Lecture 1 Notes

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June 15, 2021

1. Economics — The study of how people manage scarce resources to achieve their goals
2. Economic Groups:
   (a) Individuals, Households, and Consumers — Consume goods or services and provide factors of production
      i. Goals: Maximize utility from consuming goods or services and providing factors of production
      ii. Resources: Income to purchase goods or services, time
   (b) Firms, Entrepreneurs, Businesses, Companies, and Producers — Produce goods or services and use factors of production
      i. Goals: Maximize profit from producing and selling goods or services and using factors of production
      ii. Resources: Labor, Natural Resources, Capital, and Entrepreneurship
   (c) Governments — Spend their budget to implement their policies or social welfare programs
      i. Goals: Maximize the well-being of consumers and producers
      ii. Resources: Budget
3. Three Economic Assumptions:
   (a) People are rational
      i. People make decisions to achieve their highest goals given scarce resources and available information
      ii. Economists assume that people are rational on average even though not everyone behaves rationally
      iii. Ex. Individuals consume goods or services to maximize their utility given income and prices of goods or services
   (b) People respond to incentives

i. An incentive is something that causes a change in the trade-offs that people face

ii. Incentive involves total benefit and total cost

A. Total Benefit — Total amount of gain by doing the activity

B. Total Cost — Total amount paid or forfeited to do the activity

iii. Positive incentives makes people do more of an activity, while negative incentives (disincentives) decrease likelihood of performing an activity

(c) People make marginal decisions

i. Rational people make decisions by comparing marginal benefit to marginal cost

A. Marginal Benefit is the benefit of performing an additional unit of an activity: $B_M = \frac{TB_1 - TB_0}{Q_1 - Q_0}$, where TB_1 is the new total benefit, TB_0 is the old total benefit, Q_1 is the new amount of activity, and Q_0 is the old amount of activity

B. Marginal Cost is the cost of performing an additional unit of an activity: $C_M = \frac{TC_1 - TC_0}{Q_1 - Q_0}$, where TC_1 is the new total cost, TC_0 is the old total cost, Q_1 is the new amount of activity, and Q_0 is the old amount of activity

ii. Decision criteria depends on how much of an activity people take to maximize net benefit ($TB - TC$)

A. If $B_M > C_M$, more of an activity should be done to increase net benefit

B. If $B_M < C_M$, less of an activity should be done to increase net benefit

C. If $B_M = C_M$, the level of activity should be maintained to keep benefit in equilibrium

iii. This process is known as the **marginal decision-making process**

4. **Scarcity**:

(a) Peoples' wants are unlimited or infinite, but resources are limited, scarce, or finite

(b) Peoples' wants are constrained by scarce resources

(c) People need to make a choice among alternatives

(d) Ex. Individuals need to make a choice among different products given income

5. **Trade-off**:

(a) A trade-off occurs when people forfeit one activity to do another activity or when people give up more of one activity to get more of another activity

(b) Ex. The U.S. Government reduces its spending on education and social welfare to raise its defense spending

6. **Opportunity Cost**:

(a) The opportunity cost is the value of the second-best option given up to choose the best option

(b) It is the quantitative measure of trade-off relationships among alternative options

(c) Economists often express opportunity cost as a dollar value to compare alternatives

(d) Not all opportunity costs are measured in dollar or monetary values

(e) Ex. Toyota can produce 2 Corollas or 1 Camry with the same resources. What is the opportunity cost of 1 Camry? 2 Corollas

7. **Efficiency**:

   (a) Efficiency occurs when resources are used to create the greatest economic value within a society

   (b) Productive efficiency occurs when goods or services are produced at the minimum cost or when goods or services are produced to maximize profit

   (c) Allocative efficiency occurs when goods or services produced satisfy consumers' preferences most or when consumers obtain goods or services to maximize their efficiency

8. **Economic Growth**:

   (a) Economic growth is an increase in the production of goods or services

   (b) Three ways to obtain economic growth exist:

      i. Increase resources (labor, capital, natural resources, and entrepreneurship)

      ii. Technological advancement (progress) or positive technological change or innovation

      iii. Specialization and trade — Gains from trade with the right terms of trade

9. **Economic Model**

   (a) A simplified representation or version of a real economic phenomenon (situation)

   (b) Focuses on essentials of the complex reality by simplifying through assumptions, getting useful and approximate answers to economic problems, and obtaining predictions for the future

   (c) May be expressed in three ways: words, graphs, and equations

   (d) Ex. Circular flow model (words and diagrams) and Production possibilites frontier (in words, graphs, and equations)

10. Characteristics of a good model

    (a) Makes clear and reasonable assumptions (based on economic theory and data)

(b) Predicts cause and effect relationship among economic variables (focuses on causal relationship between two economic variables, assuming all else to be constant)

(c) Accurately describes the real world (data)

i. Does not need to include all complex details from reality

ii. Needs to approximately replicate reality

11. Developing a good economic model

(a) Make reasonable assumptions based on theory

(b) Formulate a testable hypothesis[1]

(c) Test a hypothesis through data collection and statistical models: null hypothesis (the hypothesis one wants to accept) and alternative hypothesis (hypothesis one wants to reject)

(d) Revise the model by changing assumptions, data, or both if the null hypothesis is rejected

(e) Use the revised model to explain or predict economic events

12. Developing a demand model

(a) Assume that everything else is constant, other than the price of a specific product

(b) Theoretical model: $P = a + bQ_d$, where P is price, and Q_d is the quantity determined

(c) Null hypothesis (H_0): There is a negative relationship between price and quantity determined ($b < 0$)

(d) Alternative hypothesis (H_A): There is either no relationship or a positive relationship between the price and quantity determined ($b \geq 0$)

(e) Statistical model: $P = a + bQ_d + \varepsilon$, where ε is the error term

(f) Collect data on price and quantity demanded to estimate b

(g) If data rejects the null hypothesis, revise the model by changing data or assumptions. Collect data once again on price and quantity demanded to estimate b

(h) Ex. $P = 10 - 2Q_d$ — If the quantity demanded increases by 1, the price will decline by \$2, or, if the price rises by \$1, the quantity demanded will decline by .5

13. Economic Model Examples

(a) Basic Circular Flow Model

i. Assumptions

A. Two economic agents: households and firms

[1] A statement about causal relationships between two economic variables that may be true or not

B. Two markets: product market and factor market

ii. One of the most basic models that shows the flow of money, goods and services, and inputs

iii. In the product market, households spend money to buy goods and services that firms obtain revenue by making and selling

iv. In the factor market, households earn income (wage, rent, and profit) by providing inputs that firms pay for (cost) to produce goods and services

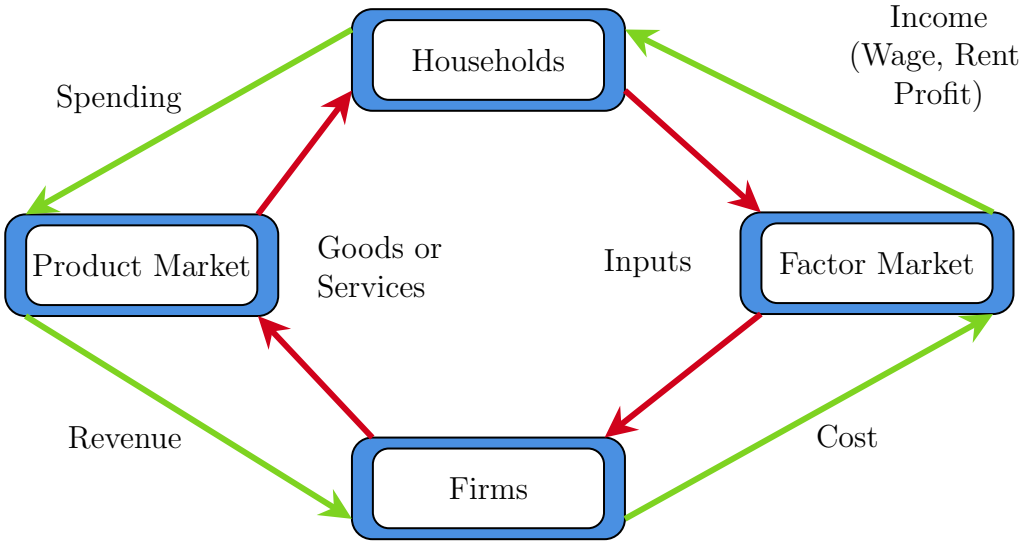

Figure 1: Example Basic Circular Flow Model

i. Missing Components

A. Missing economic agents: Governments

B. Missing markets: financial and international market

C. A modified circular flow model includes these components

(b) Production Possibilities Frontier (PPF)

i. A production possibilities frontier is a curve that shows the maximum attainable (feasible) combinations of two products (goods or services) that can be produced given resources and technology

ii. Assumptions:

A. There are only two products (goods or services)

B. Resources and technology are fixed

iii. This model can illustrate the aforementioned five basic economic concepts

iv. Two types of PPF exist:

A. Linear — Assumes all resources have the same efficiency in producing two products. Opportunity cost is constant at any point. The slope of PPF is equal to the marginal opportunity cost. Unrealistic but can be used for simplicity.
   - Scarcity — Any point on or below the line is feasible, while any point above the line is infeasible (due to lack of resources)
   - Trade-offs — Occur when an increase in the production of one product cause a reduction in the production of another product. A trade-off always occurs when moving from one efficient point to another, but only sometimes occur when moving from inefficient to inefficient or inefficient to efficient
   - Efficiency — An inefficient point is feasible, but below the line. An efficient point is anywhere along the line. An allocatively efficient point is any feasible point that satisfies consumer preferences or maximizes customer utility. Such points may not be represented on a PPF without consumer preferences
   - Opportunity Cost — The opportunity cost is measured by the number of the other good given up to choose the best option because there are only two options present on a PPF. The total opportunity cost is measured by the number of the other good given up to produce more of one good. Marginal opportunity cost is measured by the number of the other good given up to produce one more of one good (i.e. the slope)
   - Economic Growth — Economic growth can be demonstrated by an increase in the production of goods or services (i.e. a shift to the right of a PPF). Economic growth can occur for the aforementioned three reasons.
     - More resources — A parallel shift to the right occurs
     - Technological advancement — If the advancement is in the good on the Y-axis, the slope increases. If the advancement is in the good on the X-axis, the slope decreases. These are pivotal shifts. If the advancement occurs equally with respect to both goods, a parallel, rightwards shift occurs

B. Concave — Assumes that each resource has different efficiency in production. The marginal opportunity cost (slope) is increasing. More (though not completely) realistic than the linear counterpart

14. Positive vs. Normative

(a) Positive Analysis

i. A factual claim about causal relationships between two economic variables (hypothesis)

ii. It is testable through data and statistical model(s)

iii. Ex. Higher minimum wage will raise unemployment

(b) Normative Analysis

i. A claim on how the world should be based on beliefs, political views, and values

ii. It is not testable through data and statistical model(s)

iii. A positive statement may help to form a normative statement

iv. Ex. Minimum wage should be raised to raise the income of the low-skilled (educated) workers

15. Microeconomics vs. Macroeconomics

(a) Microeconomics

i. A study of how households and firms make decisions, how they interact in the market, and how the government influences their decisions

ii. Microeconomic variables include the prices, quantity demanded, and quantity supplied of a specific product

iii. Microeconomic model includes demand and supply model for a specific product

iv. Microeconomic policies include price control, excise tax, trade policies, anti-trust laws, price regulation, and environmental policies

(b) Macroeconomics

i. A study of the economy as a whole and how policy-makers manage the growth and behavior of the overall economy

ii. Macroeconomic variables include total production (GDP), price level, inflation, economic growth rate, and unemployment

iii. Macroeconomic model includes aggregate demand and aggregate supply

iv. Macroeconomic topics include business cycle and economic growth

v. Macroeconomic policies include fiscal and monetary policies

16. What is a Market?

(a) A market is a place where a group of buyers and sellers come together to trade any specific product (good, service, input, or financial asset)

(b) Always two sides of the market:

i. The demand represents the buyers' side

ii. The supply represents the sellers' side

(c) In the market, buyers and sellers interact with each other and determine price and quantity for a specific product

(d) As a result, the demand and supply model is used in analyzing the market

17. Types of Markets:

(a) Location-Based
    i. Physical Markets
        A. Farmers' Market
        B. Shopping Mall (e.g. Sun Valley Mall)
        C. Book Stores (e.g. Barnes & Noble)
        D. Grocery Stores (e.g. Safeway, Walmart, Costco)
    ii. Virtual Markets
        A. eBay, Amazon, Kindle

(b) Product-Based
    i. Goods or services are traded in the product market
    ii. Goods are tangible products such as cars, books, notes, gold, etc.
    iii. Services are intangible products such as financial services, airline services, education, etc.
    iv. Households are buyers of goods or services, and firms are sellers of goods or services
    v. Households spend money to purchase goods or services, but firms earn a profit by selling goods or services

(c) Factor-Based
    i. Inputs are traded in the factor market
    ii. Labor includes full-time, part-time, regular, or temporary workers, and is measured by working hours
    iii. Capital is a product itself but also used as inputs and includes machines, tools, and buildings
    iv. Natural resources include land, oil, water, air, etc
    v. Entrepreneurships are skills, abilities, and knowledge of managers
    vi. Firms are buyers but households are sellers of inputs

(d) Financial-Based
    i. Financial assets are traded in the financial market
    ii. Financial assets include checking and saving accounts, stocks, bonds, mutual funds, insurance, etc.
    iii. Borrowers of funds are buyers of financial assets, while savers or lenders are sellers of financial assets
    iv. This market is not included in the basic circular flow model, but will be in the modified one
    v. Financial assets (capital) is not included in inputs, but physical capital is included in inputs

(e) Demand and supply model is used to analyze markets

(f) Demand shows the relationship between price and quantity demanded of a specific product

(g) Demand model can be expressed in words (law of demand), in a table (demand schedule), or in a graph (demand curve)

18. The Law of Demand

(a) This law describes the relationship between price and quantity demanded of a specific product

(b) There is an inverse (negative) relationship between price and quantity demanded of a product, ceteris paribus[2]

(c) The quantity demanded (Q_d) is the amount of a product that buyers are willing and able to buy

(d) Negative relationship means that, with a higher price, the quantity demanded will decline, and vice versa

19. Why does the law of demand hold?

(a) Increasing marginal opportunity cost — With higher price, a product will become more expensive than other substitutes and consumers buy less of it

(b) Diminishing marginal utility — With higher quantity demanded, consumers will pay less for additional units due to lower marginal utility

(c) Exception: A Giffen good is a good that has a positive relationship between price and quantity demanded, which violates this law

20. Demand Schedule

(a) An individual demand schedule is a table that shows the relationship between price and individual quantity demanded of a product, ceteris paribus

(b) Individual quantity demanded is a quantity demanded of a product for only one consumer

(c) Market demand schedule is a table that shows the relationship between price and the market quantity demanded of a product, ceteris paribus

(d) Market quantity demanded is the sum of individual quantity demanded or the quantity demanded of a product for the whole market

21. Demand Curves

(a) Individual demand curves are graphs or figures that show the relationship between price and individual quantity demanded of a product, ceteris paribus

(b) Market demand curves are graphs or figures that show the relationship between price and market quantity demanded of a product, ceteris paribus

[2]Holding all else constant (in latin)

(c) Market demand curves are the horizontal sums of individual demand curves at a given price

(d) Market demand curves are assumed to be linear because they are mostly linear for buyers

22. Non-price factors that shift demand

    (a) There are five major factors other than the price that influence the demand of a product:

        i. Income
        ii. Preference (Taste)
        iii. Prices of substitutes
        iv. Number of buyers
        v. Expected price of a product

23. How each factor influences demand

    (a) Income

        i. Consumers' income will affect the demand of a product in different ways depending on the type of product
        ii. A product is a normal good if increase in income of consumers will increase the demand of that product and vice versa
        iii. There is a positive relationship between income and demand, ceteris paribus
        iv. Most goods are normal (e.g. New cars, lamps, laptops, etc.)
        v. A product is an inferior good if increase in income of a consumer will decrease the demand, and vice versa
        vi. There is a negative relationship between income and demand, ceteris paribus
        vii. Few goods are inferior (e.g. Used cars, instant noodles, fast food, etc.)

    (b) Preference (Taste)

        i. Change in preference, or the like or dislike towards a product, affects the demand in various ways
        ii. In economics, we only care about how peoples' preferences affect their consumption behaviors, whereas sociology may care about how preferences change
        iii. There are a variety of factors that influence consumers' preferences — Health concerns, advertising, outbreak of disease, research results, etc.
        iv. Ex. High obesity rates lower the demand for high fat products, but increase the demand for low fat products

    (c) Prices of substitutes

        i. Substitutes are products that can replace each other because of similar usages
        ii. The rise in the price of a substitute will increase the demand for a product, and vice versa

iii. There is a positive relationship between the price of a substitute and demand for a product
iv. Ex. Competition between Iphones, Samsung Galaxy, and Pinephones
v. Complements are products that can be consumed together
vi. The rise in the price of a complement will decrease the demand for a product, and vice versa
vii. There is a negative relationship between the price of a complement and demand for the product
viii. Ex. Peanut Butter and Jelly
ix. Unrelated products have no relationship at all
x. Ex. Laptop and Refrigerator

(d) Number of buyers

i. An increase in the number of buyers will increase the (market) demand for a product
ii. There is a positive relationship between number of buyers and demand, ceteris paribus
iii. There are a variety of factors that influence number of buyers:
A. Birth and Death rates
B. Migration among regions
C. Immigration among countries
D. Change in demographics
iv. Ex. Increase in birth rate would result in an increase in the demand for birthing centers

(e) Expected (future) price of a product

i. If the price of a product is expected to rise in the future, the current demand for a product will rise, but the future demand will fall, and vice versa
ii. There is a positive relationship between the expected price and current demand for a product, ceteris paribus
iii. Ex. Expected rise in an airline ticket price during summer will increase the demand during spring

24. Change in quantity demanded (Q_d) vs. demand (D)

(a) Change in Q_d occurs when Q_d changes as a result of change in the price of a product, ceteris paribus

(b) Change in Q_d shows the movement along the demand curve or the movement from one point to another on the demand curve

(c) Decrease in Q_d occurs as a result of rise in the price of a product, ceteris paribus, which can be shown as the upward movement along the demand curve

(d) Increase in Q_d occurs as a result of decrease in the price of a prodcut, ceteris paribus, which can be shown as the downward movement along the demand curve

(e) Change in D occurs when Q_d changes as a result pf change in one of the non-price factors

(f) Change in D shows the shift in the demand curve or the change in Q_d at each given price

(g) Decrease in demand occurs when Q_d decrease at each given price, which can be shown as shifting demand to the left

(h) Increase in demand occurs when Q_d increases at each given price, which can be shown as shifting demand to the right

25. Supply

(a) Supply represents the sellers' side

(b) Supply shows the relationship between price and quantity supplied of a specific product

(c) Supply model can be expressed in words (Law of Supply), in a table (supply schedule), or in a graph (supply curve)

26. Law of Supply

(a) A law that describes the relationship between price and quantity supplied of a specific product

(b) There is a positive relationship between price and quantity supplied of a product, ceteris paribus

(c) The quantity supplied (Q_s) is the amount of a product that sellers are willing and able to provide

27. Why does the law of supply hold?

(a) Increasing profit — With higher price, a product will become more profitable than other products and sellers offer more of it, and vice versa

(b) Increasing marginal opportunity cost (marginal cost) — With higher quantity supplied of a product, producers will cost more to produce additional units and charge more for it, and vice versa

28. Supply Schedule

(a) An individual supply schedule is a table that shows the relationship between price and individual quantity supplied of a product, ceteris paribus

(b) Individual quantity supplied is a quantity supplied of a product for only one seller

(c) Market supply schedule is a table that shows the relationship between price and the market quantity supplied of a product, ceteris paribus

(d) Market quantity supplied is the sum of individual quantity supplied or the quantity supplied of a product for the whole market

29. Supply Curve

    (a) Individual supply curves are graphs or figures that show the relationship between price and individual quantity supplied of a product, ceteris paribus

    (b) Market supply curves are graphs or figures that show the relationship between price and market quantity supplied of a product, ceteris paribus

    (c) Market supply curves are the horizontal sums of individual supply curves at a given price

    (d) Market supply curves are assumed to be linear because they are approximately linear for many sellers, even though few sellers are not

30. Non-price factors that shift supply

    (a) Technology

    (b) Prices of inputs

    (c) Prices of other products

    (d) Number of sellers

    (e) Expected price of a product

31. How each factor influences supply

    (a) Technology

        i. With positive technological change (progress), more may be supplied
        ii. Sellers can make more of a product (higher quantity supplied) given resources
        iii. There is a positive relationship between innovation and supply, ceteris paribus
        iv. Ex. More efficient assembly of a Pinephone
        v. With negative technological change, less of a quantity may be supplied
        vi. There is a negative relationship between negative technological change and supply, ceteris paribus
        vii. Ex. Use of deprecated equipment or tools

    (b) Prices of inputs

        i. The rise in the price of an input will lower the supply of a product due to higher cost of production, and vice versa
        ii. There is a negative relationship between price of inputs and supply, ceteris paribus
        iii. Ex. Silicon shortage for Pine64

    (c) Prices of substitutes

i. Substitutes are products that can replace one another by a seller
ii. The rise in the price of a substitute will decrease the supply of a product and vice versa
iii. There is a negative relationship between price of a substitute and supply for a product
iv. Ex. Tablet and Laptop
v. Complements are products that can be produced together by a seller
vi. The rise in the price of a complement will increase the supply of a product and vice versa
vii. There is a positive relationship between price of a complement and supply for a product
viii. Ex. Oil and Natural Gas

(d) Number of sellers

i. Increase in the number of sellers will increase the (market) supply for a product because the market quantity supplied of a product will rise, and vice versa
ii. There is a positive relationship between number of sellers and supply, ceteris paribus
iii. There are several factors that influence the number of sellers — Profitability and barriers to entry and exit
   A. Positive profit will attract new firms to enter the market and increase the supply of a product
   B. Negative profit (loss) will make some existing firms leave the market and lower the supply of a product
   C. High degree of barriers to entry or exit will make it harder to change the number of sellers, whereas low degree of barriers to entry or exit will make it easier to change the number of sellers
   D. Perfectly competitive markets and monopolistically competitive markets have no barriers to entry and exit, but a monopoly market has the strongest barriers, while an oligopoly market has some degree of barriers
iv. Ex. Barriers to entry — Tax benefits, patents, strong brands, etc.
v. Ex. Barriers to exit — Asset write-offs, closure costs, etc.

(e) Expected price of a product

i. The rise in the expected price of a product will lower the current supply of that product, but increase the future supply of a product, ceteris paribus, and vice versa
ii. There is a negative relationship between the expected price and the current supply, ceteris paribus
iii. The rise in the price of an airline ticket during the summer will decrease the supply for an airline ticket during spring

32. Change in quantity supplied (Q_s) vs. supply (S)

    (a) Change in Q_s occurs when Q_s changes as a result of a change in the price of a product, ceteris paribus

    (b) Change in Q_s shows the movement along the supply curve or the movement from one point to another on the supply curve

    (c) Decrease in Q_s occurs as a result of a decrease in the price of a product, ceteris paribus, which can be shown as the downward movement along the supply curve

    (d) Increase in Q_s occurs as a result of an increase in the price of a product, which can be shown as the upward movement along the supply curve

    (e) Change in S occurs when Q_s changes as a result of a change in one of the non-price factors, ceteris paribus

    (f) Change in S shows the shift in the supply curve or the change in Q_s at each given price

    (g) Decrease in supply occurs when Q_s decreases at each given price, which can be shown as shifting the supply to the left

    (h) Increase in supply occurs when Q_s increases at each given price, which can be shown as shifting the supply to the right

33. Market Disequilibrium

    (a) A situation where there is an incentive to change (deviate) in the market

    (b) There are two cases of disequilibrium: surplus and shortage

    (c) Surplus (excess supply) is a situation where the quantity supplied (Q_s) is greater than the quantity demanded (Q_d) at a price greater than equilibrium price

        i. Sellers want to sell more than buyers want to purchase, and has an incentive to lower the price to raise their revenue

    (d) Shortage (excess demand) is a situation where the quantity supplied (Q_s) is less than the quantity demanded (Q_d) at a price less than equilibrium price

        i. Buyers want to buy more than sellers want to sell, and has an incentive to raise the price to increase their revenue

    (e) With a surplus, sellers want to lower the price to equilibrium price, whereas, with shortages, sellers want to raise the price to equilibrium price

    (f) Eventually, the market transitions from disequilibrium to equilibrium by changing the price, which is the "Invisible hand" referenced by Adam Smith

34. Market Equilibrium

    (a) A situation in which there is no incentive for deviation in the market

    (b) At market equilibrium:

i. Demand curve intersects supply curve
ii. Quantity supplied (Q_s) = Quantity demanded (Q_d)
iii. Every seller who wants to provide a product finds buyers who want to purchase it at the equilibrium price (known as Market Clearing)
iv. There is neither a surplus nor shortage

35. Change in Market Equilibrium

(a) Change in the market conditions occurs when non-price factors that shift demand or supply change

(b) There are three different cases of the market condition changes

i. Shift in only demand
ii. Shift in only supply
iii. Shift in both demand and supply

(c) Shift in only demand

i. Increase in demand or shifting the demand to the right will increase both the equilibrium price and quantity
ii. Decrease in demand of shifting the demand to the left will lower both the equilibrium price and quantity

(d) Shift in only supply

i. Increase in supply or shifting the supply to the right will decrease the equilibrium price but increase the equilibrium quantity
ii. Decrease in supply or shifting the supply to the left will increase the equilibrium price but decrease the equilibrium quantity

(e) Shift in both supply and demand

i. Increase in both supply and demand will increase the equilibrium quantity, but may increase, decrease, or keep the equilibrium price
ii. Decrease in both supply and demand will decrease the equilibrium quantity, but may increase, decrease, or keep the equilibrium price
iii. Increase in supply and decrease in demand will decrease the equilibrium price, but may increase, decrease, or keep the equilibrium quantity
iv. Decrease in supply and increase in demand will increase the equilibrium price, but may increase, decrease, or keep the equilibrium quantity