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# Microeconomics



ProActive プロアクティブ／グアム大学日本事務局

## Microeconomics

### ミクロ経済学

BECで出題される経済学（ミクロとマクロ）の4択問題は合計6～8問です。

EssayなどのSimulationはありません。

最初にミクロ経済を学びますが、用語の意味または定義を暗記すれば簡単に解けます。

ミクロ経済は企業や個人にスポットをあてています。

マクロ経済は国の動向です。

いくつかの用語は日々 Newsなどで耳にしていますのでまったく問題がないでしょう。例えば需要（Demand）、供給（Supply）。

基本的な問題しか出題されません。経済学者になるための試験ではないですからね。

ミクロ経済は29問の問題をときますが これで十分です。

# DEMAND

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## A. Overview

1. Economics: Study of the allocation of scarce resources among alternatives
2. Economic Theory: Assumes that there are limited resources available to fulfill the unlimited desires of people
  - a. Microeconomics: Deals with the economic decisions of individuals (buyers) and firms (sellers) in pursuit of maximizing satisfaction
  - b. Macroeconomics: Deals with aggregates; allocating resources to maximize social welfare (total production, total employment, and general price level)

## B. Law of Demand: The quantity purchased of a good or service is inversely related to the price, all other things being equal

1. Price goes up, demand goes down
2. Price goes down, demand goes up

## C. Factors Affecting Demand

1. Cross Elasticity of Demand: The more closely the two goods are related, the greater the influence on the change in demand of the other product
  - a. Substitute Goods: closely related goods
    - (1) Just like they sound, one good is a substitute for the other
    - (2) Examples
      - (a) Margarine and butter
      - (b) Mayonnaise and Miracle Whip™
      - (c) Movies at the theater and movie rentals
      - (d) Chicken and turkey
    - (3) When the price of one good goes up, demand for that good tends to decrease as some consumers purchase the substitute

- b. Complements: Closely related goods
  - (1) Examples
    - (a) Peanut butter and jelly
    - (b) Cameras and rolls of film
    - (c) Razors and razor blades
  - (2) Behavior: When the price of one good goes up, demand for that product and its complement tends to decrease.
- 2. Income
  - a. As personal income increases, the demand for normal goods (e.g., steaks or airline tickets) goods increases and vice versa
  - b. As personal income increases, the demand for inferior goods (e.g., potatoes) goods decreases (and vice versa)
- 3. Future Price Expectations
  - a. If consumers expect future prices to be higher, current demand increases as people look to enjoy goods/services before prices increase
  - b. If consumers expect future prices to be lower, current demand decreases as people defer purchases until prices go down
- 4. Preferences it changes time to time
- 5. Market Size affect demand(e.g. population)
- 6. Group Actions boycott

Notes: \_\_\_\_\_  
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Population increase or decrease

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Exhibit 1: Demand Curve for

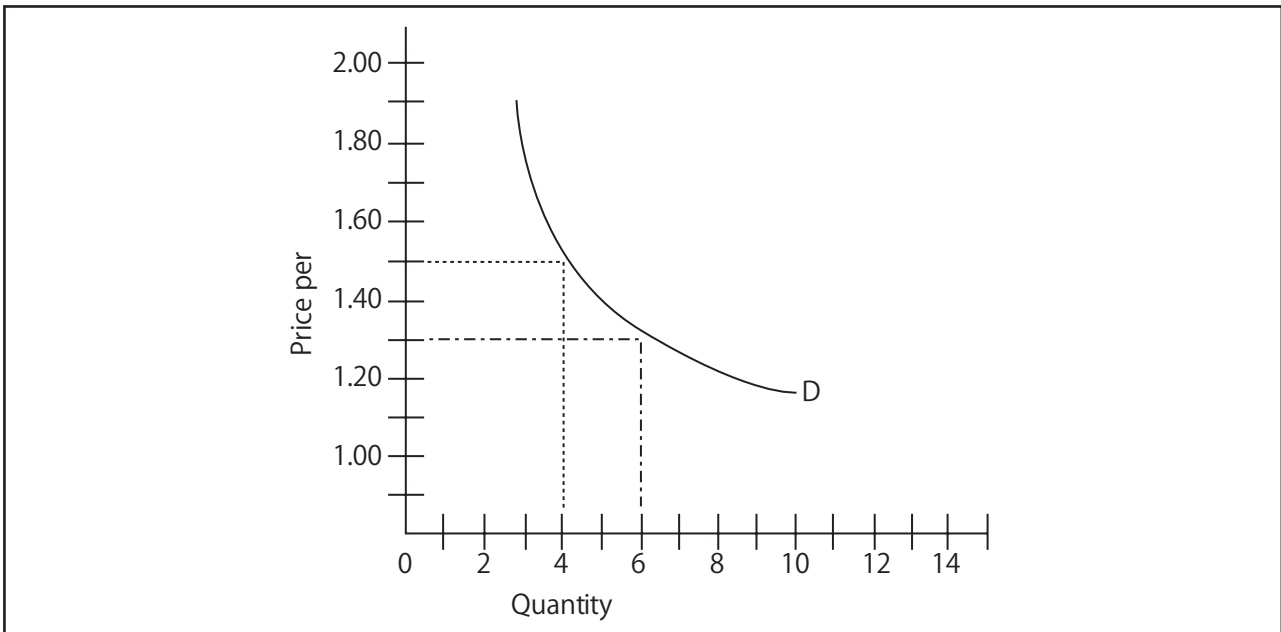
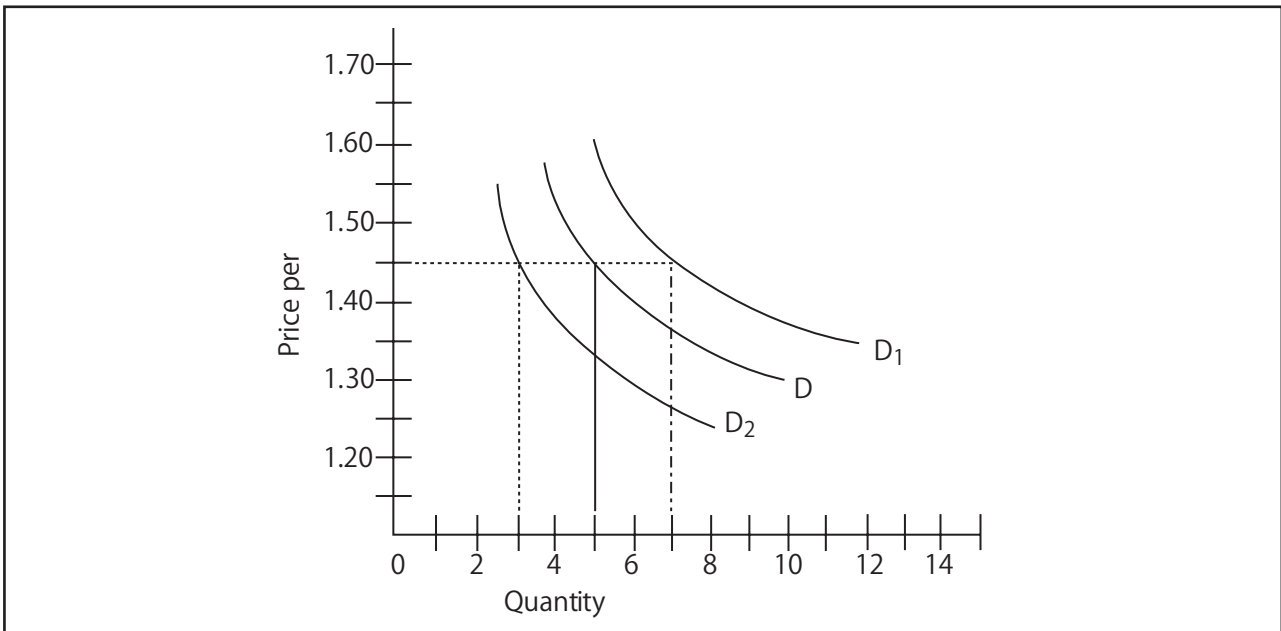


Exhibit 2: Demand Curves for



D→D1 shift to the right

D→D2 shift to the left

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# SUPPLY

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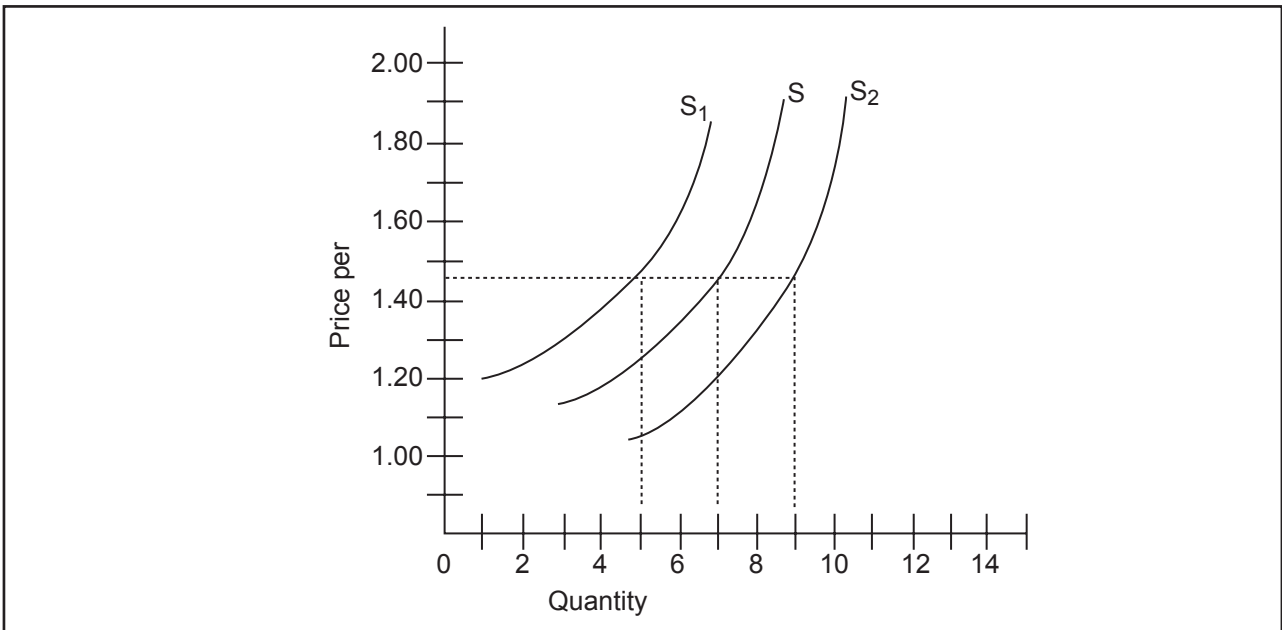
- A. Quantity Supplied: The quantity of a good or service that sellers are prepared to sell at a given price at a given point in time
- B. Law of Supply: The quantity of a good or service sold is directly related to the price, all other things being equal
1. Price goes up, supply goes up
  2. Price goes down, supply goes down
- C. Factors Affecting Supply
1. Production Costs (wages, supplies, taxes, etc.)
    - a. Increases in production costs result in decreases in supply
    - b. Decreases in production costs result in increases in supply
  2. Technology: Technological improvements in production tend to increase the supply
  3. Prices of Other Goods
    - a. X and Y are made with similar materials, but the price of Y has gone up, causing producers to produce more of product Y and less of good X
    - b. If the price of materials has not changed, the supplier will make a higher profit margin on Y
  4. Price Expectations: An anticipated increase in the price of a good will cause a firm to supply less now and more later when that anticipated price increase arrives

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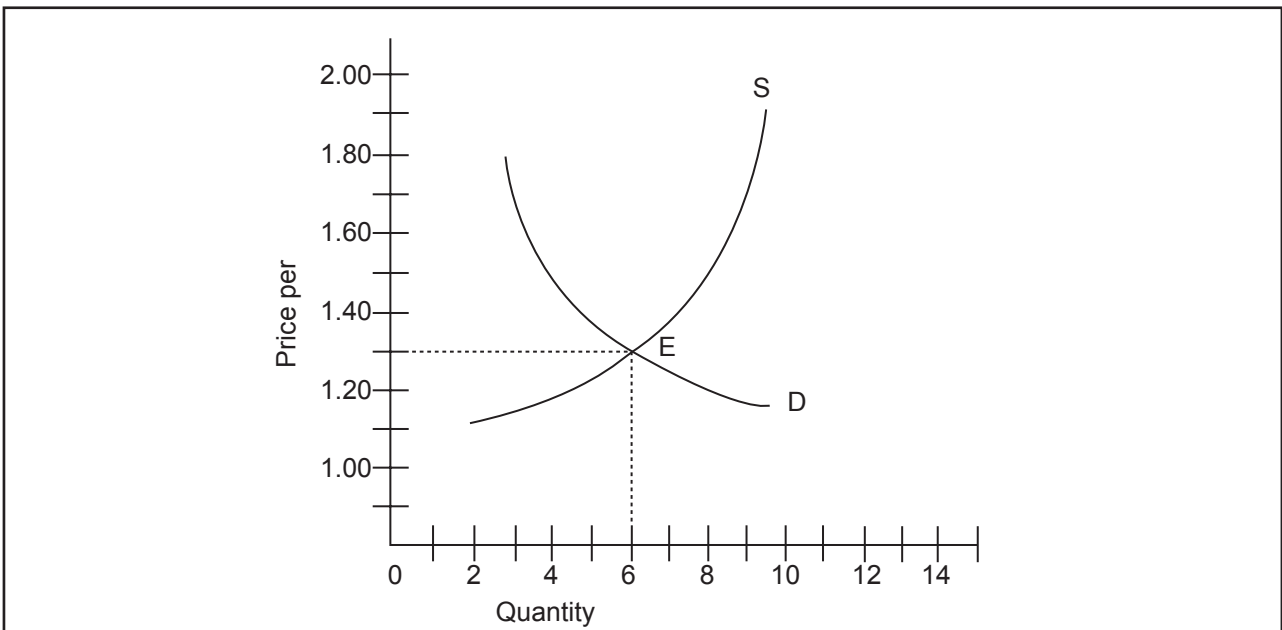
Law of supply, directly related

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**Exhibit 3: Supply Curves for**



**Exhibit 4: Demand, Supply, and Market Price for**



E=Equilibrium (market price)

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# ELASTICITY

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- A. Overview: Measure of the sensitivity or responsiveness of quantity demanded/ supplied to a change in a determinant of demand/supply
- B. Price Elasticity of Demand
  - I. Measure of the sensitivity or responsiveness of quantity demanded to a change in a price (which is a determinant of demand)
  - 2. Formula Approach: Determine the price elasticity of demand using either the formula approach or the total revenue approach
    - a. Simple Method:  $E(d) = [(D_2 - D_1) / (D_1)] / [(P_2 - P_1) / (P_1)]$
    - b. Arc Method:  $E(d) = [(D_2 - D_1) / ((D_1 + D_2) / 2)] / [(P_2 - P_1) / ((P_1 + P_2) / 2)]$ 
      - (1)  $D_1$  = Demand prior to change in price
      - (2)  $D_2$  = Demand after the price change
      - (3)  $P_1$  = Price prior to changing
      - (4)  $P_2$  = Price after the change
  - 3. Absolute Values (ignore any negative values)

## Example 1. Price Elasticity of Demand Example Using Simple Method

When a supplier prices his hot dogs at \$1.00 per hot dog the quantity demanded is 100 hot dogs during a normal lunch hour. When the supplier changes the price to \$0.75 per hot dog the quantity demanded is 150 hot dogs.

Simple Formula:  $(150 - 100) / (100) / (\$0.75 - \$1.00) / (\$1.00)$   
 $50 / 100 / \$0.25 / \$1.00 = 0.50 / 0.25 = 2$

Thus, demand is elastic (demand is elastic, if coefficient is  $> 1$ )



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### Example 2: Price Elasticity of Demand Example Using Arc Method

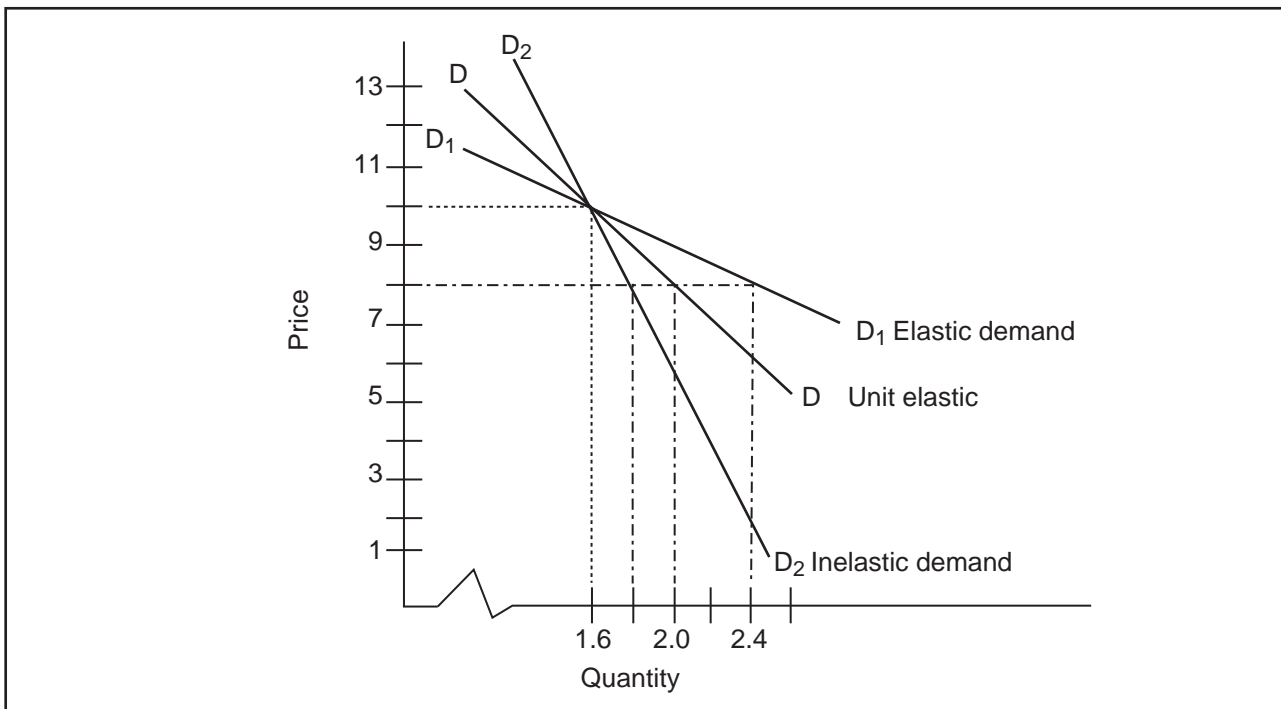
When a supplier prices his hot dogs at \$1.00 per hot dog, the quantity demanded is 100 hot dogs during a normal lunch hour. When the supplier changes the price to \$0.75 per hot dog, the quantity demanded is 150 hot dogs.

Arc Formula:  $[(D_2 - D_1) / ((D_1 + D_2) / 2)] / [(P_2 - P_1) / ((P_1 + P_2) / 2)]$

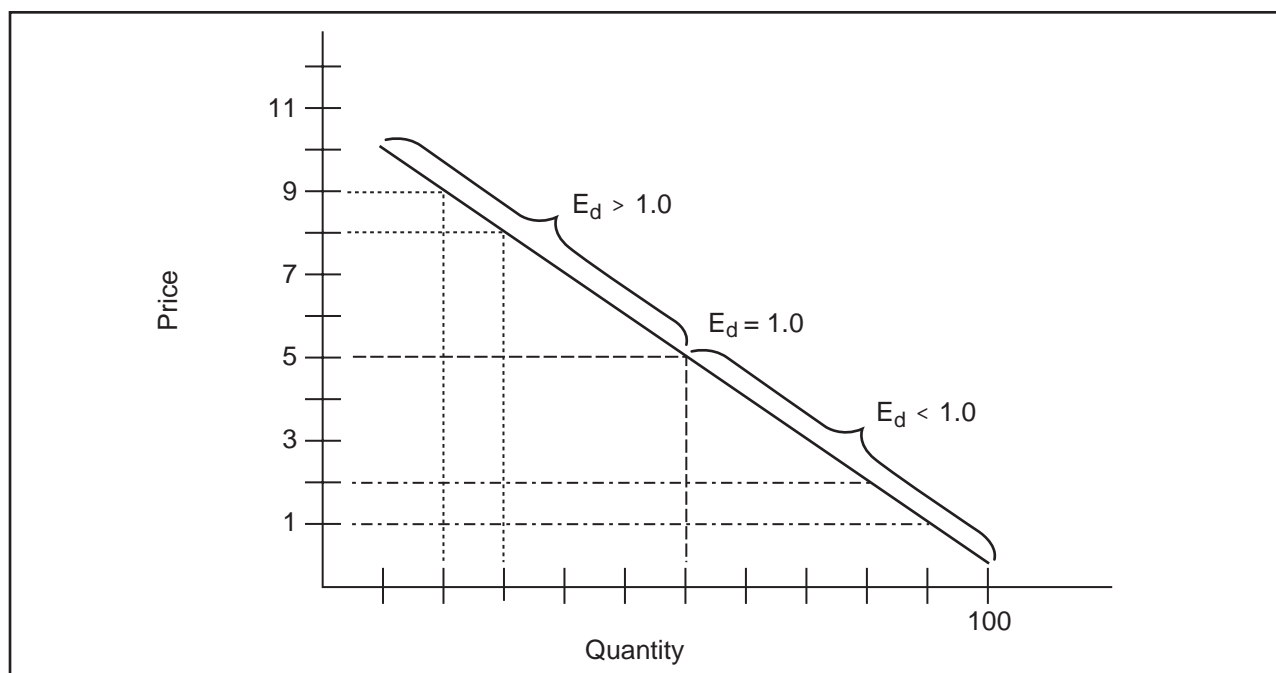
$[(150 - 100) / ((100 + 150) / 2)] / [(\$0.75 - \$1.00) / ((\$1.00 + 0.75) / 2)]$   
 $(50 / 125) / (\$0.25 / \$0.875) = 0.40 / 0.2857 = 1.4$

Thus, demand is elastic (demand is elastic, if coefficient is > 1)

### Exhibit 5: Demand Curve Showing Different Elasticities



**Exhibit 6: Demand Curve Showing Different Elasticities**



4. Goods That Tend to Be Elastic

- a. Luxuries
- b. Large expenditures
- c. Durable goods
- d. Substitute goods

5. Goods That Tend to Be Inelastic

- a. Necessities
- b. Small expenditures
- c. Perishable goods
- d. Complementary goods

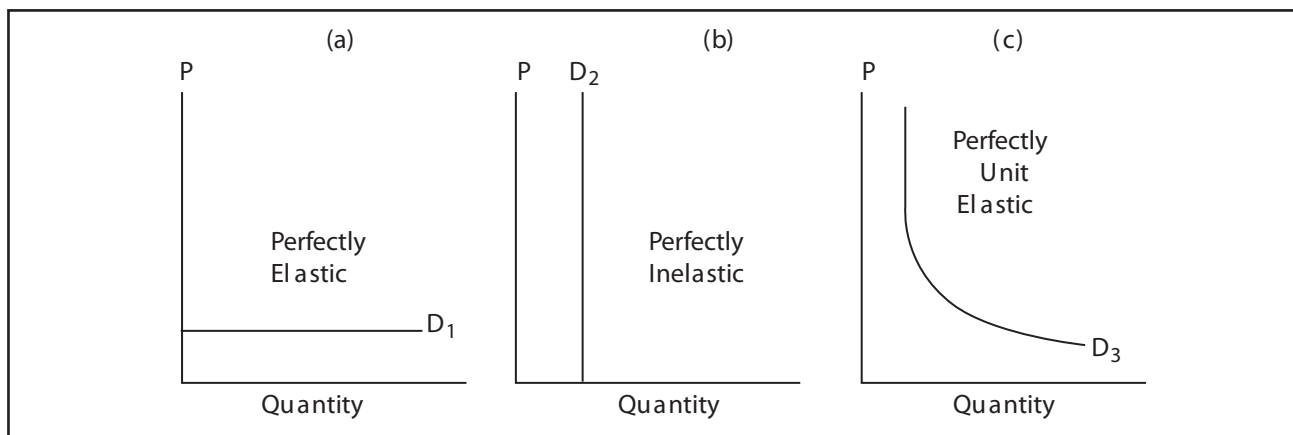
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Exhibit 7: Three Demand Curves Showing Different Elasticities



6. Total Revenue Approach: Determine the price elasticity of demand using either the formula approach or the total revenue approach

a. If prices increase and

- (1) Total revenue goes down: Demand is elastic
- (2) Total revenue remains the same: Demand is unitary elastic
- (3) Total revenue goes up: Demand is inelastic

b. If prices decrease and

- (1) Total revenue goes down: Demand is inelastic
- (2) Total revenue remains the same: Demand is unitary elastic
- (3) Total revenue goes up: Demand is elastic

C. Price Elasticity of Supply

1. Measure of the sensitivity or responsiveness of quantity supplied to a change in price of the good (determinant of supply)

2. % change in quantity supplied / % change in price

a. Simple Method:  $E(s) = [(S_2 - S_1) / S_1] / [(P_2 - P_1) / P_1]$

b. Arc Method:  $E(s) = [(S_2 - S_1) / ((S_2 + S_1) / 2)] / [(P_2 - P_1) / ((P_2 + P_1) / 2)]$

D. Cross Elasticity of Demand

1. Measure of the sensitivity or responsiveness of quantity demanded to a change in price of a different good
2.  $\% \text{ change in quantity demanded for good X} / \% \text{ change in price of good Y}$  (not absolute values)
  - a. If  $> 0$ , substitutes
  - b. If  $< 0$ , complements
  - c. If  $= 0$ , unrelated

E. Income Elasticity of Demand

1. Measure of the sensitivity or responsiveness of quantity demanded to a change in income
2.  $\% \text{ change in quantity demanded} / \% \text{ change in income}$

**Example 3**

A 10% increase in income results in a 8% increase in steak; more income and more steak, the  $E(d)$  is  $> 0$ ; steak is a normal good

**Example 4**

A 12% increase in income results in a 5% decrease in potatoes...so consumers are making more and buying less,  $E(d) < 0$ ; potatoes are inferior goods.

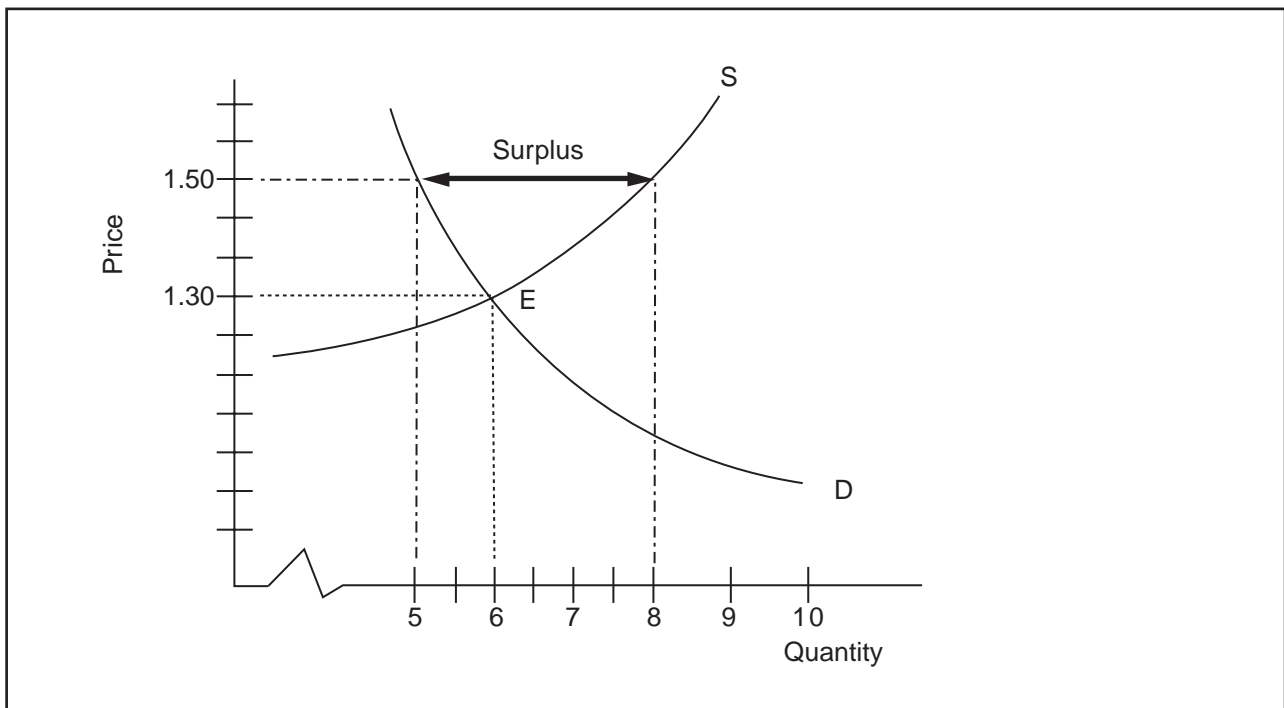
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# MARKET

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- A. Description: Interaction between buyers and sellers of a good
- B. Equilibrium (or Market) Price: Point at which the demand and supply curves meet
- C. Price Floor
  - 1. Government-mandated minimum price that can be charged for a good or service
  - 2. If the floor is above the market or equilibrium price, surpluses will develop

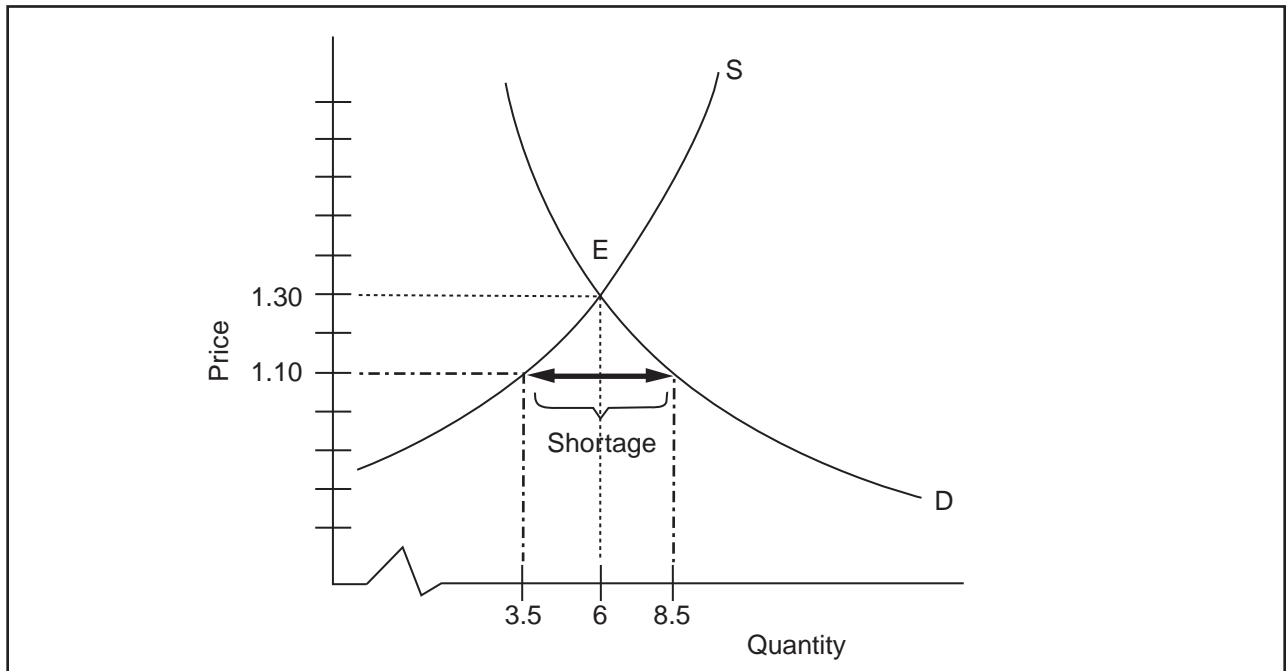
**Exhibit 8: Surplus of**



D. Price Ceiling

1. Government-mandated maximum price that can be charged for a good or service
2. If the ceiling is below the market equilibrium, a shortage will develop

**Exhibit 9: Shortage of**



**Table 1: Interaction of Shifts in Supply and Demand and Prices**

<u>Demand</u>	<u>Supply</u>	<u>Price</u>
Increase	Constant	Increase
Decrease	Constant	Decrease
Constant	Increase	Decrease
Constant	Decrease	Increase
Increase	Increase	Unknown
Decrease	Decrease	Unknown
Increase	Decrease	Increase
Decrease	Decrease	Decrease

*Independently answer questions 1-13.*

QUESTIONS

1. If a law establishes a maximum price for product Y in a competitive market and the ceiling price is above the market or equilibrium price for product Y,
  - a. The law has no effect on the market of good Y.
  - b. A surplus of good Y will occur.
  - c. Supply of Y will decrease as price increases.
  - d. A shortage for Y will occur. (9911)
  
2. If the demand for cigars in Miami is relatively elastic, and Miami imposes high taxes on cigars that result in higher cigar prices, then in Miami
  - a. The quantity of cigars demanded would increase.
  - b. The demand for cigars would increase.
  - c. The demand curve for cigars would become vertical.
  - d. Expenditures on cigars would fall. (9911)
  
3. If the coefficient of elasticity is two, then the consumer demand for the product is said to be
 

=1

  - a. Unit elastic.
  - b. Elastic. =less than 1
  - c. Inelastic.
  - d. Perfectly inelastic. (7211)
  
4. If the average household income decreases and there is no change in the price of a normal good, then the
  - a. Supply curve will shift to the right.
  - b. Quantity demanded will move farther up the demand curve.
  - c. Demand will shift to the right.
  - d. Demand curve will shift to the left. (9911)
  
5. An increase in the price of a complementary good will
  - a. Shift the demand curve of the joint commodity to the right.
  - b. Decrease the price paid for a substitute good.
  - c. Shift the supply curve of the joint commodity to the right.
  - d. Shift the demand curve of the joint commodity to the left. (9911)
  
6. If shoes are part of the consumers' basket of goods, and the Consumer Price Index increased by 6% for the year while the price of shoes increased by 2%, then
  - a. The supply curve will shift to the left.
  - b. Neither the demand curve nor the supply curve will be affected.
  - c. The demand curve will shift to the right.
  - d. The demand curve will shift to the left. (9911)
  
7. Y and Z are substitute goods. What would cause a shift in the supply curve to the right for Y, a normal good?
  - a. An increase in the price paid for Z.
  - b. Cost-saving technological improvements in the production process for Z.
  - c. An expected increase in the future price of Y.
  - d. Cost-saving technological improvements in the production process for Y. (714 9)

8. The market for product A is elastic and purely competitive. If the market price of product A increases, what is the effect on total revenue?

- a. Decreases
- b. Increases
- c. Cannot be determined from the information given.
- d. Remains the same. (9911)

9. Below is the demand schedule for Kendall tomatoes.

Price	Quantity Demanded by		
	Michael	Kevin	Gabriel
\$4.00	1	2	0
\$3.50	2	4	0
\$3.00	3	6	2
\$2.50	4	8	5

Michael, Kevin, and Gabriel are the only buyers of Kendall tomatoes. Which of the following sets of prices and levels of output would be on the market demand curve?

- a. \$4.00, 3; \$3.00, 12
- b. \$4.00, 10; \$2.50, 17
- c. \$3.00, 11; \$4.00, 3
- d. \$2.50, 17; \$4.00, 10 (9911)

10. An improvement in technology that in turn leads to improved worker productivity would most likely result in

- a. Wage decreases.
- b. Wage increases.
- c. A shift to the right in the supply curve and a lowering of the price of the output.
- d. A shift to the left in the supply curve and a lowering of the price of the output. (9911)

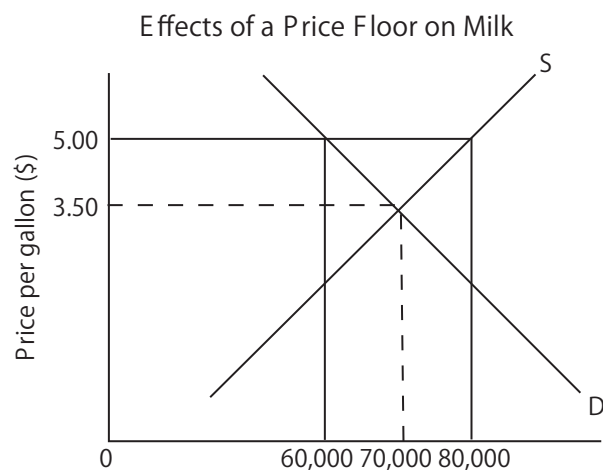
11. An increase in the market supply of coffee would result in a(n)

- a. Increase in the price of coffee.
- b. Decrease in the demand for coffee.
- c. Increase in the price of tea.
- d. Increase in the quantity of coffee demanded. (9911)

12. In any competitive market, an equal decrease in both demand and supply can be expected to always

- a. Decrease both price and market-clearing quantity.
- b. Increase both price and market-clearing quantity.
- c. Decrease market-clearing quantity
- d. Decrease price. (9911)

13. If a legal price floor of \$5.00 is declared given the situation illustrated in the accompanying diagram, what will be the result?



- a. A surplus of 20,000 gallons.
- b. A shortage of 20,000 gallons. **80,000-60,000**
- c. A shortage of 10,000 gallons.
- d. A surplus of 10,000 gallons. (9911)



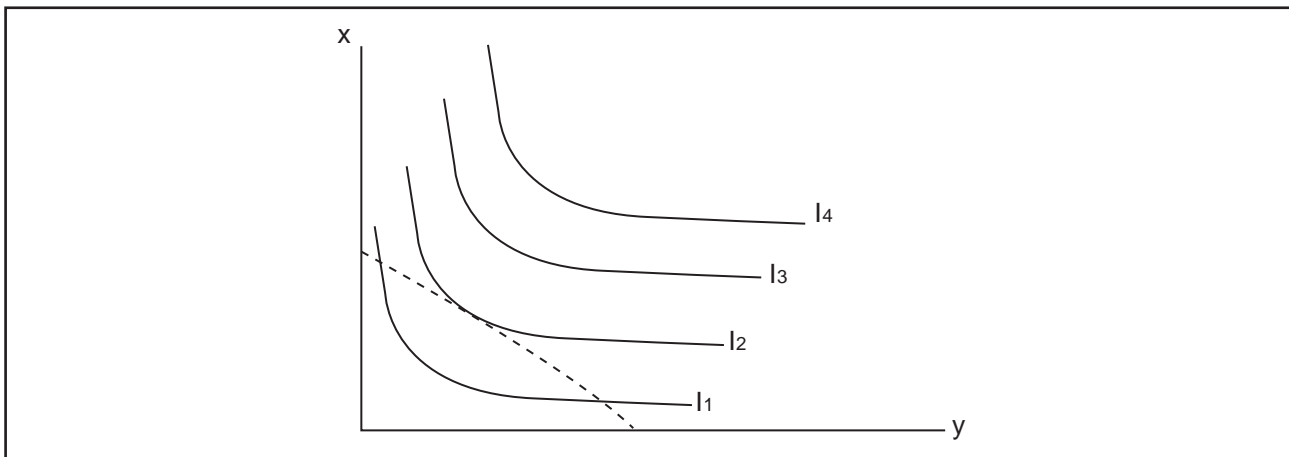
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# UTILITY

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- A. Definition: Satisfaction derived from a good/service
- B. Marginal Utility: Additional utility obtained from one more unit
- C. Diminishing Marginal Utility: Each additional unit provides less satisfaction
  - 1. The first lobster tail is the best
  - 2. The second is good
  - 3. The fifth may make me sick
- D. Individual's Objective (according to utility theory): Maximize utility given her/his available income
  - 1. Objective is achieved when the utility obtained from the last dollar spent on each commodity purchased is the same
  - 2. Utility is maximized where the budget constraint line is tangent to the highest possible indifference curve

**Exhibit 10: Indifference Curves & Budget Constraint Line**



- a. Indifference Curve: Various combinations of goods x and y that give equal utility
    - (1) Nonlinear
    - (2) Parallel to each other
    - (3) Negatively sloped
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- 
- (4) Convex to origin
  - (5) Each curve represents different levels of utility

b. Budget Constraint Line: All the possible combinations of two commodities that an individual can purchase given a set level of income and at given prices

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Utility---Satisfaction

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# TERMINOLOGY

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- A. Factors of Production & Their Returns
    - 1. Land: Rent
    - 2. Labor: Wages
    - 3. Capital: Interest
    - 4. Management/Entrepreneurial Activity: Profits
  
  - B. Cost Classifications
    - 1. Fixed Costs
      - a. Total Fixed Costs (TFC): Costs that remain constant as output varies
      - b. Average Fixed Costs (AFC) =  $TFC / \text{Output}$
    - 2. Variable Costs
      - a. Total Variable: Costs for which the total varies as output changes
      - b. Average variable Costs (AVC)
        - (1)  $TVC / \text{Output}$
        - (2) Constant
    - 3. Explicit vs. Implicit Costs
    - 4. Opportunity Costs: Costs foregone by not engaging in an alternative activity
    - 5. Economic Cost: Income an entity must provide to attract resource suppliers
    - 6. Economic Profit
      - a. Total revenue less all economic costs (Total revenue less costs of land, labor, and capital)
      - b. Difference from accounting is that accountants do not subtract the cost of investors' capital
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7. “Marginal” Concepts: Economic decisions are based upon marginal analyses of output, revenue, costs, and profits
    - a. Marginal Revenue: Revenue provided by selling an additional unit of product (incremental)
    - b. Marginal Cost: Cost of producing an additional unit of output (incremental)
    - c. Marginal Profit: Marginal revenue less marginal costs
    - d. Marginal Product: Additional output obtained by adding one more unit of an input
    - e. Marginal Revenue Product: Additional revenue provided by using one more unit input
    - f. Marginal Resource Cost: Change in total cost of a resource from using one more unit of resource
  8. Diminishing Returns
    - a. Experienced when additional units of variable inputs contribute less and less to total production
    - b. Marginal production is declining

**Example 5: Diminishing Returns**

If the 100<sup>th</sup> unit of input results in an increase in output of 150 and the 101<sup>st</sup> unit results in an increase of 145 units of output, then the entity is experiencing diminishing returns.

- C. Maximum Profits: Optimal use occurs when Marginal Revenue = Marginal Cost, regardless of market structure
- D. Firm should demand additional resources until Marginal Revenue Product = Marginal Resource Cost

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Explicit vs. Implicit  
Actual vs. Opportunity

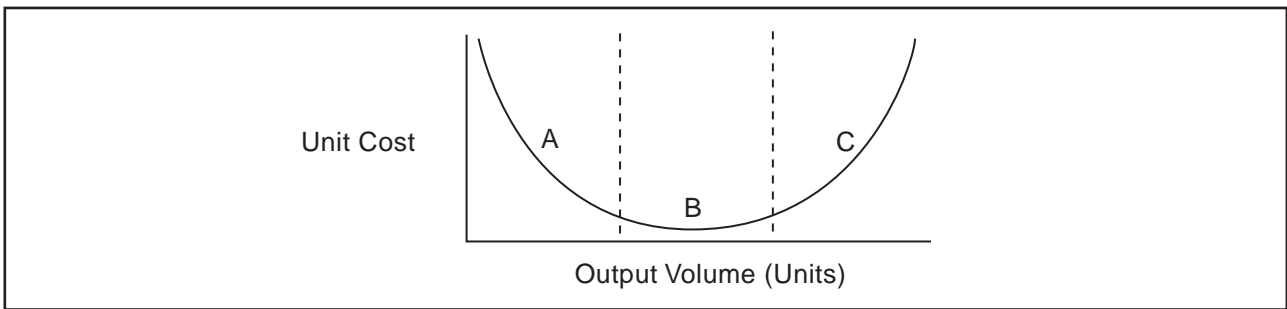
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E. Long-Run Cost Curve

1. U-shaped

- a. Initially, companies normally experience economies of scale (average costs decrease)
- b. Eventually, companies normally experience diseconomies of scale (average costs increase)

**Exhibit 11: Long-Run Cost Curve**



- 2. Economies of scale result from
  - a. Increased specialization/division of labor
  - b. Better use and specialization of management
  - c. Use of more efficient machinery
- 3. Diseconomies of scale tend to result from the difficulty of managing a large scale entity

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# MARKET STRUCTURES

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A. Pure Competition

1. Assumptions

- a. Large number of buyers and sellers
- b. Homogenous (standardized) product
- c. Free entry/exit
- d. Perfect information
- e. No price controls
- f. No non-price competition

2. Short Run: Producer is a price taker

3. Long Run

- a. No economic profits
- b. Allocation of resources is optimal because price = marginal cost

4. Produce quantity such that average cost is at its lowest

5. Market price=marginal revenue=average revenue

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B. Pure Monopoly

1. Example: Telephone service in U.S. used to be an example
  2. Assumptions
    - a. Single seller
    - b. Unique product
    - c. Blocked entry
    - d. Perfect information
    - e. Significant price controls
    - f. Goodwill advertising
  3. Profit Maximization
    - a.  $MR = MC$
    - b. Unless price is less than average cost (then, would cease production)
  4. Short Run
    - a. Demand is sloped negatively
    - b. Marginal revenue is less than demand and is sloped negatively
  5. Long Run
    - a. Blocked entry allows entity to earn an economic profit
    - b.  $P$  is greater than  $MC$ , so under-allocation of resources
    - c. Production is less than ideal
    - d. Price is higher and output lower than in a competitive market
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C. Monopolistic Competition

1. Example: Cell phone service
2. Assumptions
  - a. Large number of firms
  - b. Differentiated products
  - c. Relatively easy entry into market
  - d. Some price controls
  - e. Considerable non-price competition (brands, advertising)
3. Profit Maximization
  - a.  $MR = MC$
4. Short Run
  - a. Demand is sloped negatively, but <than in a pure monopoly (i.e., more elastic)
  - b. Marginal revenue is less than demand and is sloped negatively
5. Long Run
  - a. Limited entry allows entity to earn a normal profit (not an economic profit)
  - b.  $P$  is greater than  $MC$ , so under-allocation of resources
  - c. Production is less than ideal
    - (1) Price is higher and output lower than in a competitive market
    - (2) Price is lower and output higher than in monopoly

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D. Oligopoly

1. Examples: Airplane Manufacturing/Airline Service
2. Assumptions
  - a. Few sellers
  - b. Barriers to entering the market
    - (1) Natural (cost advantage)
    - (2) Created (advertising/patents)
  - c. Rivals actions are observed
  - d. Differentiated or standardized products
3. Price Leadership: Often occurs (sticky prices due to interdependence of firms)

E. Monopsony: One buyer exists for all sellers

*Independently answer questions 14-29.*

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## QUESTIONS

14. In the economic theory of production and cost, the short run is defined to be a production process

- a. Which spans a time period of less than 3 months in length.
- b. In which all inputs employed are variable.
- c. That is subject to economies of scale.
- d. In which both fixed and variable inputs are employed. (9911)

15. All of the following are true about perfect competition except that

- a. Firms are price takers.
- b. There are a large number of buyers and sellers.
- c. There is a standardized product.
- d. In the long run, an increase in profit will have no effect on the number of firms in the market. (9911)

16. All of the following are characteristics of monopolistic competition except that

- a. The firms sell a homogeneous product.
- b. The firms tend not to recognize the reaction of competitors when determining prices.
- c. Firms tend to earn normal profits.
- d. Price is higher than in pure competition. (9911)

17. An industry that is oligopolistic would be best characterized by

- a. Many firms selling unique products.
- b. A single firm selling a unique product.
- c. Significant barriers to entry.
- d. Horizontal or flat demand curves for the output of individual firms. (9911)

18. Which one of the following examples best depicts the law of diminishing returns?

- a. A small furnace is less efficient than a large furnace.
- b. A manufacturing company purchases its supplier of materials.
- c. At the No-Place-Like-Home restaurant, four cooks can prepare 160 meals in an evening while 3 cooks can prepare 150 meals.
- d. John's Landscaping can mow an acre in 10 minutes and 2 acres in 15 minutes. (7162)

19. A corporation's net income as presented on its income statement is usually

- a. Less than its economic profits because opportunity costs are considered in calculating net income.
- b. More than its economic profits because economists consider interest payments to be costs.
- c. Equal to its economic profits.
- d. Higher than its economic profits because opportunity costs are not considered in calculating net income. (7218)

20. The competitive model of supply and demand predicts a long-run shortage only when

- a. Maximum price is set above the equilibrium price.
- b. Maximum price is set below the equilibrium price.
- c. Minimum price is set above the equilibrium price.
- d. Minimum price is set below the equilibrium price. (7156)

21. Clegg Company's average cost is decreasing over a range of increased output. What is Clegg experiencing?

- a. Decreasing fixed costs
- b. Economies of scale
- c. Technological efficiency
- d. Decreasing returns (7165)

22. A monopolist tends to, in comparison with firms in a perfectly competitive market

- |                                     | <u>Produce</u> | <u>Sell at</u> |        |
|-------------------------------------|----------------|----------------|--------|
| a.                                  | Same           | Higher         |        |
| b.                                  | More           | Higher Price   |        |
| c.                                  | Less           | Lower          |        |
| <input checked="" type="radio"/> d. | Less           | Higher Price   | (9911) |

23. How does a company maintain a natural monopoly?

- a. Owning patents
- b. Owning natural resources
- c. Technological or economic conditions permit only one efficient supplier
- d. Entry and exit barriers exist
- e. The government limits entry into the market by competitors (7173)

24. Companies in monopolist and monopolistic competitive markets maximize profits when

- a. Average costs are minimized
- b. Marginal cost equals marginal revenue
- c. Price equals marginal costs
- d. Where total revenue is maximized (7174)

Items 25 through 27 are based on the following information.

<u>Total Number of Workers</u>	<u>Product (Units)</u>	<u>Average Selling Price</u>
20	40	\$75.00
21	45	69.00
22	48	67.50

25. The marginal physical product when one worker is added to a team of 20 workers is

- a. 2 unit.
- b. 3 units.
- c. 5 units.
- d. 45 units. (7224)

26. The marginal revenue per unit when one worker is added to a team of 21 workers is

- a. \$ 45.00
- b. \$105.00
- c. \$135.00
- d. \$ 67.50 (7222)

27. The marginal revenue product when one worker is added to a team of 21 workers is

- a. \$ 72.00
- b. \$105.00
- c. \$135.00
- d. \$ 67.50 (7223)

$$45 \times 69 = 3,105$$

$$48 \times 67.50 = 3,240$$

$$135$$

$$135/3=45$$

Items 28 and 29 are based on the following information.

Total Units of Product	Average Fixed Cost	Average Variable Cost	Average Total Cost
6	\$16.67	\$27.00	\$43.67
7	\$14.29	\$25.00	\$39.29
8	\$12.50	\$24.50	\$37.00
9	\$11.11	\$24.25	\$35.36

28. The total cost of producing seven units is

- a. \$100.00
  - b. \$175.00
  - c. \$275.03
  - d. \$296.00
- (1911)

$$7 \times 39.29 = 275.03$$

29. The marginal cost of producing the ninth unit is

- a. \$24.50
  - b. \$24.35
  - c. \$22.24
  - d. \$35.36
- (9911)

$$8 \times 37 = 296$$

$$9 \times 35.36 = 318.24$$

$$22.24$$