that there is a decrease in the price of fertilizer. Which of the following accurately describes the new equilibrium?
    a) The equilibrium price will rise; the equilibrium quantity will fall.
    b) The equilibrium price will rise; the equilibrium quantity will rise.
    c) The equilibrium price will fall; the equilibrium quantity will fall.
    d) The equilibrium price will fall; the equilibrium quantity will rise.

Ans: D
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 2

22. Suppose that the market for newspaper is initially in equilibrium. Further suppose that there is both an increase in the price of ink and a decrease in the price of magazines, which people may read in place of a newspaper. Which of the following accurately describes the new equilibrium?
    a) The equilibrium price will rise; the equilibrium quantity is ambiguous.
    b) The equilibrium price is ambiguous; the equilibrium quantity will fall.
    c) The equilibrium price will fall; the equilibrium quantity is ambiguous.
    d) The equilibrium price is ambiguous; the equilibrium quantity will rise.

Ans: B
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 2

23. A higher consumer income increases the demand for a particular good. The effect of this income on market demand usually is illustrated by
    a) a rightward shift in the demand curve
    b) a leftward shift in the demand curve
    c) a rightward movement along the demand curve
    d) a leftward movement along the demand curve.

Ans: A
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 2

24. Consider the demand curve $Q^d = 1000 - 20P - 6r$. If the value of r falls, the demand curve will
    a) shift to the left
    b) shift to the right
    c) remain unchanged
    d) rotate along the quantity axis

Ans: B
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 2

25. Consider the demand curve $Q^d = 40 - 2P + 6i$. If the value of i rises, the demand curve will
    a) not shift at all
    b) shift to the right
    c) shift to the left
    d) rotate so it becomes upward sloping

Ans: B
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 2

26. Consider the supply curve $Q^s = 40 + 2P + 6i$. If the value of i rises, the supply curve will
    a) not shift at all

b) shift to the right
c) shift to the left
d) rotate so it becomes upward sloping

Ans: B
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 2

27. Which of the following would cause an unambiguous increase in the equilibrium price in a market?
a) a rightward shift in supply and a rightward shift in demand.
b) a rightward shift in supply and a leftward shift in demand.
c) a leftward shift in supply and a rightward shift in demand.
d) a leftward shift in supply and a leftward shift in demand.

Ans: C
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 2

28. A simultaneous shift to the right of both supply and demand will
a) increase the equilibrium price
b) decrease the equilibrium price
c) increase the equilibrium quantity
d) decrease the equilibrium quantity

Ans: C
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 2

29. Which of the following is False?
a) Rightward shift in demand + unchanged supply curve = higher equilibrium price and larger equilibrium quantity
b) Rightward shift in demand + Rightward shift in supply curve = lower equilibrium price and smaller equilibrium quantity
c) Leftward shift in supply + unchanged demand curve = higher equilibrium price and smaller equilibrium quantity

d) Leftward shift in demand + unchanged supply curve = lower equilibrium price and smaller equilibrium quantity
e) Rightward shift in supply + unchanged demand curve = lower equilibrium price and larger equilibrium quantity

Ans: B
Difficulty Level: Medium
Heading: Demand, Supply and Market Equilibrium
LO: 2

Short Answer

30. Suppose that demand and supply for cookies can be written as:
$Q^d = 50 - P$; $Q^s = P$. Compute the equilibrium price and quantity. Now, suppose that a change in the price of cake causes demand for cookies to become:
$Q^d = 100 - P$. Compute the new equilibrium price and quantity. What has changed?

Ans: The equilibrium price and quantity at the original levels of demand and supply can be computed as: $50 - P = P$ (setting demand equal to supply) so that $P^* = 25$. Turning now to equilibrium quantity: $Q = 50 - 25$ (Substituting P^* into the equation of demand) or $Q^* = 25$ (solving for equilibrium quantity, Q^*). With the new equation for demand, we can compute the new equilibrium price and quantity as follows: $100 - P = P$ (setting demand equal to supply) so that $P^{**} = 50$ (solving for the new equilibrium price, P^{**}) and: $Q = 100 - 50$ (substituting the new equilibrium price into the new demand) or $Q^{**} = 50$ (solving for the new equilibrium quantity, Q^{**}). There has been an outward shift in demand that has caused equilibrium price and quantity to rise as demand intersects supply farther to the north-east.
Response: Set demand equal to supply to get the equilibrium price and quantity in the two cases. Now, graph the problem. When demand shifts out, equilibrium price and quantity must rise. You can check that you have computed the equilibrium correctly by checking that the price and quantity you obtain satisfy both the demand and the supply equations.
Difficulty: Hard
Section: Demand, Supply and Market Equilibrium
LO: 2

31. Indicate whether each of the following events will shift the monthly demand curve for the Ford Taurus (a midsize car) to the right, to the left, or not at all: (a) GM introduces a new line of small, fuel-efficient cars; (b) Following an agreement between the US and Japan, Japanese car manufacturers will "voluntarily" reduce their exports of medium sized cars to the US; (c) The cost of steel increases.

Ans: (a) shifts demand to the left: at a given price for the Ford Taurus, some of its potential buyers will now purchase the new model; (b) shifts demand to the right: as the price of Japanese imports increases more people are willing to purchase US-made cars; (c) does not affect the demand curve.
Response: A demand shift to the left means that, at the same price, people would want to purchase fewer units or, equivalently, they would require a lower price to purchase at the level they were purchasing before. Factors affecting supply conditions (such as cost conditions) do not affect the desirability of the

product (at the same price). Notice that the price of steel is something that would affect the cost of producing a Taurus. This would affect the conditions of supply, but do not *in themselves* affect the desirability of the Taurus. You may think that an increase in cost may affect the price of the Taurus, which will change the amount demanded in the market price. This is a possible *equilibrium* outcome: as the supply conditions change, the supply curve shifts, changing the equilibrium price and, hence, the equilibrium number of cars traded.
Difficulty: Medium
Section: Demand, Supply and Market Equilibrium
LO: 2

Multiple Choice

32. A measure of the rate of percentage change of quantity demanded with respect to price, holding all other determinants of demand constant is
    a) Price elasticity of market equilibrium
    b) Price elasticity of demand
    c) Price elasticity of supply
    d) Price elasticity equilibrium

Ans: B
Difficulty Level: Easy
Heading: Price Elasticity of Demand
LO: 3

33. Price elasticity of demand measures
    a) the shift in demand as price changes.
    b) the sensitivity of quantity demanded to price.
    c) the slope of the demand curve.
    d) the relationship of percentages to price.

Ans: B
Difficulty Level: Easy
Heading: Price Elasticity of Demand
LO: 3

34. Consider the supply curve $Q^s = 2P$ and the demand curve $Q^d = 90 - P$. Which expression best shows how you would calculate the elasticity of demand when P increases by 1 along the demand curve from its equilibrium value?
    a) $[(59 - 60)/ (31 - 30)] \times (30/60)$

b) [(56 – 60)/ (31 – 30)] x (30/60)
c) [(59 – 61)/ (31 – 30)] x (30/60)
d) [(59 – 62)/ (32 – 30)] x (30/60)

Ans: A
Difficulty Level: Hard
Heading: Price Elasticity of Demand
LO: 3

35. Eggs would typically have a
a) low elasticity of demand, probably between -1 and -2
b) low elasticity of demand, probably between 0 and -1
c) high elasticity of demand , probably between -2 and -3
d) low elasticity of demand, probably between -2 and -3

Ans: B
Difficulty Level: Easy
Heading: Price Elasticity of Demand
LO: 6

36. Please match the classification to the meaning

a	Perfectly inelastic demand	1	Price elasticity of demand equal to -1
b	Inelastic demand	2	Price elasticity of demand between -1 and - ∞
c	Unitary elastic demand	3	Price elasticity of demand between 0 and -1
d	Elastic demand	4	Price elasticity of demand equal to 0
e	Perfectly elastic demand	5	Price elasticity of demand equal to - ∞

Ans: A – 4; B – 3; C – 1; D – 2; E – 5
Difficulty Level: Medium
Heading: Price Elasticity of Demand
LO: 3

37. Suppose that when the price of a good is $15, the quantity demanded is 40 units, and when the price falls to $6, the quantity increases to 60 units. The price elasticity of demand near a price of $6 and a quantity of 60 can be calculated as:
a) –5/6
b) –2
c) -2/9
d) –9/2

Ans: C
Difficulty Level: Medium
Heading: Price Elasticity of Demand
LO: 4

38. Suppose that demand is linear, $Q^d = 100 - 12P$. At P = 5 and Q = 40, price elasticity of demand is:
    a) -2/3
    b) –2
    c) -12
    d) –3/2

Ans: D
Difficulty Level: Medium
Heading: Price Elasticity of Demand
LO: 4

39. The choke price is
    a) the price at which quantity supplied falls to zero.
    b) the price at which quantity demanded falls to zero.
    c) the price at which quantity supplied is maximized.
    d) the price at which quantity demanded is maximized.

Ans: B
Difficulty Level: Easy
Heading: Price Elasticity of Demand
LO: 3

40. Suppose we postulate a linear demand curve $Q^d = a - bP$ and observe, through supply shifts, two points on the demand curve. At point A, $P_A = 2$ and $Q^d_A = 6$. At point B, $P_B = 4$ and $Q^d_B = 2$. The choke price for this demand curve is
    a) 10
    b) 2
    c) 5
    d) -2

Ans: A
Difficulty Level: Medium
Heading: Price Elasticity of Demand
LO: 4

41. Suppose demand is given by $Q^d = 1000 - 25P$ and supply is given by $Q^s = 75P$. At the equilibrium price and quantity, the price elasticity of demand is
    a) –3
    b) –25
    c) –1/3
    d) –10

Ans: C
Difficulty Level: Medium
Heading: Price Elasticity of Demand
LO: 4

42. Along a linear demand curve, as price falls
    a) The price elasticity of demand is constant, but the slope of demand falls.
    b) the price elasticity of demand approaches zero, but the slope is constant.
    c) the price elasticity of demand moves away from zero.
    d) the price elasticity is the same as the slope of the demand curve.

Ans: B
Difficulty Level: Medium
Heading: Price Elasticity of Demand
LO: 3

43. The constant elasticity demand curve is represented by the equation
    a) $P=Q-aP$
    b) $Q=a-bP$
    c) $Q=a-bP^2$
    d) $Q = AP^{-b}$

Ans: D
Difficulty Level: Easy
Heading: Price Elasticity of Demand
LO: 3

44. Consider the demand curve $Q^d = 5P^{-1}$. The elasticity of demand along this demand curve
    a) is inelastic
    b) is elastic

c) is unitary elastic
d) falls as the price falls

Ans: C
Difficulty Level: Medium
Heading: Price Elasticity of Demand
LO: 3

45. Consider the demand curve $Q^d = 500P^{-2}$. If the price is 1, the elasticity of demand is
a) –0.50
b) –2
c) 500
d) –500

Ans: B
Difficulty Level: Medium
Heading: Price Elasticity of Demand
LO: 3

46. If demand is elastic, an increase in price
a) will increase total revenue
b) will decrease total revenue
c) will have an indeterminate effect on total revenue
d) will decrease total profit

Ans: B
Difficulty Level: Easy
Heading: Price Elasticity of Demand
LO: 3

47. Of the following choices, which good should have the most inelastic price elasticity of demand?
a) Gasoline to a car owner.
b) Cigarettes to a smoker.
c) Insulin to an insulin-dependent diabetic.
d) Apples to a vegetarian.

Ans: C
Difficulty Level: Medium
Heading: Price Elasticity of Demand

LO: 3

48. Identify the truthfulness of the following statements.
I. Demand tends to be more price inelastic when few substitutes for a product exist.
II. Demand tends to be more price elastic when a consumer's expenditure on the product is small.

a) Both I and II are true.
b) Both I and II are false.
c) I is true; II is false.
d) I is false; II is true.

Ans: C
Difficulty Level: Medium
Heading: Price Elasticity of Demand
LO: 4

Short Answer

49. What is the elasticity of the following demand curve? $QP^2 = 100$

Ans: $\varepsilon_{Q,P} = -2$.
Response: This is a constant elasticity demand curve. Rewriting the demand, we have $Q = 10P^{-2}$ so that the elasticity is given by -2.
Difficulty: Medium
Section: Price Elasticity of Demand
LO: 4

50. Suppose that the government wishes to encourage the manufacture and sale of small cars. The current supply and demand of small cars are: $Q^s = -(10/9) + (1/9)P$; $Q^d = 100 – P$, where Q is in millions of cars and P is in hundreds of dollars. What is the current equilibrium price and quantity of cars sold? Now, suppose that the government is considering two alternative plans for encouraging small car sales. Under Plan A, every car manufacturer will receive a $500 rebate from the government for each car sold. Under plan B, every purchaser of a small car will receive a $500 rebate from the government. Which plan, A or B, is more effective? Why?

Ans: At the original market equilibrium the quantity demanded must be equal to the quantity supplied, i.e. $–(10/9) +(1/9)P = 100 – P$, implying that P = 91. Plugging this value of P in the demand curve gives us the equilibrium quantity $Q = 100 – 91 = 9$. Alternatively we could also use the equilibrium value of P in the equation for the supply curve to get $Q = -(10/9) + 91/9 = 81/9 = 9$. Under the plans proposed by the

government, we must now distinguish between P^d, the price paid by consumers, and P^s, the price collected by sellers. The demand and supply curves can be rewritten as $Q^s = -(10/9) + (1/9)P^s$ and $Q^d = 100 – P^d$. Since car manufacturers receive $500 from the government for every car they sell, the price they receive is higher than the price paid by consumers by $500. Since the prices are expressed in hundreds of dollars, this means that $P^s = P^d + 5$. Using this relationship we can now rewrite the supply curves in terms of P^d as $Q^s = -(10/9) + (1/9)(P^d + 5) = -(5/9) + (1/9) P^d$. Hence, if we draw both supply and demand curves in terms of P^d, the rebate paid to the manufacturer shifts their supply curve down by 5. This is as expected. What determines the number of cars that manufacturers are willing to sell is the total amount of money that they get for each car. Since they are getting 5 from the government, they are willing to supply the same number of cars as before if they get exactly 5 less from the consumers. We can then determine the price paid by consumers in the new equilibrium by setting Q^s equal to Q^d i.e. $100 – P^d = -(5/9) + (1/9) P^d$ so that we get $P^d = 90.5$, $P^s = 90.5 + 5 = 95.5$ and $Q = 100 – 90.5 = 9.5$. Compared to the situation in (a), consumers pay 0.5 (i.e. $50) less per car and sellers get $P^s = 90.5 + 5 = 95.5$, i.e. they get $450 more per car. In other words, 10 % of the rebate offered to the manufacturer has been passed on to consumers. Under plan B, since the rebate now goes to buyers we have $P^d = P^s – 5$ where P^d is the amount of money buyers effectively pay to buy a car. Hence we can write the demand curve in terms of P^s as $Q^d = 100 – (P^s - 5) = 105 – P^s$. Intuitively, the rebate of 5 has shifted market demand up by 5 (to D') because it has increased consumers' willingness to pay for a car by 5. Equating the quantities demanded and supplied we have $105 – P^s = -(10/9) + (1/9) P^s$ so that $P^s = 95.5$, $P^d = 90.5$ and $Q = 100 – 90.5 = 9.5$. Under both plans, car sales increase by 500,000 cars. Since the goal of the government is to increase the sales of small cars, both plans can be said to be equally effective.
Response: Recall that the equilibrium is where Q^s equals Q^d. You need to conduct this exercise in each case. Under the government plan, however, manufacturers are receiving $5 more per unit than they were before (since prices are measured in 100's in this problem). Hence, $P^s = P^d + 5$. Demanders are paying the same as before. Hence, now the price in the supply equation is greater than the price in the demand equation. Using P^s in supply and P^d in demand, we can calculate the equilibrium price paid by consumers, P^d by substituting $P^s = P^d + 5$ into supply and solving.
Difficulty: Hard
Section: Price Elasticity of Demand
LO: 6

51. The following equations represent *demand curves* for a commodity, q: (i) q = 100 - p; (ii) q = 10 + p; (iii) q = 50. For each of these demands, calculate the choke price, the slope, and the price elasticities of demand in the neighborhood of q = 100 and q = 50.

Ans: the choke price for demand (i) is 100 since 0 = 100 – 100. For demands (ii) and (iii), there is no price at which quantity demanded is zero. The slope of demand (i) is –10 (the coefficient of price). The slope of demand (ii) is 1, and the slope of demand (iii) is zero. (Notice that, when we graph demand, we usually put price on the vertical axis, so that the slope in the graph would be the coefficient of output.) The elasticities are the following at 100: (i) $\varepsilon_{Q,P} = (\Delta Q/\Delta P)(P/Q) = (-1/1)(0/100) = 0$, (ii) $\varepsilon_{Q,P} = (\Delta Q/\Delta P)(P/Q) = (1/1)(110/100) = 1.1$; (iii) $\varepsilon_{Q,P} = (\Delta Q/\Delta P)(P/Q)$ = undefined for q not equal to 50. At 50 we have: (i) $\varepsilon_{Q,P} = (\Delta Q/\Delta P)(P/Q) = (-1/1)(50/50) = -1$; (ii) $\varepsilon_{Q,P} = (\Delta Q/\Delta P)(P/Q) = (1/1)(40/50) = .8$; (iii) $\varepsilon_{Q,P} = (\Delta Q/\Delta P)(P/Q) = 0$ (since the change in quantity is zero for any price).
Response: Recall that the choke price is the price for which demand is zero. The slope of demand calculated algebraically is the coefficient of price. Elasticity for this problem is defined as $\varepsilon_{Q,P} = (\Delta Q/\Delta P)(P/Q)$. Graph the demands in order to get an idea of the choke price. Notice that demand (c) is vertical: there is no intersection of demand with the vertical axis. Hence, there is no choke price. Notice that the slope of demand is different if you read it off the graph than if you calculate it. This is because

we tend to graph demand with price on the vertical axis and output on the horizontal axis (in other words, we graph demand as if P were on the left hand side of the equation and Q were on the right hand side). The graph is, to be precise, a picture of inverse demand. This question asks you for the slope of demand. This is $\Delta Q/\Delta P$. The price elasticity in the neighborhood of q = 100 must have q = 100 substituted into the demand equation so that we can calculate the corresponding price.
Difficulty: Hard
Section: Price Elasticity of Demand
LO: 4

52. The current price in the market for bananas is $0.10 per pound. At this price, 1 million pounds are sold per year in Small-town, U.S.A. Suppose that the price elasticity of demand is -5 and the short run price elasticity of supply is 0.05. Solve for the equations of demand and supply, assuming that demand and supply are linear.

Ans: We will express quantities in millions of pounds and the price in dollars.
The equation for demand is $Q = A – BP$ and the equation for supply is $Q = C + DP$. The current market equilibrium is Q = 1 and P = 0.1. Since the equilibrium lies on both the demand and the supply curve, this implies that $1 = A – 0.1B$ and $1 = C + 0.1D$ or, equivalently that $A = 1 + 0.1B$ and $C = 1 – 0.1D$. At the market equilibrium we also know that $P/Q = 0.1/1 = 0.1$ so that the elasticity of demand can be written as $(\Delta Q/\Delta P)(P/Q) = -0.1B$ and the elasticity of supply can be written as $(\Delta Q/\Delta P)(P/Q) = 0.1D$. Since the elasticity of demand is equal to –5 we have $–0.1B = -5$ or $B = 50$ and $A = 1 + (0.1)(50) = 6$. As the elasticity of supply is equal to 0.05 we have $0.1D = 0.05$ or $D = .5$ and $C = 1 – (0.1)(.5) = 0.95$. Hence the equation of demand is $Q = 6 – 50P$ and the equation of supply is $Q = 0.95 + .5P$. As a check, setting the quantity supplied equal to the quantity demanded one immediately recovers the equilibrium price P = 0.1.
Response: The equation for demand can be written $Q = A - BP$ and the equation for supply can be written $Q = C + DP$. The current market equilibrium is Q = 1 and P = 0.4, if we express quantities in millions of pounds and the price in dollars. Equilibrium lies on both the demand and the supply curve, implying that $1 = A - .1B$ and $1 = C + .1D$. Now, use the equation for elasticity in terms of slopes to calculate values for the parameters of demand and supply.
Difficulty: Hard
Section: Price Elasticity of Demand
LO: 4

Multiple Choice

53. An income elasticity of demand for milk of 0.1 could mean that
   e) as income rises by 10 percent, quantity demanded rises by 1 percent.
   f) as income rises by 100 percent, quantity demanded rises by 1 percent.
   g) as income rises by 20 percent, quantity demanded rises by 10 percent.
   h) as income rises by 50 percent, quantity demanded rises by 25 percent.

Ans: A
Difficulty Level: Medium

Heading: Other Elasticities
LO: 8

54. Income elasticity of demand measures the responsiveness of quantity demanded to changes in
    a) price.
    b) income.
    c) demand substitutes.
    d) demand complements.

Ans: B
Difficulty Level: Easy
Heading: Other Elasticities
LO: 8

55. A cross price elasticity of demand for product *A* with respect to the price of product *B* of 0.3 means that
    a) an increase in the price of A by 10 percent gives rise to an increase in quantity demanded of B by 3 percent.
    b) an increase in the price of B by 10 percent gives rise to an increase in the quantity demanded of A by 3 percent.
    c) an increase in the price of B by 10 percent gives rise to a decrease in the quantity demanded of A by 3 percent.
    d) an increase in the price of A by 10 percent gives rise to a decrease in the quantity demanded of B by 3 percent.

Ans: B
Difficulty: Medium
Heading: Other Elasticities
LO: 8

56. Suppose the cross-price elasticity for two goods is negative. The two goods are
    a) normal goods
    b) substitutes
    c) complements
    d) inferior goods

Ans: C
Difficulty Level: Easy
Heading: Other Elasticities

LO: 8

57. Which of the following statements is true?
    a) The price elasticity of demand is positive when there is an inverse relationship between price and quantity demanded.
    b) A positive income elasticity indicates that demand for a good rises as consumer income falls.
    c) A positive cross-price elasticity for two goods A and B would arise if A and B were demand complements.
    d) A negative cross-price elasticity for two goods A and B would arise if A and B were demand complements.

Ans: D
Difficulty Level: Medium
Heading: Other Elasticities
LO: 8

58. Suppose the cross-price elasticity for two goods is positive. The two goods are
    a) normal goods
    b) substitutes
    c) complements
    d) inferior goods

Ans: B
Difficulty Level: Easy
Heading: Other Elasticities
LO: 8

59. All else equal, an increase in the price of bicycle helmets, would tend to
    a) reduce the demand for cars
    b) increase the demand for bicycles
    c) reduce the demand for bicycles
    d) cause more riders to walk to work.

Ans: C
Difficulty Level: Easy
Heading: Other Elasticities
LO: 8

60. Why are long-run demand curves likely to be more elastic than short-run demand curves?
    a) Prices tend to rise in the long-run.
    b) Prices tend to be stable in the long-run.
    c) Consumers have more time to adjust their purchase decisions in response to a change in price.
    d) Supply tends to adjust in the long run.

Ans: C
Difficulty Level: Easy
Heading: Elasticity in the Long Run Versus the Short Run
LO: 9

61. Which of the following statements best describes the relationship between short-run supply elasticity and long-run supply elasticity?
    a) For many products, long-run supply is likely to be more price elastic than short-run supply.
    b) For products that can be recycled, long-run supply is likely to be more price elastic than short-run supply.
    c) For many products, long-run supply is likely to be less price elastic than short-run supply.
    d) Both a) and b) are generally true, but c) is generally false.

Ans: A
Difficulty Level: Medium
Heading: Elasticity in the Long Run Versus the Short Run
LO: 9

62. Gasoline in the long run will generally exhibit
    a) greater elasticity of demand than in the short run.
    b) greater elasticity of demand that for jewelry.
    c) less elasticity of demand than in the short run.
    d) less elasticity of demand than with regard to insulin for diabetics.

Ans: A
Difficulty Level: Easy
Heading: Elasticity in the Long Run Versus the Short Run
LO: 9

63. Which of the following statements best describes the relationship between short-run demand elasticity and long-run demand elasticity?
    a) For many products, long-run demand is likely to be more price elastic than short-run demand.
    b) For durable goods, long-run demand is likely to be more price elastic than short-run demand.
    c) For many products, long-run demand is likely to be more price inelastic than short-run demand.
    d) For most products, long-run and short-run demand elasticities are the same.

Ans: A
Difficulty Level: Easy
Heading: Elasticity in the Long Run Versus the Short Run
LO: 9

64. Which of the following explanations supports the statement that long-run supply curves are likely to be more elastic than short-run supply curves?
    a) Firms are able to adjust fixed inputs in the long-run but not in the short-run.
    b) Firms are able to adjust variable inputs in the short-run.
    c) Firms prefer to hire workers rather than capital.
    d) Firms have more flexibility in the short-run.

Ans: A
Difficulty Level: Medium
Heading: Elasticity in the Long Run Versus the Short Run
LO: 9

65. Let the price elasticity of demand for a soft drink be – 2. In the year 2005, the per capita consumption of soft drinks was about 500 cans per person, and the average price was $1.00 per can. If we suppose that demand for the soft drink is linear, $Q^d = a - bP$, where a and b are constants, Q^d is quantity demanded and P is price, an estimate of the demand equation could be:
    a) $Q^d = 100 - 2P$
    b) $Q^d = 1500 - 2P$
    c) $Q^d = 1500 - 1000P$
    d) $Q^d = 1000 - 1500P$

Ans: C
Difficulty Level: Hard
Heading: Back-of-the-Envelope Calculations
LO: 10

66. To identify a demand curve we must observe
    a) many years of data
    b) shifts in the demand curve
    c) shifts in the supply curve
    d) many different markets simultaneously

Ans: C
Difficulty Level: Medium
Heading: Back-of-the-Envelope Calculations
LO: 10

67. Consider the following demand and supply curves: $Q^d = 100 – 2P$, and $Q^s = ½ P$, calculate the equilibrium P and Q for this initial situation and assuming the supply curve changes to $Q^s = ½ P + 10$. Which of the following is correct?
    a) the initial equilibrium is P = 40, Q = 20 and the supply curve shifts left.
    b) the initial equilibrium is P = 40, Q = 20 and the new equilibrium is P = 36, Q = 28.
    c) the initial equilibrium is P = 40, Q = 20 and the new equilibrium remains the same.
    d) the initial equilibrium is P = 40, Q = 20 and the new equilibrium is P = 38, Q = 28.

Ans: B
Difficulty Level: Hard
Heading: Back-of-the-Envelope Calculations
LO: 10

68. Consider the following demand and supply curves: $Q^d = 100 – 2P$, and $Q^s = ½ P$, calculate the equilibrium P and Q for this initial situation and assuming the demand curve changes to $Q^s = 100 - P$. Which of the following is correct?
    a) the initial equilibrium is P = 40, Q = 20 and the demand curve shifts left.
    b) the initial equilibrium is P = 40, Q = 20 and the new equilibrium is P = 36, Q = 28.
    c) the initial equilibrium is P = 40, Q = 20 and the new equilibrium is P = 66 2/3 and Q = 33 1/3.
    d) the initial equilibrium is P = 40, Q = 20 and the demand curve shifts right.

Ans: C
Difficulty Level: Hard
Heading: Back-of-the-Envelope Calculations

LO: 10

69. Suppose that demand and supply in the market for brazil nuts is linear, with a historic market price of $.50 per pound and 10 million pounds sold. In 2004, a news item raised health fears about the nuts. That year, the market price fell to $.45 per pound and only 8 million pounds traded. An estimate for the equation of brazil nuts would be:
    a) This information only relates to demand, and so cannot be used to generate a supply equation.
    b) $Q^s = 30 + 40P$
    c) $Q^s = 40P$
    d) $Q^s = -10+40P$

Ans: D
Difficulty Level: Hard
Heading: Back-of-the-Envelope Calculations
LO: 10