QUESTIONS

1. Define *demand*. Define *supply*. In your answers, explain the difference between *demand* and *quantity demanded* and between *supply* and *quantity supplied*.
2. List the key nonprice factors that influence demand and supply.
3. In defining demand and supply, why do you think economists focus on price while holding constant other factors that might have an impact on the behavior of buyers and sellers?
4. Define comparative statics analysis. How does it compare with sensitivity analysis or what-if analysis used in finance, accounting, and statistics?
5. Define the *rationing function* of price. Why is it necessary for price to serve this function in the market economy?
6. Define the *guiding* or *allocating function* of price.
7. Discuss the differences between the short run and the long run from the perspective of producers and from the perspective of consumers.
8. Explain the difference between shortages and scarcity. In answering this question, you should consider the difference between the short run and the long run in economic analysis.
9. Why do you think it is important for managers to understand the mechanics of supply and demand both in the short run and in the long run? Give examples of companies whose business was either helped or hurt by changes in supply or demand in the markets in which they were competing.
10. "If Congress levies an additional tax on luxury items, the prices of these items will rise. However, this will cause demand to decrease, and as a result the prices will fall back down, perhaps even to their original levels." Do you agree with this statement? Explain.
11. Overheard at the water cooler in the corporate headquarters of a large manufacturing concern: "The competition is really threatening us with their new product line. I think we should consider offering discounts on our current line in order to stimulate demand." In this statement, is the term *demand* being used in a manner consistent with economic theory? Explain. Illustrate your answer using a line drawn to represent the demand for this firm's product line.
12. Briefly list and elaborate on the factors that will be affecting the demand for the following products in the next several years. Do you think these factors will cause the demand to increase or decrease?
    a. Convenience foods (sold in food shops and supermarkets)
    b. Products purchased on the Internet
    c. Fax machines
    d. Film and cameras
    e. Videos rented from retail outlets
    f. Pay-per-view television programing
    g. Airline travel within the United States; airline travel within Europe
    h. Gasoline
13. Briefly list and elaborate on the factors that will be affecting the supply of the following products in the next several years. Do you think these factors will cause the supply to increase or decrease?
    a. Crude oil
    b. Beef
    c. Computer memory chips
    d. Hotel rooms
    e. Fast food outlets in emerging markets
    f. Credit cards issued by financial institutions
    g. Laptop computers
    h. PC servers

PROBLEMS

1. The following function describes the demand condition for a company that makes caps featuring names of college and professional teams in a variety of sports.

$$Q = 2{,}000 - 100\,P$$

where Q is cap sales and P is price.

a. How many caps could be sold at $12 each?
b. What should the price be in order for the company to sell 1,000 caps?
c. At what price would cap sales equal zero?

2. Consider the following supply and demand curves for a certain product.

$$Q_S = 25{,}000\,P$$
$$Q_D = 50{,}000 - 10{,}000\,P$$

a. Plot the demand and supply curves.
b. What are the equilibrium price and equilibrium quantity for the industry? Determine the answer both algebraically and graphically. (Round to the nearest cent.)

3. The following relations describe the supply and demand for posters.

$$Q_D = 65{,}000 - 10{,}000\,P$$
$$Q_S = -35{,}000 + 15{,}000\,P$$

where Q is the quantity and P is the price of a poster, in dollars.

a. Complete the following table.

Price	Q_S	Q_D	Surplus or Shortage
$6.00			
5.00			
4.00			
3.00			
2.00			
1.00			

b. What is the equilibrium price?

4. The following relations describe monthly demand and supply for a computer support service catering to small businesses.

$$Q_D = 3{,}000 - 10\,P$$
$$Q_S = -1{,}000 + 10\,P$$

where Q is the number of businesses that need services and P is the monthly fee, in dollars.

a. At what average monthly fee would demand equal zero?
b. At what average monthly fee would supply equal zero?
c. Plot the supply and demand curves.
d. What is the equilibrium price/output level?
e. Suppose demand increases and leads to a new demand curve:

$$Q_D = 3{,}500 - 10\,P$$

What is the effect on supply? What are the new equilibrium P and Q?

f. Suppose new suppliers enter the market due to the increase in demand so the new supply curve is $Q = -500 + 10\,P$. What are the new equilibrium price and equilibrium quantity?
g. Show these changes on the graph.

5. The ABC marketing consulting firm found that a particular brand of portable stereo has the following demand curve for a certain region:

$$Q = 10{,}000 - 200\,P + 0.03\,\text{Pop} + 0.6\,I + 0.2\,A$$

where Q is the quantity per month, P is price ($), Pop is population, I is disposable income per household ($), and A is advertising expenditure ($).

a. Determine the demand curve for the company in a market in which $P = 300$, Pop $= 1{,}000{,}000$, $I = 30{,}000$, and $A = 15{,}000$.
b. Calculate the quantity demanded at prices of $200, $175, $150, and $125.

c. Calculate the price necessary to sell 45,000 units.

6. Joy's Frozen Yogurt shops have enjoyed rapid growth in northeastern states in recent years. From the analysis of Joy's various outlets, it was found that the demand curve follows this pattern:

$$Q = 200 - 300\,P + 120\,I + 65\,T - 250\,A_c + 400\,A_j$$

where Q = Number of cups served per week
P = Average price paid for each cup
I = Per capita income in the given market (thousands)
T = Average outdoor temperature
A_c = Competition's monthly advertising expenditures (thousands)
A_j = Joy's own monthly advertising expenditures (thousands)

One of the outlets has the following conditions: $P = 1.50$, $I = 10$, $T = 60$, $A_c = 15$, $A_j = 10$.

a. Estimate the number of cups served per week by this outlet. Also determine the outlet's demand curve.
b. What would be the effect of a $5,000 increase in the competitor's advertising expenditure? Illustrate the effect on the outlet's demand curve.
c. What would Joy's advertising expenditure have to be to counteract this effect?

7. Illustrate the example of the world sugar market with supply and demand diagrams. Be sure to show how the relative shifts in supply and demand have led to the reduction in the world price of sugar.

8. Over the past decade, the demand for CDs has dramatically increased. What are some of the causes of this increase in demand? According to supply-and-demand theory, price should rise when demand increases. However, in recent years the average price of a CD has actually fallen. Explain this apparent contradiction between the theory and fact.

9. Suppose a firm has the following demand equation:

$$Q = 1{,}000 - 3{,}000\,P + 10\,A$$

where Q = quantity demanded
P = product price (in dollars)
A = advertising expenditure (in dollars)

Assume for the following questions that $P = \$3$ and $A = \$2{,}000$.

a. Suppose the firm dropped the price to $2.50. Would this be beneficial? Explain. Illustrate your answer with the use of a demand schedule and demand curve.
b. Suppose the firm raised the price to $4.00 while increasing its advertising expenditure by $100. Would this be beneficial? Explain. Illustrate your answer with the use of a demand schedule and a demand curve. (Hint: First construct the schedule and the curve assuming $A = \$2{,}000$. Then construct the new schedule and curve assuming $A = \$2{,}100$.)

10. A travel company has hired a management consulting company to analyze demand in 26 regional markets for one of its major products: a guided tour to a particular country. The consultant uses data to estimate the following equation (the estimation technique is discussed in detail in chapter 5):

$$Q = 1{,}500 - 4P + 5A + 10I + 3PX$$

where Q = amount of the product demanded
P = price of the product in dollars
A = advertising expenditures in *thousands* of dollars
I = income in *thousands* of dollars
PX = price of some other travel products offered by a competing travel company

a. Calculate the amount demanded for this product using the following data:

$P = \$400$
$A = \$20{,}000$

$$I = \$15{,}000$$
$$PX = \$500$$

b. Suppose the competitor reduced the price of its travel product to $400 to match the price of this firm's product. How much would this firm have to increase its advertising in order to counteract the drop in its competitor's price? Would it be worth it for them to do so? Explain.

c. What other variables might be important in helping estimate the demand for this travel product?

11. Following are three sample equations. Plot them on a graph in which Q is on the vertical axis and P is on the horizontal axis. Then transform these equations so P is expressed in terms of Q and plot these transformed equations on a graph in which P is on the vertical axis and Q is on the horizontal axis.
    a. $Q = 250 - 10P$
    b. $Q = 1{,}300 - 140P$
    c. $Q = 45 - 0.5P$
12. Use the following equation to derive a demand schedule and a demand curve. What types of products might exhibit this type of nonlinear demand curve? Explain.

$$Q = 100P^{-0.3}$$

QUESTIONS

1. State the general meaning of *elasticity* as it applies to economics. Define the *price elasticity of demand.*
2. Explain the difference between *point elasticity* and *arc elasticity.* What problem can arise in the calculation of the latter, and how is it usually dealt with? In actual business situations, would you expect arc elasticity to be the more useful concept? Why or why not?
3. It has often been said that craft unions (electricians, carpenters, etc.) possess considerably greater power to raise wages than do industrial unions (automobile workers, steel workers, etc.). How would you explain this phenomenon in terms of demand elasticity?
4. Discuss the relative price elasticity of the following products:
   a. Mayonnaise
   b. A specific brand of mayonnaise
   c. Chevrolet automobiles
   d. Jaguar automobiles
   e. Washing machines
   f. Air travel (vacation)
   g. Beer
   h. Diamond rings
5. What would you expect to happen to spending on food at home and spending on food in restaurants during a decline in economic activity? How would income elasticity of demand help explain these changes?
6. Would you expect the cross-elasticity coefficients between each of the following pairs of products to be positive or negative? Why?
   a. Personal computers and software
   b. Electricity and natural gas
   c. Apples and oranges
   d. Bread and VCRs
7. Why is it unlikely that a firm would sell at a price and quantity where its demand curve is price inelastic?
8. Which products would exhibit a higher elasticity with respect to interest rates, automobiles or small appliances? Why?
9. The immediate effect of gasoline price increases in the aftermath of the Persian Gulf crisis in August 1990 on gasoline consumption was not very significant. Would you expect the consumption of gasoline to be more severely affected if these higher prices remained in effect for a year or more? Why or why not?
10. In December 1990, the federal tax on gasoline increased by 5 paise per gallon. Do you think that such an increase, reflected in the price of gasoline, would have a significant impact on gasoline consumption?
11. Why do you think that whenever governments (federal and state) want to increase revenues, they usually propose an increase in taxes on cigarettes and alcohol?
12. Could a straight-line demand curve ever have the same elasticity on all its points?
13. If a demand curve facing a firm is horizontal or nearly so, what does it say about this firm's competition?
14. A company faced by an elastic demand curve will always benefit by decreasing price. True or false? Explain.
15. Discuss the income elasticities of the following consumer products:
   a. Margarine
   b. Fine jewelry
   c. Living room furniture
   d. Whole lobsters
16. If the income elasticity of tomatoes is estimated to approximate +0.25, what would you expect to happen to the consumption of tomatoes as personal income rises?
17. (Read the "The Market for Used Automobiles" section in Appendix 4A before answering the question.) When prices of used cars dropped about 10 percent in October 2001, their sales increased by 4.5 percent. Does this mean that the demand elasticity for used cars is 0.45?

18. In 2002 the U.S. Postal Service increased first-class postage rates from 34¢ to 37¢. The service had been losing money. One of the reasons is increased competition from companies such as United Parcel Service and Federal Express. Another reason is the use of faxes and e-mail, as well as electronic bill payment. With this decrease in demand for postal services, why do you think that the Postal Service is seeking a rate increase?
19. A Canadian apparel company, Roots, agreed to provide the U.S. Olympic team at the 2002 Winter Olympics with various types of clothing, including berets, for free, and further, to turn over a portion of its profits on sales of this clothing to the U.S. Olympic Committee. The beret became an instant success, and Roots sold a large number of them. What type of elasticity does this arrangement represent?

PROBLEMS

1. The Aryan Paper Company lowers its price of envelopes (1,000 count) from Rs. 6 to Rs. 5.40. If its sales increases by 20 percent following the price decrease, what is the elasticity coefficient?
2. The demand function for a cola-type soft drink in general is $Q = 20 - 2P$, where Q stands for quantity and P stands for price.
   a. Calculate point elasticities at prices of 5 and 9. Is the demand curve elastic or inelastic at these points?
   b. Calculate arc elasticity at the interval between $P = 5$ and $P = 6$.
   c. At which price would a change in price and quantity result in approximately no change in total revenue? Why?
3. The equation for a demand curve has been estimated to be $Q = 100 - 10P + 0.5Y$, where Q is quantity, P is price, and Y is income. Assume $P = 7$ and $Y = 50$.
   a. Interpret the equation.
   b. At a price of 7, what is price elasticity?
   c. At an income level of 50, what is income elasticity?
   d. Now assume income is 70. What is the price elasticity at $P = 8$?
4. Mr. Ali has the following demand equation for a certain product: $Q = 30 - 2P$.
   a. At a price of Rs. 7, what is the point elasticity?
   b. Between prices of Rs. 5 and Rs. 6, what is the arc elasticity?
   c. If the market is made up of 100 individuals with demand curves identical to Mr. Ali's, what will be the point and arc elasticity for the conditions specified in parts *a* and *b*?
5. The Teenager Company makes and sells skateboards at an average price of Rs. 70 each. During the past year, they sold 4,000 of these skateboards. The company believes that the price elasticity for this product is about −2.5. If it decreases the price to Rs. 63, what should be the quantity sold? Will the revenue increase? Why?
6. The ABC Company manufactures AM/FM clock radios and sells on average 3,000 units monthly at Rs. 25 each to retail stores. Its closest competitor produces a similar type of radio that sells for Rs. 28.
   a. If the demand for ABC's product has an elasticity coefficient of −3, how many will it sell per month if the price is lowered to Rs. 22?
   b. The competitor decreases the price to Rs. 24. If cross-elasticity between the two radios is 0.3, what will ABC's monthly sales be?
7. The Mohan Bagan football team plays in a stadium with a seating capacity of 1,80,000. However, during the past season, attendance averaged only 1,50,000. The average ticket price was Rs. 30. If price elasticity is −4, what price would the team have to charge in order to fill the stadium? If the price were to be decreased to Rs. 27 and the average attendance increased to 1,60,000, what is the price elasticity?
8. The Mesa Redbirds football team plays in a stadium with a seating capacity of 80,000. However, during the past season, attendance averaged only 50,000. The average ticket price was Rs. 30. If price elasticity is −4, what price would the team have to charge in order to fill the stadium? If the price were to be decreased to Rs. 27 and the average attendance increased to 60,000, what is the price elasticity?
9. The Efficient Software Store had been selling a spreadsheet program at a rate of 100 per month and a graphics program at the rate of 50 per month. In September 2007, Efficient's supplier lowered the price

for the spreadsheet program, and Efficient passed on the savings to customers by lowering its retail price from Rs. 400 to Rs. 350. The store manager then noticed that not only had sales of the spreadsheet program risen to 120, but also the sales of the graphics program increased to 56 per month. Explain what has happened. Use both arc price elasticity and arc cross-elasticity measures in your answer.

10. Given the demand equation $Q = 1{,}500 - 200P$, calculate all the numbers necessary to fill in the following table:

		Elasticity			
P	Q	Point	Arc	Total Revenue	Marginal Revenue
$7.00					
6.50					
6.00					
5.50					
5.00					
4.50					
4.00					
3.50					
3.00					
2.50					

$$\frac{\varepsilon_Q}{dY} = \frac{dY}{dP} \times \frac{P_1}{Q_1}$$

11. Would you expect cross-elasticity between the following pairs of products to be positive, negative, or zero?
    a. Television sets and VCRs
    b. Rye bread and whole wheat bread
    c. Construction of residential housing and furniture
    d. Breakfast cereal and men's shirts

    Explain the relationship between each pair of products.
12. In order to attract more customers on Mondays (a slow day), Alex's Pizza Shop in Austin decided to reduce the price of their pizza rolls from Rs. 3.50 to Rs. 2.50. As a result, Monday sales increased from 70 to 130. Also, Alex's sales of ready-to-eat snacks rose from 40 to 90.
    a. Calculate the arc price elasticity of demand for the pizza rolls.
    b. Calculate the arc cross-price elasticity of demand between ready-to-eat snacks sales and pizza rolls prices.
13. According to a study, the price elasticity of shoes in the United States is 0.7, and the income elasticity is 0.9.
    a. Would you suggest that the Brown Shoe Company cut its prices to increase its revenue?
    b. What would be expected to happen to the total quantity of shoes sold in the United States if incomes rise by 10 percent?
14. A book store opens across the street from the University Book Store (UBS). The new store carries the same textbooks but offers a price 20 percent lower than UBS. If the cross-elasticity is estimated to be 1.5, and UBS does not respond to its competition, how much of its sales is it going to lose?
15. A local supermarket lowers the price of its vanilla ice cream from Rs. 3.50 per half gallon to Rs. 3. Vanilla ice cream (unit) sales increase by 20 percent. The store manager notices that the (unit) sales of chocolate syrup increase by 10 percent.
    a. What is the price elasticity coefficient of vanilla ice cream?
    b. Why have the sales of chocolate syrup increased, and how would you measure the effect?
    c. Overall, do you think that the new pricing policy was beneficial for the supermarket?
16. The Compute Company store has been selling its special word processing software, Aceword, during the last 10 months. Monthly sales and the price for Aceword are shown in the following table. Also shown are the prices for a competitive software, Goodwrite, and estimates of monthly family income. Calculate the appropriate elasticities, keeping in mind that you can calculate an elasticity measure only when all other factors do not change.

Month	Price Aceword	Quantity Aceword	Family Income	Price Goodwrite
1	$120	200	$4,000	$130
2	120	210	4,000	145
3	120	220	4,200	145
4	110	240	4,200	145
5	114	230	4,200	145
6	115	215	4,200	125
7	115	220	4,400	125
8	105	230	4,400	125
9	105	235	4,600	125
10	105	220	4,600	115

17. The demand curve for product X is given as $Q = 2000 - 20P$.
    a. How many units will be sold at Rs. 10?
    b. At what price would 2,000 units be sold? 0 units? 1,500?
    c. Write equations for total revenue and marginal revenue (in terms of Q).
    d. What will be the total revenue at a price of Rs. 70? What will be the marginal revenue?
    e. What is the point elasticity at a price of Rs. 70?
    f. If price were to decrease to Rs. 60, what would total revenue, marginal revenue, and point elasticity be now?
    g. At what price would elasticity be unitary?
18. The Transportation Authority in Anytown, USA, raised bus fares from Rs. 1 to Rs. 1.15 on January 1, 2006. The authority's statistics show that the number of passengers riding buses decreased from 672,000 in 2006 to 623,000 in 2007.
    a. How much did revenue change?
    b. What is the arc elasticity for bus travel in Anytown?
    c. The answer to b would be correct if all conditions (except price) remained the same between 2006 and 2007. Can you think of any other changes that would have affected the result?
19. (Read the "Newspapers and Their Price Elasticity" section in Appendix 4A before answering the question.) What is the arc demand elasticity for the London *Times*? What happened to revenue as a result of the price decrease?
20. The Distinctive Fashions Company increased its advertising budget for its leading brand of ladies' dresses from Rs. 10,000 in 2006 to Rs. 15,000 in 2007. Its sales increased from 900 units to 1,050 units, while the price remained the same at Rs. 120 per dress. Calculate the advertising elasticity of these dresses. Was this a wise move by the company?
21. Manning Inc. is the leading manufacturer of garage doors. Demand for residential garage door sales depends, of course, on the rate of new house building activity, which in turn depends on changes in income per capita. During the past year, Manning sold 10,000 garage doors at an average price of Rs. 1,500 per door. In the coming year, disposable income per capita is expected to increase from Rs. 32,000 to Rs. 34,000. Without any price change, Manning expects current-year sales to rise to 12,000 units.
    a. Calculate the arc income elasticity of demand.
    b. The company economist estimates that if the price of doors is increased by Rs. 100, they could sell 11,500 doors. What is the arc price elasticity and what would be the company's revenue?
    c. Should they raise the price even more?