Chapter 2: Demand Theory

MULTIPLE CHOICE

1. The market demand schedule shows the quantities that would be purchased, holding all other factors constant, from a group of firms during a given time period:
   a. at varying prices.
   b. at varying advertising levels.
   c. at varying competitors' prices and advertising levels.
   d. at varying prices and advertising levels.
   e. over different time intervals.

   ANS: A DIF: Easy REF: 29 TOP: Demand Theory
   MSC: Factual

2. Information on the quantities that would be purchased at different prices, holding all other factors constant, in a given time period from a group of firms is shown in a:
   a. firm demand curve.
   b. market demand curve.
   c. firm demand schedule.
   d. market supply schedule.
   e. firm supply curve.

   ANS: B DIF: Easy REF: 29 TOP: Demand Theory
   MSC: Factual

3. A graphical representation of the demand function is called a:
   a. demand schedule.
   b. demand curve.
   c. demand function.
   d. marginal revenue schedule.
   e. marginal revenue curve.

   ANS: B DIF: Easy REF: 29 TOP: Demand Theory
   MSC: Factual

4. The demand curve's usual slope implies that consumers:
   a. buy more as the price of a good is increased.
   b. buy more as a good is advertised more.
   c. buy more at higher average incomes.
   d. buy less as the price of a good is increased.
   e. have tastes that sometimes change.

   ANS: D DIF: Easy REF: 29 TOP: Demand Theory
   MSC: Factual

5. A market demand curve is likely to shift to the right when:
   a. average income falls.
   b. prices fall.
   c. prices rise.
   d. population increases.
   e. new firms enter the market.

ANS: D DIF: Easy REF: 31 TOP: Demand Theory
MSC: Factual

6. A firm's demand curve is usually:
   a. to the right of the market demand curve.
   b. more inelastic than the market demand curve.
   c. the same as the market demand curve.
   d. drawn holding supply constant.
   e. more elastic than the market demand curve.

   ANS: E DIF: Moderate REF: 33 TOP: Demand Theory
   MSC: Conceptual

7. The price elasticity of demand can be interpreted as the:
   a. percentage change in the quantity demanded divided by the percentage change in the good's price.
   b. percentage change in the quantity demanded divided by the percentage change in a substitute good's price.
   c. percentage change in the good's price divided by the percentage change in quantity demanded.
   d. change in the quantity demanded of a good divided by the change in its price.
   e. change in the quantity demanded of a good divided by the change in a related good's price.

   ANS: A DIF: Easy REF: 36
   TOP: Calculate the Price Elasticity of Demand MSC: Factual

8. In the article "Colombia, Brazil Advance Proposal to Withhold 10 Percent of Export Output" (*The Wall Street Journal*, September 23, 1991, p. B6), a Colombian delegate to the International Coffee Organization said that if all its members withheld 10% of export output, the international price would rise 20%. This statement implies that the price elasticity of demand for coffee is approximately:
   a. –0.00.
   b. –5.00.
   c. –2.00.
   d. –0.20.
   e. –0.50.

   ANS: E DIF: Moderate REF: 36
   TOP: Calculate the Price Elasticity of Demand MSC: Applied

9. If the elasticity of per capita demand with respect to population is zero, then a 10% increase in the population will cause the quantity demanded to:
   a. increase by 25%.
   b. decrease by 10%.
   c. remain constant.
   d. increase by 10%.
   e. decrease by 25%.

   ANS: C DIF: Easy REF: 36
   TOP: The Own-Price Elasticity of Demand MSC: Applied

10. As we move down a linear demand curve, demand becomes:

a. more elastic.
b. less elastic at first and then more elastic.
c. steeper.
d. more elastic at first and then less elastic.
e. less elastic.

ANS: E DIF: Easy REF: 37
TOP: Calculate the Price Elasticity of Demand MSC: Factual

11. The formula for the arc price elasticity can be written (where ΔQ denotes the change in Q) as:
a. $\eta = [\Delta Q /(Q_1 + Q_2)]/[\Delta P/(P_1 + P_2)]$.
b. $\eta = [\Delta Q /(Q_1 + Q_2)]/[\Delta P/(Q_1 + Q_2)]$.
c. $\eta = [\Delta Q /(P_1 + P_2)]/[\Delta P/(Q_1 + Q_2)]$.
d. $\eta = [\Delta P /(P_1 + P_2)]/[\Delta Q/(Q_1 + Q_2)]$.
e. none of the above.

ANS: A DIF: Easy REF: 39
TOP: Calculate the Price Elasticity of Demand MSC: Factual

12. The formula for the point price elasticity can be written as:
a. $\eta = (\Delta Q / \Delta P)(P / Q)$.
b. $\eta = (\Delta P / \Delta Q)(P / Q)$.
c. $\eta = (\Delta Q / \Delta P)(Q / P)$.
d. $\eta = (\Delta P / \Delta Q)(Q / P)$.
e. none of the above.

ANS: A DIF: Easy REF: 39
TOP: Calculate the Price Elasticity of Demand MSC: Factual

13. The formula for the arc elasticity of demand can be written as:
a. $\eta_{XY} = [\Delta Q_X /(Q^1_X + Q^2_X)]/[\Delta P_X/(P^1_X + P^2_X)]$.
b. $\eta_{XY} = [\Delta Q_X /(Q^1_Y + Q^2_Y)]/[\Delta P_Y/(P^1_X + P^2_X)]$.
c. $\eta_{XY} = [\Delta Q_X /(Q^1_X + Q^2_X)]/[\Delta P_Y/(P^1_Y + P^2_Y)]$.
d. $\eta_{XY} = [\Delta P_X /(P^1_X + P^2_X)]/[\Delta Q_Y/(Q^1_Y + Q^2_Y)]$.
e. none of the above.

ANS: C DIF: Easy REF: 39
TOP: Calculate the Price Elasticity of Demand MSC: Factual

14. The demand for office chairs in thousands is $Q = 80 – P^2$. At a price of \$4, the price elasticity of demand is:
a. –0.5.
b. –8.0.
c. –2.0.
d. –4.0.
e. –0.25.

ANS: A DIF: Easy REF: 40
TOP: Calculate the Price Elasticity of Demand MSC: Applied

15. The demand for cough medicine is $Q = 10 – 2P$. At a price of \$2.50, the price elasticity of demand is:
a. –2.0.

b. –1.0.
c. –2.5.
d. –0.4.
e. –1.5.

ANS: B DIF: Easy REF: 40
TOP: Calculate the Price Elasticity of Demand MSC: Applied

16. The demand for answering machines is $Q = 1{,}000 - 150P + 25I$. Assume that per capita disposable income I is \$200. When the price of answering machines is $P = \$10$, the price elasticity of demand is:
a. –3.0.
b. –3.33.
c. –1.33.
d. –0.33.
e. –1.0.

ANS: D DIF: Easy REF: 40
TOP: Calculate the Price Elasticity of Demand MSC: Applied

17. The demand for personal computers has been estimated to be $Q = 500{,}000 - 700P + 200I - 500S$. Assume that per capita income I is \$13,000 and the average price of software S is \$400. When the price of personal computers is $P = \$3{,}000$, the price elasticity of demand is:
a. –2.625.
b. –7.0.
c. –1.0.
d. –21.0.
e. –4.25.

ANS: A DIF: Moderate REF: 40
TOP: Calculate the Price Elasticity of Demand MSC: Applied

18. A manufacturer of infant clothes has found that the demand for its product is given by

$Q = 100P^{\pm 1.25}A^{0.5}$, where P is price and A is advertising expenditures. The price elasticity of demand for these infant clothes is:
a. –0.8.
b. –1.25.
c. –1.0.
d. –2.5.
e. –0.5.

ANS: B DIF: Moderate REF: 40
TOP: Calculate the Price Elasticity of Demand MSC: Applied

19. The demand for textbooks is $Q = 200 - P + 25U - 50P_{beer}$. Assume that the unemployment rate U is 8 and the price of beer P_{beer} is \$2. When the average price of a textbook is $P = \$100$, the price elasticity of demand is:
a. –1.0.
b. –2.0.
c. –0.5.
d. –50.
e. –5.0.

ANS: C DIF: Moderate REF: 40

TOP: Calculate the Price Elasticity of Demand MSC: Applied

20. Suppose that the demand curve for compact disks is given by $P = 600 – Q$ and that the supply curve is given by $P = 0.5Q$, where Q is the quantity of compact disks and P is their price. What is the price elasticity of demand at the equilibrium price and quantity?
a. –0.05.
b. –0.02.
c. –0.20.
d. –0.50.
e. –2.00.

ANS: D DIF: Moderate REF: 40
TOP: Calculate the Price Elasticity of Demand MSC: Applied

21. The demand for fashion watches is $Q = 9 – 0.7P + 2I$. Assume that per capita income I is \$13. When the price of fashion watches is $P = \$30$, the price elasticity of demand is:
a. –0.66.
b. –1.0.
c. –2.0.
d. –0.5.
e. –1.5.

ANS: E DIF: Moderate REF: 40
TOP: Calculate the Price Elasticity of Demand MSC: Applied

22. The demand for fax machines in thousands of units has been estimated to be $Q = 1{,}000 – 1.5P + 5L$, where P is the price of the machines and L is the average cost of a 10-minute midday call from Los Angeles to New York. At a fax machine price of \$400 and a phone call cost of \$10, the price elasticity of demand for fax machines is:
a. –4.0.
b. –2.50.
c. –0.61.
d. –0.25.
e. –1.33.

ANS: E DIF: Moderate REF: 40
TOP: Calculate the Price Elasticity of Demand MSC: Applied

23. The demand for space heaters is $Q = 250 – P + 2\text{COOL}$, where COOL is the absolute value of the difference between the average overnight low temperature and 40°F. Assume that the average overnight low is 0°F. When the price of space heaters is $P = \$30$, the price elasticity of demand is:
a. –0.1.
b. –1.0.
c. –0.66.
d. –1.5.
e. –6.6.

ANS: A DIF: Difficult REF: 40
TOP: Calculate the Price Elasticity of Demand MSC: Applied

24. The demand for space heaters is $Q = 250 - P + 2\text{COOL}$, where COOL is the absolute value of the difference between the average overnight low temperature and 40°F. Assume that the average overnight low this month is 40°F. When the price of space heaters is $P = \$50$, the price elasticity of demand is:
    a. –1.38.
    b. –13.8.
    c. –0.138.
    d. –1.50.
    e. –0.25.

    ANS: E DIF: Difficult REF: 40
    TOP: Calculate the Price Elasticity of Demand MSC: Applied

25. The price elasticity of market demand primarily depends on the:
    a. number of firms in an industry.
    b. cost of producing an industry's output.
    c. availability of substitutes.
    d. substitutability of inputs in producing a product.
    e. supply curves of inputs.

    ANS: C DIF: Moderate REF: 44
    TOP: Calculate the Price Elasticity of Demand MSC: Factual

26. El Niño wind patterns affected the weather across the United States during the winter of 1997–1998. Suppose the demand for home heating oil in Connecticut is given by $Q = 20 - 2P_{hho} + 0.5P_{ng} - \text{TEMP}$, where Q is the quantity of home heating oil demanded, P_{hho} is the price of home heating oil per unit, P_{ng} is the price of natural gas per unit, and TEMP is the absolute difference between the average winter temperature over the past 10 years and the current average winter temperature. If the current price of home heating oil is \$1.20, the current price of natural gas is \$2.00, and the average winter temperature this year is 40 degrees compared to 28 degrees over the past 10 years, the quantity of home heating oil demanded is:
    a. 6.6 gallons.
    b. 16.6 gallons.
    c. 35.4 gallons.
    d. 20 gallons.
    e. none of the above.

    ANS: A DIF: Difficult REF: 44
    TOP: Calculate the Price Elasticity of Demand MSC: Applied

27. El Niño wind patterns affected the weather across the United States during the winter of 1997–1998. Suppose the demand for home heating oil in Connecticut is given by $Q = 20 - 2P_{hho} + 0.5P_{ng} - \text{TEMP}$, where Q is the quantity of home heating oil demanded, P_{hho} is the price of home heating oil per unit, P_{ng} is the price of natural gas per unit, and TEMP is the absolute difference between the average winter temperature over the past 10 years and the current average winter temperature. If the current price of home heating oil is \$1.20, the current price of natural gas is \$2.00, and the average winter temperature this year is 40 degrees compared to 28 degrees over the past 10 years, the TEMP variable tells us that:
    a. each 1-degree increase in temperature over the normal average raises home heating oil sales by 1 unit.
    b. each 1-degree increase in temperature over the normal average lowers home heating oil sales by 1 unit.
    c. the average daily temperature has no impact on the sales of home heating oil.
    d. the average daily temperature has an impact only on the sales of natural gas.

e. price elasticity of demand for home heating oil is 2.

ANS: B DIF: Difficult REF: 44
TOP: Calculate the Price Elasticity of Demand MSC: Applied

28. El Niño wind patterns affected the weather across the United States during the winter of 1997–1998. Suppose the demand for home heating oil in Connecticut is given by $Q = 20 - 2P_{hho} + 0.5P_{ng} - \text{TEMP}$, where Q is the quantity of home heating oil demanded, P_{hho} is the price of home heating oil per unit, P_{ng} is the price of natural gas per unit, and TEMP is the absolute difference between the average winter temperature over the past 10 years and the current average winter temperature. If the current price of home heating oil is $1.20, the current price of natural gas is $2.00, and the average winter temperature this year is 40 degrees compared to 28 degrees over the past 10 years, the price elasticity of demand for home heating oil is:
a. –0.09.
b. –0.36.
c. –1.2.
d. –2.
e. none of the above.

ANS: B DIF: Difficult REF: 44
TOP: Calculate the Price Elasticity of Demand MSC: Applied

29. El Niño wind patterns affected the weather across the United States during the winter of 1997–1998. Suppose the demand for home heating oil in Connecticut is given by $Q = 20 - 2P_{hho} + 0.5P_{ng} - \text{TEMP}$, where Q is the quantity of home heating oil demanded, P_{hho} is the price of home heating oil per unit, P_{ng} is the price of natural gas per unit, and TEMP is the absolute difference between the average winter temperature over the past 10 years and the current average winter temperature. If the current price of home heating oil is $1.20, the current price of natural gas is $2.00, and the average winter temperature this year is 40 degrees compared to 28 degrees over the past 10 years, if the sellers of home heating oil are profit maximizers, they should:
a. lower prices.
b. raise prices.
c. advertise more.
d. advertise less.
e. none of the above

ANS: B DIF: Difficult REF: 44
TOP: Calculate the Price Elasticity of Demand MSC: Conceptual

30. The demand for a product is more elastic the:
a. more broadly the product is defined.
b. longer the time period covered.
c. higher the average income of consumers.
d. smaller the share of a consumer's income the item represents.
e. larger the number of firms in the market.

ANS: B DIF: Easy REF: 45
TOP: Calculate the Price Elasticity of Demand MSC: Factual

31. The demand for a product is more inelastic:
a. the more narrowly defined the product.
b. the longer the time period covered.
c. the lower the average income of consumers.

d. the better the available substitutes.
e. the poorer the available substitutes.

ANS: E DIF: Easy REF: 45
TOP: Calculate the Price Elasticity of Demand MSC: Factual

32. The demand for costume jewelry has been estimated to be $Q = 100P^{-2}E^2$, where E is the price of real gem jewelry. Costume jewelry and real gem jewelry are:
a. substitute goods.
b. complement goods.
c. inferior goods.
d. normal goods.
e. unrelated goods.

ANS: A DIF: Moderate REF: 45
TOP: Calculate the Price Elasticity of Demand MSC: Applied

33. Marginal revenue can be defined as the:
a. percent increase in total revenue resulting from a 1% increase in output.
b. increase in total revenue resulting from a 1-unit increase in output.
c. total revenue divided by output.
d. average revenue multiplied by output.
e. average revenue multiplied by output divided by 4.

ANS: B DIF: Easy REF: 48
TOP: Total Revenue, Marginal Revenue, and Price Elasticity MSC: Factual

34. Total revenue can be defined as:
a. average revenue multiplied by marginal revenue.
b. average revenue divided by marginal revenue.
c. average revenue multiplied by output.
d. average revenue divided by output.
e. marginal revenue divided by output.

ANS: C DIF: Easy REF: 48
TOP: Total Revenue, Marginal Revenue, and Price Elasticity MSC: Factual

35. Marginal revenue can be defined in terms of price (P) and elasticity ($ç$) as:
a. $MR = \mathrm{P}(\eta + 1/\eta)$.
b. $P = MR(1/\eta)$.
c. $MR = P\eta$.
d. $MR = P(1 + 1/\eta)$.
e. $P = MR(1 - 1/\eta)$.

ANS: D DIF: Easy REF: 48
TOP: Total Revenue, Marginal Revenue, and Price Elasticity MSC: Factual

36. If price is $25 when the price elasticity of demand is –0.5, then marginal revenue must be:
a. $50.
b. –$25.
c. $12.50.
d. $37.50.
e. $25.

ANS: B DIF: Easy REF: 48
TOP: Total Revenue, Marginal Revenue, and Price Elasticity MSC: Applied

37. If price is $12 when the price elasticity of demand is –1, then marginal revenue must be:
    a. $24.
    b. $18.
    c. $12.
    d. $6.
    e. $0.

ANS: E DIF: Easy REF: 48
TOP: Total Revenue, Marginal Revenue, and Price Elasticity MSC: Applied

38. Total revenue decreases as output increases whenever:
    a. marginal revenue is less than average revenue.
    b. marginal revenue is greater than average revenue.
    c. average revenue is decreasing.
    d. marginal revenue is negative.
    e. average revenue is negative.

ANS: D DIF: Easy REF: 51
TOP: Total Revenue, Marginal Revenue, and Price Elasticity MSC: Conceptual

39. Total revenue is rising with increases in output whenever:
    a. output increases.
    b. marginal revenue is positive.
    c. average revenue is positive.
    d. demand is inelastic.
    e. average revenue is negative.

ANS: B DIF: Moderate REF: 51
TOP: Total Revenue, Marginal Revenue, and Price Elasticity MSC: Conceptual

40. Along a demand curve with unitary elasticity everywhere, total revenue:
    a. increases as output increases.
    b. decreases as output increases.
    c. remains constant as output increases.
    d. increases and then decreases as output increases.
    e. decreases and then increases as output increases.

ANS: C DIF: Easy REF: 52
TOP: Total Revenue, Marginal Revenue, and Price Elasticity MSC: Conceptual

41. Along a linear demand curve, total revenue is maximized:
    a. where the slope of a line from the origin to the demand curve is equal to the elasticity.
    b. where the elasticity is –1.
    c. near the quantity axis intercept.
    d. near the price axis intercept.
    e. where the elasticity is 0.

ANS: B DIF: Moderate REF: 52
TOP: Total Revenue, Marginal Revenue, and Price Elasticity MSC: Factual

42. The formula for the income elasticity of demand can be written as:
    a. $\eta_I = (\Delta Q / \Delta I)(I / Q)$.
    b. $\eta_I = (\Delta I / \Delta Q)(I / Q)$.
    c. $\eta_I = (\Delta Q / \Delta I)(Q / I)$.
    d. $\eta_I = (\Delta I / \Delta Q)(Q / I)$.
    e. none of the above.

    ANS: A DIF: Easy REF: 53
    TOP: The Income Elasticity of Demand MSC: Factual

43. The income elasticity of demand is defined as the:
    a. percentage change in the quantity demanded divided by the percentage change in the price level.
    b. change in the quantity demanded divided by the change in per capita income.
    c. percentage change in income divided by the percentage change in the quantity demanded.
    d. change in per capita income divided by the change in the quantity demanded.
    e. percentage change in the quantity demanded divided by the percentage change in per capita income.

    ANS: E DIF: Easy REF: 53
    TOP: The Income Elasticity of Demand MSC: Factual

44. In Russia, as per capita income rises from $1,980 to $2,020, everything else remaining constant, annual per capita consumption of vodka falls from 525 to 475 liters; this implies an income elasticity of demand for vodka of:
    a. –0.50.
    b. –5.0.
    c. 2.0.
    d. 5.0.
    e. 0.50.

    ANS: B DIF: Easy REF: 53
    TOP: The Income Elasticity of Demand MSC: Applied

45. The demand for answering machines is $Q = 1{,}000 – 150P + 25I$. Assume that per capita disposable income I is $200. When the price of answering machines is $P = $10, the income elasticity of demand is:
    a. 2.5.
    b. 0.11.
    c. 1.0.
    d. 25.
    e. 1.11.

    ANS: E DIF: Easy REF: 53
    TOP: The Income Elasticity of Demand MSC: Applied

46. In 1965, as per capita income among a particular segment of the population fell from $10,200 to $9,800, everything else remaining constant, annual per capita consumption of beer fell from 55 to 45 gallons; this implied an income elasticity of demand for beer of:
    a. 4.44.
    b. 4.55.

c. 5.0.
d. 4.65.
e. 0.5.

ANS: C DIF: Moderate REF: 53
TOP: The Income Elasticity of Demand MSC: Applied

47. The cross-price elasticity of demand is defined as the:
a. percentage change in the quantity demanded of a good divided by the percentage change in the good's price.
b. percentage change in the quantity demanded of a good divided by the percentage change in a different good's price.
c. percentage change in a good's price divided by the percentage change in a different good's price.
d. change in the quantity demanded of a good divided by the change in its price.
e. change in the quantity demanded of a good divided by the change in income.

ANS: B DIF: Easy REF: 56
TOP: Cross-Price Elasticities of Demand MSC: Factual

48. The formula for the cross-price elasticity of demand can be written as:
a. $\eta_{XY} = (\Delta Q_X / \Delta P_Y)(P_Y / Q_X)$.
b. $\eta_{XY} = (\Delta P_Y / \Delta Q_X)(P_Y / Q_X)$.
c. $\eta_{XY} = (\Delta P_Y / \Delta Q_X)(P_Y / Q_X)$.
d. $\eta_{XY} = (\Delta P_Y / \Delta Q_X)(Q_X / P_Y)$.
e. none of the above.

ANS: A DIF: Moderate REF: 56
TOP: Cross-Price Elasticities of Demand MSC: Factual

49. The demand for fax machines has been estimated to be $Q = 1{,}000 - P + 40L$, where P is the price of the machines and L is the average cost of a 10-minute midday call from Los Angeles to New York. At a fax machine price of $400 and a phone call cost of $10, the cross-price elasticity of demand for fax machines with respect to the price of phone service is:
a. 0.4.
b. 2.5.
c. –0.25.
d. 4.0.
e. 4.25.

ANS: A DIF: Moderate REF: 56
TOP: Cross-Price Elasticities of Demand MSC: Applied

50. Makers of disposable diapers must advertise 5% more to offset completely the 2% decline in sales due to heightened environmental concern. The advertising elasticity of demand is:
a. 4.0.
b. 0.4.
c. 2.5.
d. 0.25.
e. 0.20.

ANS: B DIF: Easy REF: 57
TOP: The Advertising Elasticity of Demand MSC: Applied

51. The constant price elasticity of demand for cigarettes has been estimated to be –0.5. To reduce smoking by 50%, approximately how much tax needs to be added to a $1 pack?
    a. $1.00
    b. $2.00
    c. $3.00
    d. $0.50
    e. $4.00

    ANS: A DIF: Moderate REF: 59
    TOP: Calculate the Price Elasticity of Demand MSC: Conceptual