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 Q1: Explain the following concepts.

1. The benefit principle
2. Lump- sum Taxes
3. Marginal tax rate versus average tax rates
4. Proportional tax
5. Regressive tax
6. Progressive tax

**Ans :**

**benefit principle**

The **benefit principle** is a concept in the [theory of taxation](https://en.wikipedia.org/wiki/Theory_of_taxation) from [public finance](https://en.wikipedia.org/wiki/Public_finance). It bases taxes to pay for [public-goods](https://en.wikipedia.org/wiki/Public_good_%28economics%29) [expenditures](https://en.wikipedia.org/wiki/Public_expenditure) on a politically-revealed [willingness to pay](https://en.wikipedia.org/wiki/Willingness_to_pay) for benefits received. The principle is sometimes likened to the function of [prices](https://en.wikipedia.org/wiki/Price_mechanism) in [allocating](https://en.wikipedia.org/wiki/Resource_allocation) [private goods](https://en.wikipedia.org/wiki/Private_good).

**lump-sum tax**

A **lump-sum tax** is a special way of [taxation](https://en.wikipedia.org/wiki/Tax), based on a fixed amount, rather than on the real circumstance of the taxed entity.

Marginal Tax Rate

The [marginal tax rate](https://www.investopedia.com/terms/m/marginaltaxrate.asp) is the rate of tax income earners incur on each additional dollar of income. As the marginal tax rate increases, the taxpayer ends up with less money per dollar earned than he or she had retained on previously earned dollars

**average tax rates**

The average tax rate is the percent of taxes divided by taxable income. Because of the U.S.’s [progressive tax system](https://www.bankrate.com/glossary/p/progressive-tax/), people pay different percentages of tax the higher their income gets. The average tax rate helps them figure out how much tax was paid overall.

 **proportional tax**

A **proportional tax** is a [tax](https://en.wikipedia.org/wiki/Tax) imposed so that the [tax rate](https://en.wikipedia.org/wiki/Tax_rate) is fixed, with no change as the taxable base amount increases or decreases. The amount of the tax is in proportion to the amount subject to taxation.

Regressive tax

A regressive tax is a tax applied uniformly, taking a larger percentage of income from low-income earners than from high-income earners. It is in opposition to a [progressive tax](https://www.investopedia.com/terms/p/progressivetax.asp), which takes a larger percentage from high-income earners.

**progressive tax**

A **progressive tax** is a [tax](https://en.wikipedia.org/wiki/Tax) in which the [tax rate](https://en.wikipedia.org/wiki/Tax_rate) increases as the taxable amount increases . The term "progressive" refers to the way the tax rate progresses from low to high, with the result that a taxpayer's [average tax rate](https://en.wikipedia.org/wiki/Average_tax_rate) is less than the person's [marginal tax rate](https://en.wikipedia.org/wiki/Marginal_tax_rate) .

Q2: Define elasticity and explain the following elasticity concepts.

1. Income elasticity
2. Price elasticity
3. Cross price elasticity of demand

Ans :

Elasticity

[Elasticity](https://www.investopedia.com/terms/e/elastic.asp) is a measure of a variable's sensitivity to a change in another variable, most commonly this sensitivity is the change in price relative to changes in other factors. In business and economics, elasticity refers to the degree to which individuals, consumers or producers change their demand or the amount supplied in response to price or income changes .

 **income elasticity of demand**

In economics, the **income elasticity of demand** is the responsiveness of the quantity demanded for a good to a change in consumer income. It is measured as the ratio of the percentage change in quantity demanded to the percentage change in income. If a 10% increase in Mr. Smith's income causes him to buy 20% more bacon, Smith's income elasticity of demand for bacon is 20%/10% = 2.

**Price elasticity of demand**

is the degree to which the effective desire for something changes as its price changes. In general, people desire things less as those things become more expensive. However, for some products, the customer's desire could drop sharply even with a little price increase, and for other products, it could stay almost the same even with a big price increase. Economists use the term elasticity to denote this sensitivity to price increases. More precisely, price elasticity gives the percentage change in quantity demanded when there is a one percent increase in price, holding everything else constant.

cross [elasticity of demand](https://www.investopedia.com/ask/answers/040315/what-factors-influence-change-demand-elasticity.asp)

The is an economic concept that measures the responsiveness in the quantity demanded of one good when the price for another good changes. Also called cross-price elasticity of demand, this measurement is calculated by taking the percentage change in the quantity demanded of one good and dividing it by the percentage change in the price of the other good.

**Q3: (a) Define Monopoly and explain characteristics of Monopoly?**

**Ans :**

 'Monopoly'

A market structure characterized by a single seller, selling a unique product in the market. In a monopoly market, the seller faces no competition, as he is the sole seller of goods with no close substitute.

 Four Characteristic of monopoly

1. Single seller and a lot of purchasers:

Monopoly is a form of not perfect market structure because the produce the goods and give the services is by one single seller or monopolist. A price of goods and service is also fully control by one seller. Therefore, if the prices of the goods rise up, consumers need to accept and pay higher prices to buy the goods and service because the monopoly market are fully control and produce the goods and service by one single monopolist. So, consumers do not have choice to choose goods from other company or industries. Monopolist can maximize the profit in the long run.

2. Unique goods

Monopoly market producing unique goods, there does not have close substitutes in the market place. Monopoly market is freedom to change the cost of the goods or services. Example of Windows company, they are using their own idea to form their own goods and service, which is Microsoft. There do not have any other substitutes in this market.

3. High barriers to entry into monopoly market

A monopoly in the market is a strong barrier to enter the new or others industry. Monopoly does not face competition because do not have other competitor produce same product to enter the market. It is limit on others new industry and hard to enter in this monopoly market. Means other industries or company cannot easily to enter the market and given goods. Monopoly control over the production and sale of the goods to implement certain economic barriers are imposed to entry potential adversaries. A monopoly market needs a large start up costs to enter a monopoly market.

4. Specialized Information about production techniques

Monopoly is a common feature by control of production or information is not available given to others. Producer usually have specialized information such as patents, copyright over idea and trademark establish by law to sell the services or goods. The monopoly of resources or technique is only the company or industry can exploit it.

1. Discuss price determination under monopoly?

**Ans :**

PRICE-OUTPUT DETERMINATION UNDER MONOPOLY:

A firm under monopoly faces a downward sloping demand curve or average revenue curve. Further, in monopoly, since average revenue falls as more units of output are sold, the marginal revenue is less than the average revenue. In other words, under monopoly the MR curve lies below the AR curve.The Equilibrium level in monopoly is that level of output in which marginal revenue equals marginal cost. The producer will continue producer as long as marginal revenue exceeds the marginal cost. At the point where MR is equal to MC the profit will be maximum and beyond this point the producer will stop producing.

It can be seen from the diagram that up till OM output, marginal revenue is greater than marginal cost, but beyond OM the marginal revenue is less than marginal cost. Therefore, the monopolist will be in equilibrium at output OM where marginal revenue is equal to marginal cost and the profits are the greatest. The corresponding price in the diagram is MP’ or OP. It can be seen from the diagram at output OM, while MP’ is the average revenue, ML is the average cost, therefore, P’L is the profit per unit. Now the total profit is equal to P’L (profit per unit) multiply by OM (total output).

In the short run, the monopolist has to keep an eye on the variable cost, otherwise he will stop producing. In the long run, the monopolist can change the size of plant in response to a change in demand. In the long run, he will make adjustment in the amount of the factors, fixed and variable, so that MR equals not only to short run MC but also long run MC.

Q4: Discuss the following models.

1. The Cournot Model:

2. The Stackelberg Model:

**Ans :**

1. The Cournot Model:

Cournot competition is an economic model describing an industry structure in which rival companies offering an identical product compete on the amount of output they produce, independently and at the same time. It is named after its founder, French mathematician Augustin Cournot.

Understanding Cournot Competition

Companies operating in markets with limited competition, called [oligopolies](https://www.investopedia.com/terms/o/oligopoly.asp)*,* often compete by seeking to steal [market share](https://www.investopedia.com/terms/m/marketshare.asp)away from each other. One way to do this is to alter the number of goods sold.

According to the law of [supply and demand](https://www.investopedia.com/terms/l/law-of-supply-demand.asp), higher output drives down prices, while lower output raises them. As a result, companies must consider how much quantity a competitor is likely to churn out to have a better chance of maximizing [profits](https://www.investopedia.com/terms/p/profit.asp).

In short, efforts to maximize profit are based on competitors’ decisions and each firm’s output decision is assumed to affect the product price. The idea that one firm reacts to what it believes a rival will produce forms part of the [perfect competition](https://www.investopedia.com/terms/p/perfectcompetition.asp) theory.

The Cournot model is applicable when companies produce identical or standardized goods. It assumes they cannot collude or form a [cartel](https://www.investopedia.com/terms/c/cartel.asp), have the same view of market demand, and are familiar with competitor [operating costs](https://www.investopedia.com/terms/o/operating-cost.asp).

1. **The Stackelberg Model:**

Stackelberg model is a leadership model that allows the firm dominant in the market to set its price first and subsequently, the follower firms optimize their production and price. It was formulated by [Heinrich Von Stackelberg](https://en.wikipedia.org/wiki/Heinrich_Freiherr_von_Stackelberg) in 1934.

In simple words, let us assume a market with three players – A, B, and C. If A is the dominant force, then it will set the price of the product first up. Firms B and C will follow the price set and will accordingly adjust their production basis supply and demand patterns.

**Stackelberg Model Step By Step Calculations**

**Stackelberg Model Step By Step Calculations**

Following steps can help in solving a basic problem based on Stackelberg model:

* **Step1:** Write the demand function for the market.
* **Step 2:** Write the cost functions for both the firm’s A and B in the market.
* **Step 3:** The individual reaction functions in the [duopoly](https://www.wallstreetmojo.com/duopoly/) are found by taking the partial derivates of the profit function.
* **Step 4:** Assume firm A as a leader, obtain profit maximization equation for firm A substituting firm B’s profit function in firm A equation.
* **Step 5:** Solve for firm B as being the follower.