ECONOMICS

Elasticity

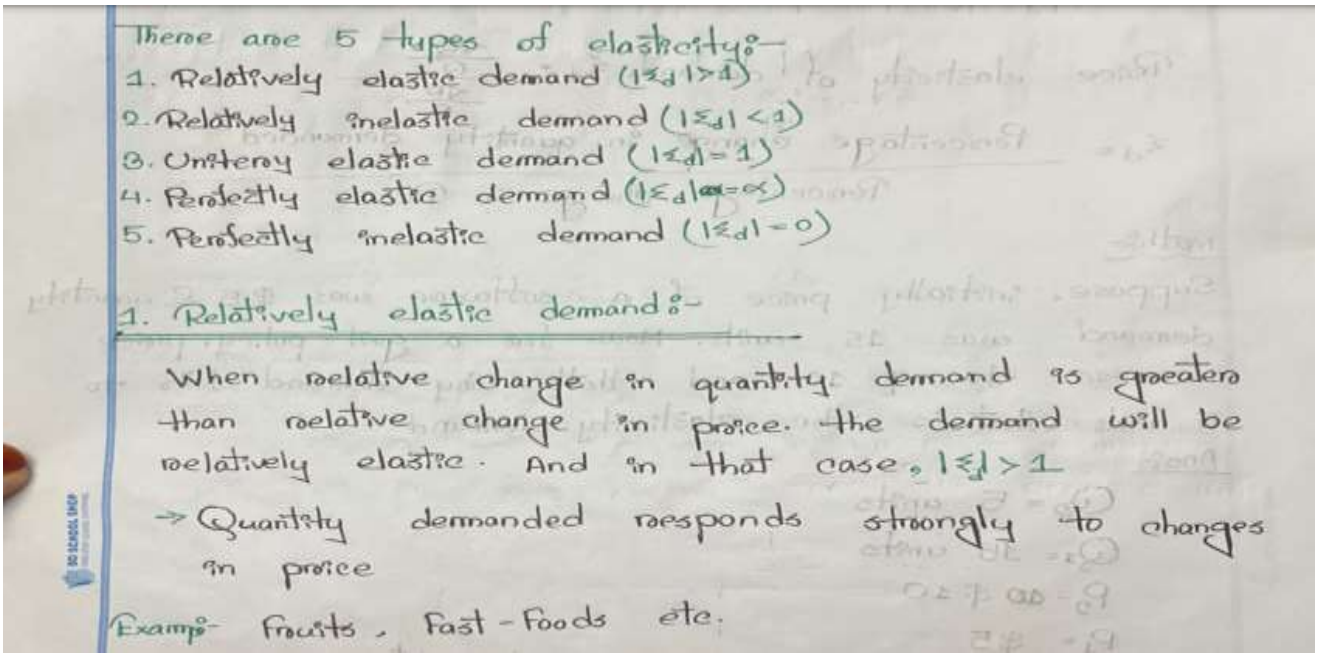
Theory

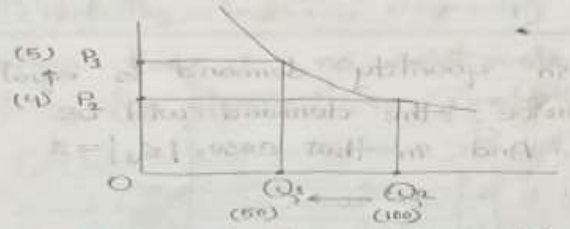
1.Define Elasticity of Demand. Discuss about the classification of the Elastity of Demand?

=>Elasticity is a measure of the responsiveness of quantity demanded or quantity supplied to one of its determinants. Price elasticity of demand is a measure of how much the quantity demanded of a good responds to a change in the price of that good.

Economists compute the price elasticity of demand as the percentage change in the quantity demanded divided by the percentage change in the price. That is,

$$\text{Price elasticity of demand} = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}.$$



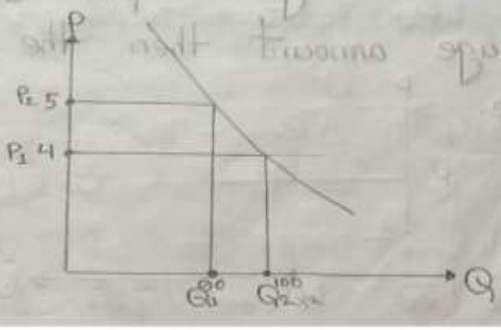


2. Relatively inelastic demand:-

When relative change in quantity demand is lower than relative change in price. the demand will be relatively inelastic. And in that case. $|\varepsilon_d| < 1$

→ Quantity demanded does not respond strongly to price changes.

Example any goods



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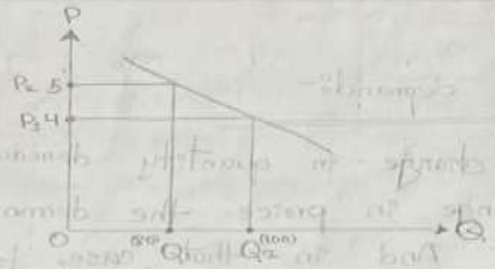
③ Unitary elastic demand:-

When relative change in quantity demand is equal to relative change in price, the demand will be unitary elastic demand. And in that case. $|\varepsilon_d| = 1$



④ Perfectly elastic demand:-

When ~~relative~~ change in ~~quantity~~ ~~demand~~ When for a small change in price. If demand change by a huge amount then the demand will be perfectly elastic.

$|\varepsilon_d| = \infty$

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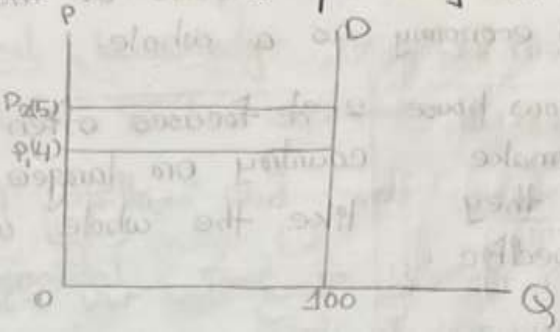
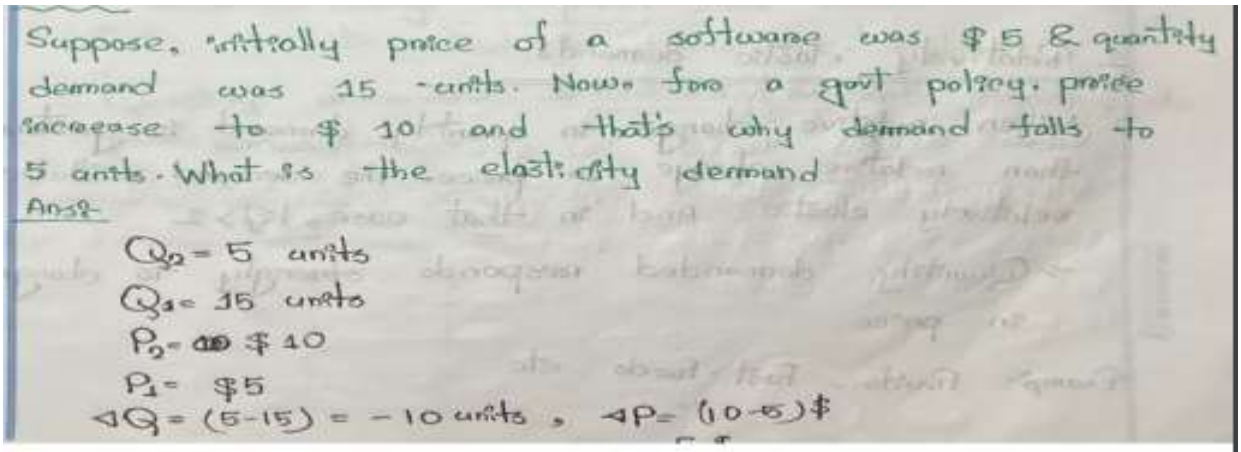
⑤ Perfectly inelastic demand:-

When there is no relationship between price and demand then the demand is perfectly inelastic. ($|\varepsilon_d| = 0$)



Math


Suppose, initially price of a software was $5 & quantity demand was 15 units. Now, for a govt policy, price increase to $10 and that's why demand falls to 5 units. What is the elasticity demand

Ans:-

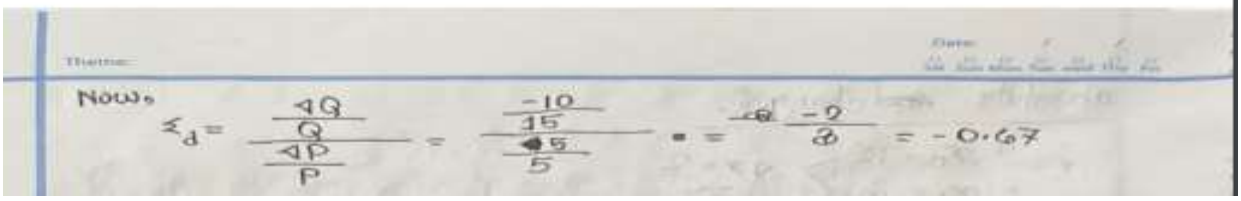
$Q_2 = 5$ units

$Q_1 = 15$ units

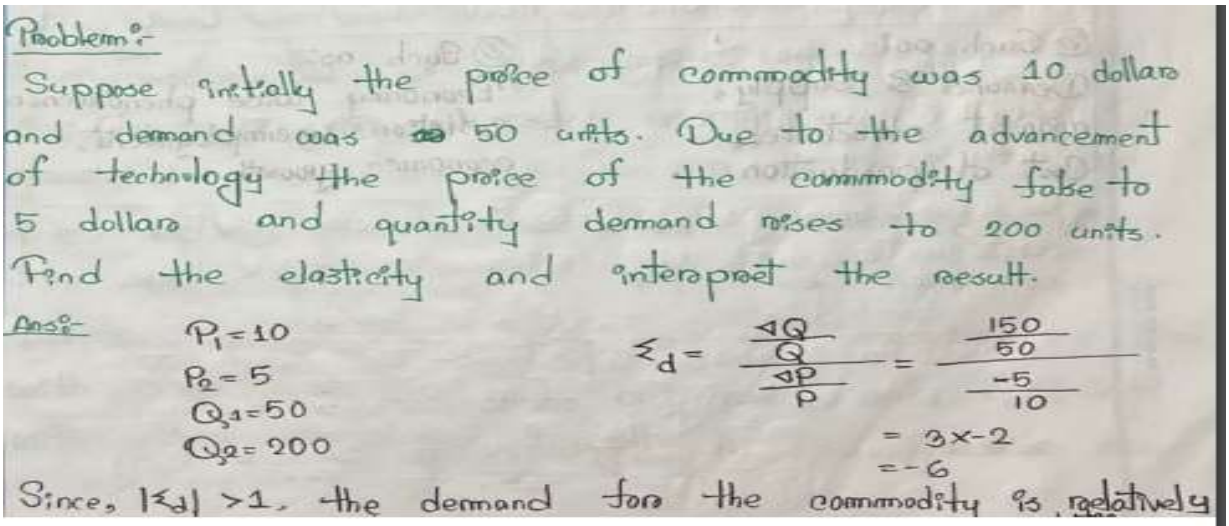
$P_2 = \$10$

$P_1 = \$5$

$\Delta Q = (5-15) = -10$ units, $\Delta P = (10-5)\$$


Now,

$$\varepsilon_d = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}} = \frac{\frac{-10}{15}}{\frac{5}{5}} = \frac{-2}{3} = -0.67$$


Problem:-

Suppose initially the price of commodity was 10 dollars and demand was 50 units. Due to the advancement of technology the price of the commodity fall to 5 dollars and quantity demand rises to 200 units. Find the elasticity and interpret the result.

Ans:-

$P_1 = 10$

$P_2 = 5$

$Q_1 = 50$

$Q_2 = 200$

$$\varepsilon_d = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}} = \frac{\frac{150}{50}}{\frac{-5}{10}}$$

$= 3 \times -2$

$= -6$

Since, $|\varepsilon_d| > 1$, the demand for the commodity is relatively

GDP

Theory

1. Define GDP.

=>GDP stands for Gross Domestic Product. It is a key economic indicator that measures the total monetary value of all final goods and services produced within a country's borders over a specific period, typically a year or a quarter. GDP is used to gauge the size and health of a nation's economy.

2. Distinguish between GDP and GNP.

=>

Definition:

GDP (Gross Domestic Product): Measures the total value of all final goods and services produced within a country's borders during a specific period, regardless of who owns the productive assets.

GNP (Gross National Product): Measures the total value of all final goods and services produced by a country's residents and businesses during a specific period, regardless of where the production takes place.

Geographical Scope:

GDP: Focuses on domestic production within the physical boundaries of the country.

GNP: Includes the production by the country's nationals both inside and outside the country, but excludes production by foreign nationals within the country.

Formula:

GDP = C + I + G + (X - M)

C: Consumption

I: Investment

G: Government spending

X–M: Net exports (exports minus imports)

GNP = GDP + Net Income from Abroad

Net Income from Abroad = Income earned by nationals abroad (e.g., remittances, dividends) - Income earned by foreigners within the country.

Example:

A car manufactured by a Japanese company in the U.S. contributes to U.S. GDP but not to U.S. GNP.

Profits earned by an American company operating in Germany contribute to U.S. GNP but not to U.S. GDP.

3. Briefly explain different components of GDP.

=>We know that

$$GDP = C + I + G + (X - M)$$

This formula provides a comprehensive view of a country's economic activity, highlighting contributions from households, businesses, government, and international trade.

1. Consumption (C): It represents spending by households on goods and services. It includes durable goods (e.g., cars, appliances), nondurable goods (e.g., food, clothing), and services (e.g., healthcare, education). Typically, the largest component of GDP in most economies is consumption.

2. Investment (I): It refers to spending on assets intended to produce future benefits. It Includes:

Business investment: Spending on machinery, tools, and buildings.

Residential investment: Construction of new homes.

Inventory changes: Goods produced but not yet sold.

3. Government Spending (G): It represents government expenditures on goods and services. It includes spending on infrastructure, defense, public services, and salaries of government employees. It excludes transfer payments like pensions or unemployment benefits, as these do not correspond to production.

4. Net Exports (X - M):

Exports (X): Goods and services sold to foreign countries.

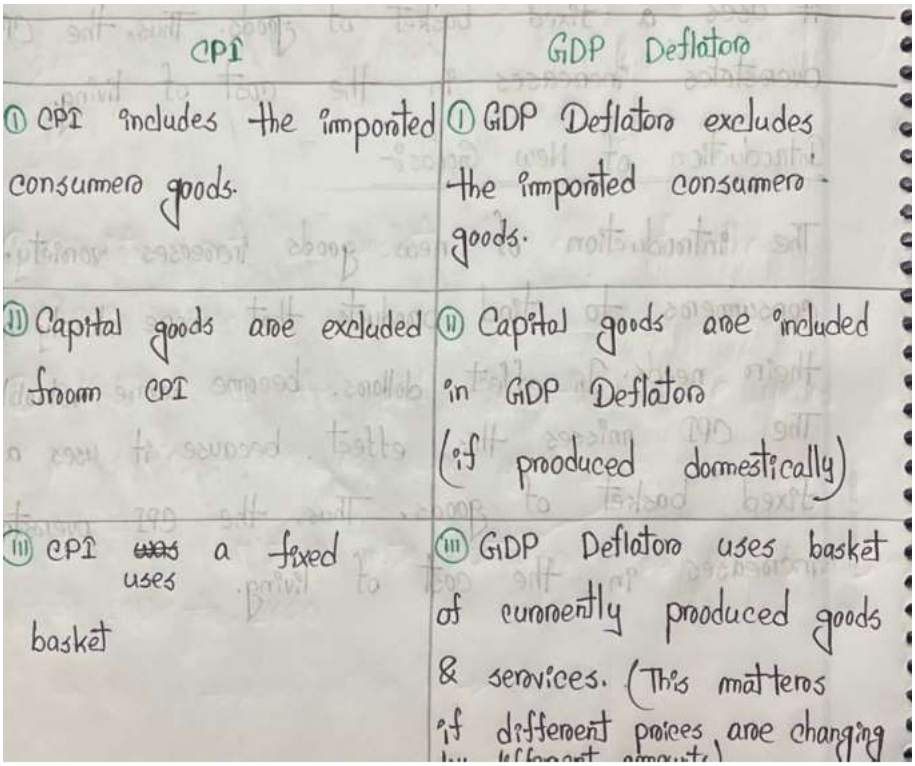
Imports (M): Goods and services purchased from abroad.

Net Exports = Exports - Imports.

A positive value (trade surplus) adds to GDP, while a negative value (trade deficit) subtracts from it.

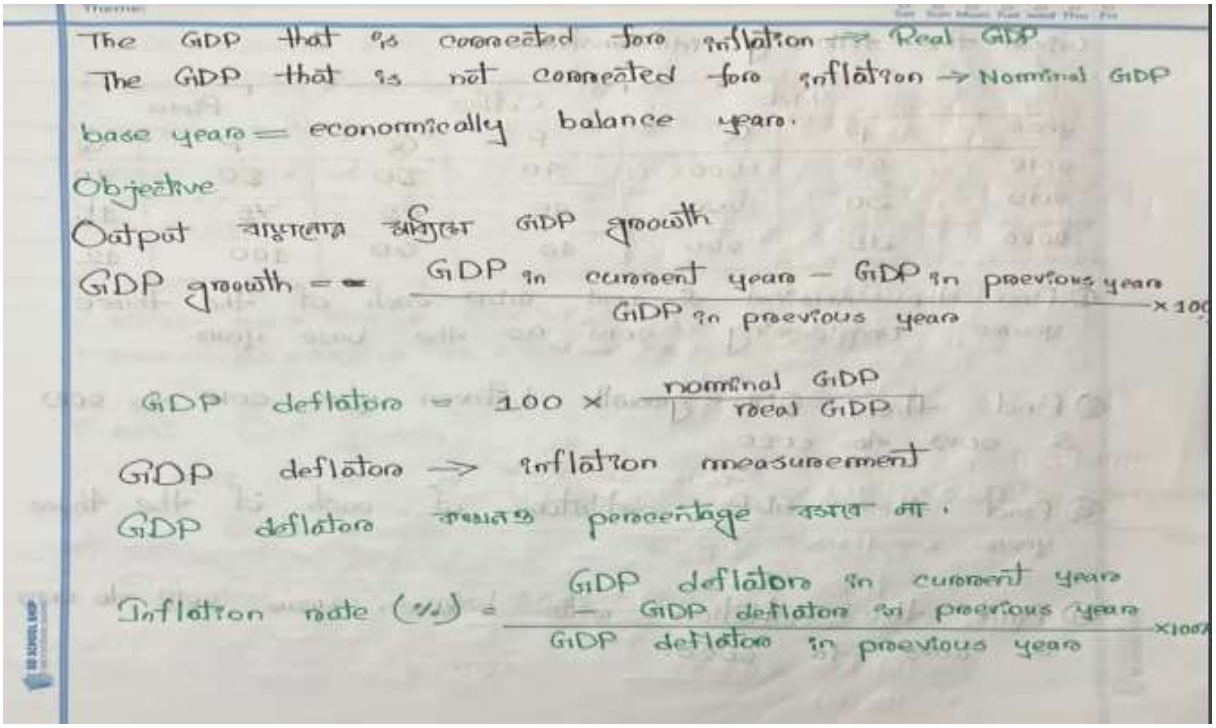
4.State the Differences of CPI & GDP Deflator.

=>



CPI	GDP Deflator
(i) CPI includes the imported consumer goods.	(i) GDP Deflator excludes the imported consumer goods.
(ii) Capital goods are excluded from CPI	(ii) Capital goods are included in GDP Deflator (if produced domestically)
(iii) CPI ~~uses~~ uses a fixed basket	(iii) GDP Deflator uses basket of currently produced goods & services. (This matters if different prices are changing

Math



The GDP that is corrected for inflation → Real GDP
The GDP that is not corrected for inflation → Nominal GDP

base year = economically balance years.

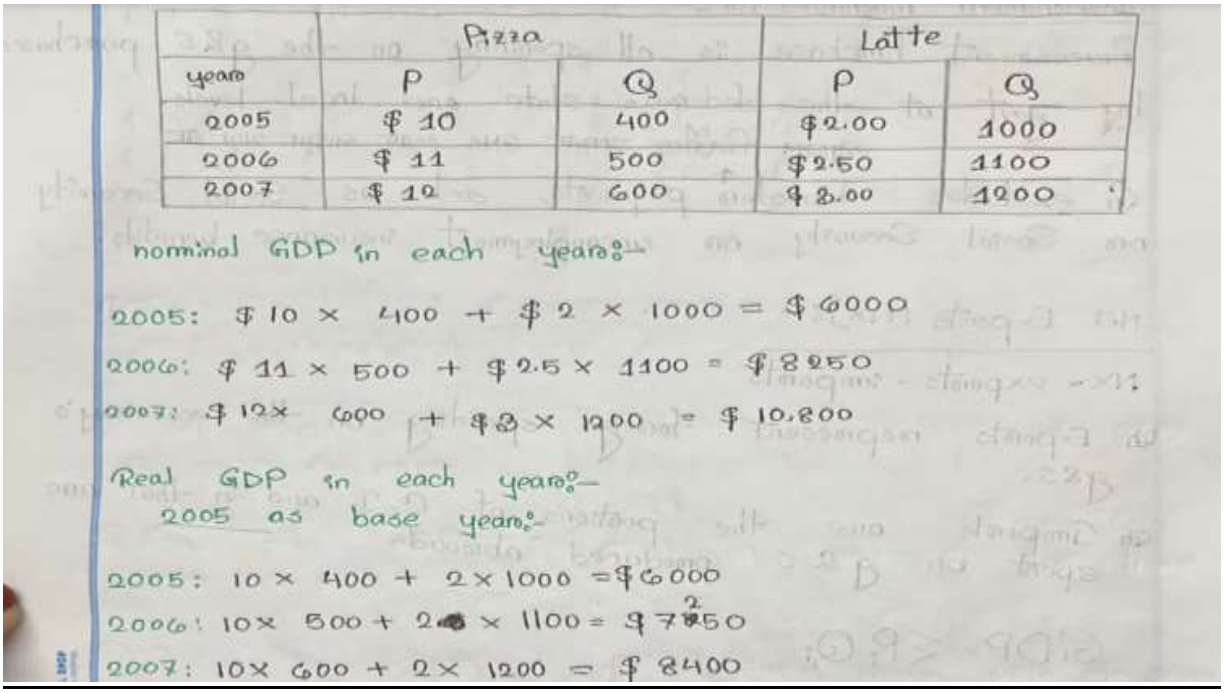
Objective
Output বাড়ানো এবং GDP growth

$$\text{GDP growth} = \frac{\text{GDP in current year} - \text{GDP in previous year}}{\text{GDP in previous year}} \times 100$$

$$\text{GDP deflator} = 100 \times \frac{\text{nominal GDP}}{\text{real GDP}}$$

GDP deflator → inflation measurement
GDP deflator কে সবসময় percentage করে লিখ।

$$\text{Inflation rate (\%)} = \frac{\text{GDP deflator in current years} - \text{GDP deflator in previous years}}{\text{GDP deflator in previous years}} \times 100$$



	Pizza		Latte	
years	P	Q	P	Q
2005	$ 10	400	$2.00	1000
2006	$ 11	500	$2.50	1100
2007	$ 12	600	$ 3.00	1200

nominal GDP in each years:-

2005: $ 10 × 400 + $ 2 × 1000 = $ 6000
2006: $ 11 × 500 + $ 2.5 × 1100 = $ 8250
2007: $ 12 × 600 + $ 3 × 1200 = $ 10,800

Real GDP in each years:-
2005 as base years:-

2005: 10 × 400 + 2 × 1000 = $ 6000
2006: 10 × 500 + 2 × 1100 = $ 7250
2007: 10 × 600 + 2 × 1200 = $ 8400

	Nominal GDP	Real GDP	GDP Deflator	Inflation rate (%)
2005 =	6000/-	6000/-	100.0	
2006 =	8250/-	7200/-	114.6	14.6%
2007 =	10,800/-	8400/-	128.6	12.2%

Given the following information

	Rice		Coffee		Pizza	
years	P	Q	P	Q	P	Q
2018	20	200	10	50	50	10
2019	30	250	15	55	75	15
2020	35	260	13	60	100	12

① Find the nominal & real GDP each of the three years considering 2019 as the base year.

② Find the GDP growth between year 2018 to 2019 & 2019 to 2020

③ Find the GDP deflator of each of the three years.

④ Find the inflation rate between year 2018 to 2019 & 2019 to 2020.

①Ans:- Nominal GDP

2018:- $20 \times 200 + 10 \times 50 + 50 \times 10 = 5000$

2019:- $30 \times 250 + 15 \times 55 + 75 \times 15 = 9450$

2020:- $35 \times 260 + 13 \times 60 + 100 \times 12 = 11080$

Real GDP

2018:- $20 \times 200 + 15 \times 50 + 75 \times 10 = 7500$

2019:- $30 \times 250 + 15 \times 55 + 75 \times 15 = 9450$

2020 = $30 \times 260 + 15 \times 60 + 75 \times 12 = 9600$

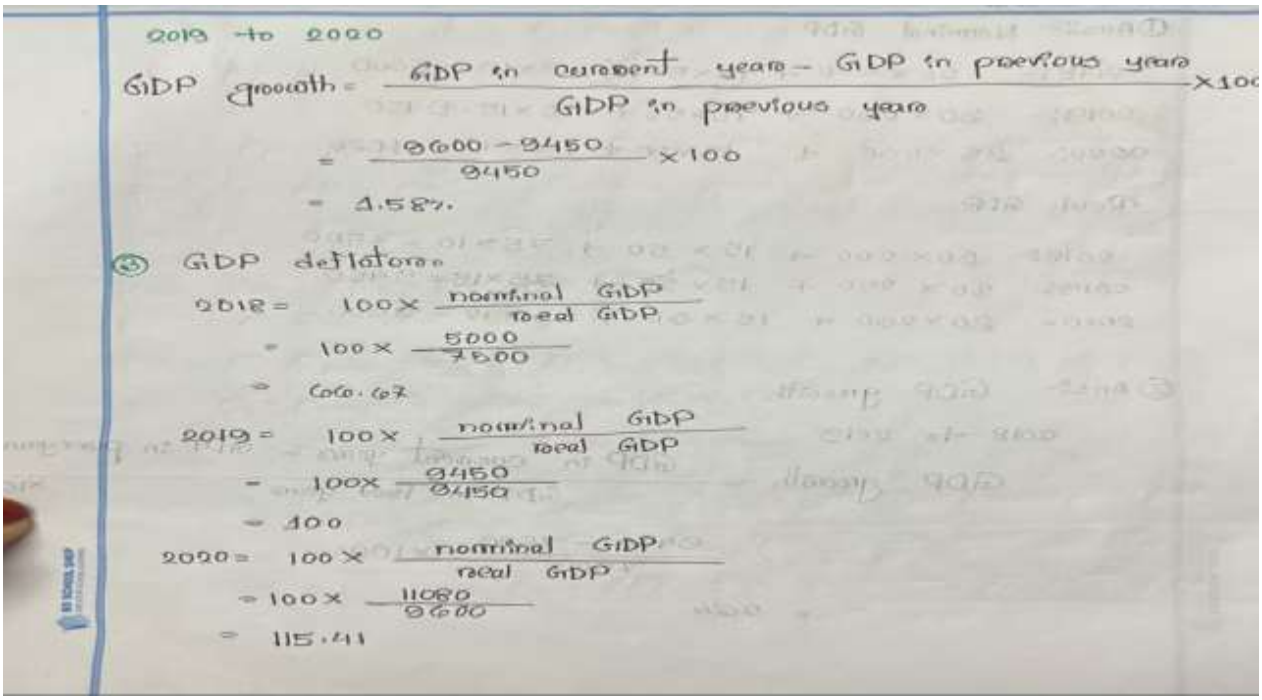
②Ans:- GDP growth

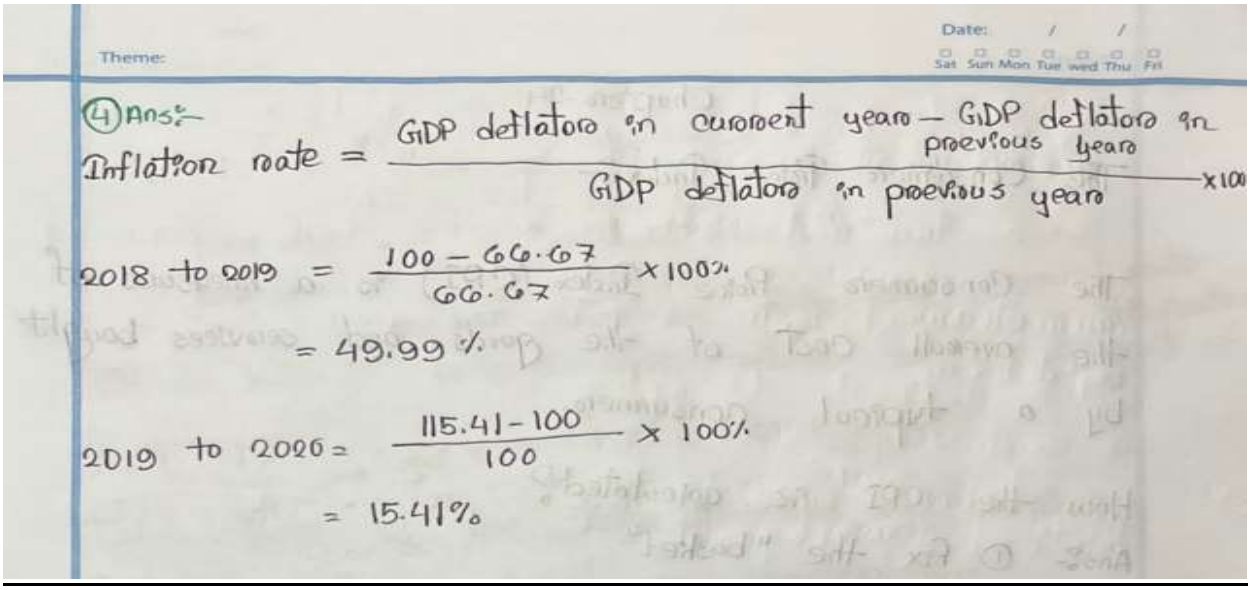
2018 to 2019

$$\text{GDP growth} = \frac{\text{GDP in current years} - \text{GDP in prev years}}{\text{GDP in Prev years}} \times 100$$

$$= \frac{9450 - 7500}{7500} \times 100\%$$

$$= 26\%$$





Unemployment

Theory

1. Briefly explain different types of unemployment with examples.

Unemployment refers to the condition where individuals who are willing and able to work cannot find a job. Different types of unemployment arise due to various economic conditions and factors:

Frictional Unemployment

Definition: Temporary unemployment occurs when people are transitioning between jobs or entering the workforce for the first time.

Example: A recent college graduate looking for their first job or a software engineer switching companies.

Structural Unemployment

Definition: Unemployment caused by a mismatch between workers' skills and job requirements or due to technological advancements, changes in industry, or geographic location.

Example: Factory workers losing jobs because of automation or coal miners becoming unemployed as industries shift to renewable energy.

Cyclical Unemployment

Definition: Unemployment caused by economic downturns or recessions when demand for goods and services decreases, leading to job cuts.

Example: A construction worker losing their job during a recession when housing demand falls.

Natural Rate of Unemployment

The natural rate of unemployment refers to the level of unemployment that exists in an economy when it is operating at its full potential, meaning there is no cyclical unemployment. It represents the long-term, steady-state rate of unemployment due to structural and frictional factors in the labor market.

Math

unemployment rate = $\frac{\text{\# of unemployment}}{\text{labor force}} \times 100$

unemployment rate is not the percentage of the population.

Labour force participation rate = $\frac{\text{labor force}}{\text{adult population}} \times 100$

Labour force participation rate is also not the percentage of the whole population.

Labour force = Total employed + Total unemployed

Adult population = labor force + not in labour force.

Unemployment

- N-R of unemployment
- Cyclical Unemployment

Cyclical unemployment:- is the deviation of unemployment from its natural rate.

C-U = (Actual Unemployment rate - N-R of unemployment)

N-R of Unemployment = (S-U rate + F.U rate)

↳ Structural Unemployment - (Technological invention. fewer jobs)

↳ Frictional Unemployment - (Switching / Waiting for job)

Frictional Unemployment:

It is an unemployment that results because it takes time for workers to search for the jobs that best suit their tastes & skills. (Short term)

$$F\text{-}U \text{ rate} = \frac{\text{frictional Unemployment}}{\text{Labor force}} \times 100\%$$

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Structural Unemployment:-

It is an unemployment that results because the numbers of jobs available in some labor markets is insufficient to provide a job for everyone who wants one. (Long term)

$$S\text{-}U = \frac{\text{structural unemployed}}{\text{Labor force}} \times 100\%$$

Q.1

Adult population = 16 million

No. of unemployed = 4.5 million

No. of employed = 7.5 million

" " frictional unemployed = 2 million

" " structural " = 2 million

(a) Find the Labor force participation rate.

(b) Unemployment rate.

(c) Employment rate

(d) N-U rate

(e) Cyclical unemployment rate.

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Ans:

(a) Labor force = (4.5 + 7.5) million

= 12 million

∴ Labor force participation rate = $\frac{12}{16} \times 100$

= 75%.

(b) U-rate = $\frac{4.5}{12} \times 100$

= 37.5 %

(c) E-rate = $\frac{7.5}{12} \times 100$

= 62.5 %

(d) Frictional unemployment = $\frac{2}{12} \times 100\%$

= 16.67%.

Structural unemployment = $\frac{2}{12} \times 100\%$

= 16.67%.

Natural unemployment rate, N.U. = (16.67 + 16.67)%

= 33.34%.

(e) Cyclical unemployment rate = U-rate − N.U rate

= (37.5 − 33.34)%.

= 4.16%.

Adult population 6 million
No of unemployed 4.5 lac
No of Employed 7.5 million
Fractional unemployed 2 lac
Structural 2 lac

(i) Find the labore force participation rate
(ii) unemployment rate
(iii) employment rate
(iv) natural unemployment rate

(i) labore force = 4.5 lac + 7.5 million
= 4 + 7.95 million

labore force participation rate = $\frac{7.95}{(6+}$ × 100
= 79.5%

(ii) unemployment rate = $\frac{450000}{7950000}$ × 100
= 5.66%

(iii) employment rate = $\frac{7500000}{7950000}$ × 100
= 94.34%

(iv) Frictional unemployment Rate = $\frac{200000}{7950000}$ × 100
= 2.52%

Structural unemployment rate = $\frac{200000}{7950000}$ × 100
= 2.52%

Natural unemployment rate = (2.52 + 2.52)%
= 5.04%

(v) Cyclical unemployment rate = (5.66 - 5.04)%
= 0.62%

Production & Cost

Theory

1.Distinguish between average cost and marginal cost

=>

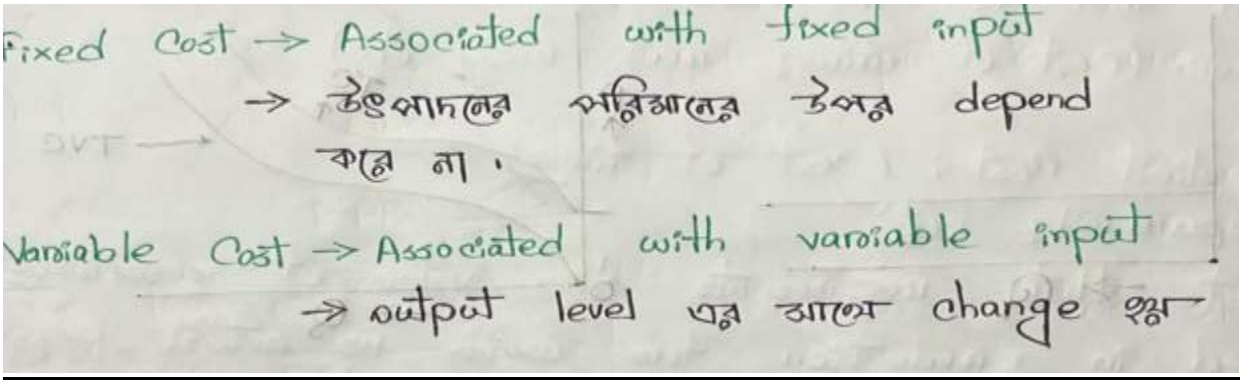
Aspect	Average Cost (AC)	Marginal Cost (MC)
Definition	AC is the total cost per unit of output.	MC is the additional cost incurred to produce one more unit of output.
Formula	AC =	AC =
Nature	Includes both fixed and variable costs, averaged over all units produced.	Reflects changes in variable costs as output changes.
Behavior	AC initially decreases due to spreading fixed costs, then may increase due to rising variable costs.	MC initially decreases due to efficiencies, then increases due to diminishing returns.
Graphical Representation	AC curve is U-shaped, reflecting economies and diseconomies of scale.	MC curve is also U-shaped and intersects the AC curve at its lowest point.
Relationship	When MC < AC, AC decreases; when MC > AC, AC increases; when MC = AC, AC is at its minimum.	MC influences the behavior of AC at different output levels.
Example	If total cost is $1,000 for 100 units, AC = $10 per unit.	If the total cost increases from $1,000 to $1,050 when output rises from 100 to 101 units, MC = $50.

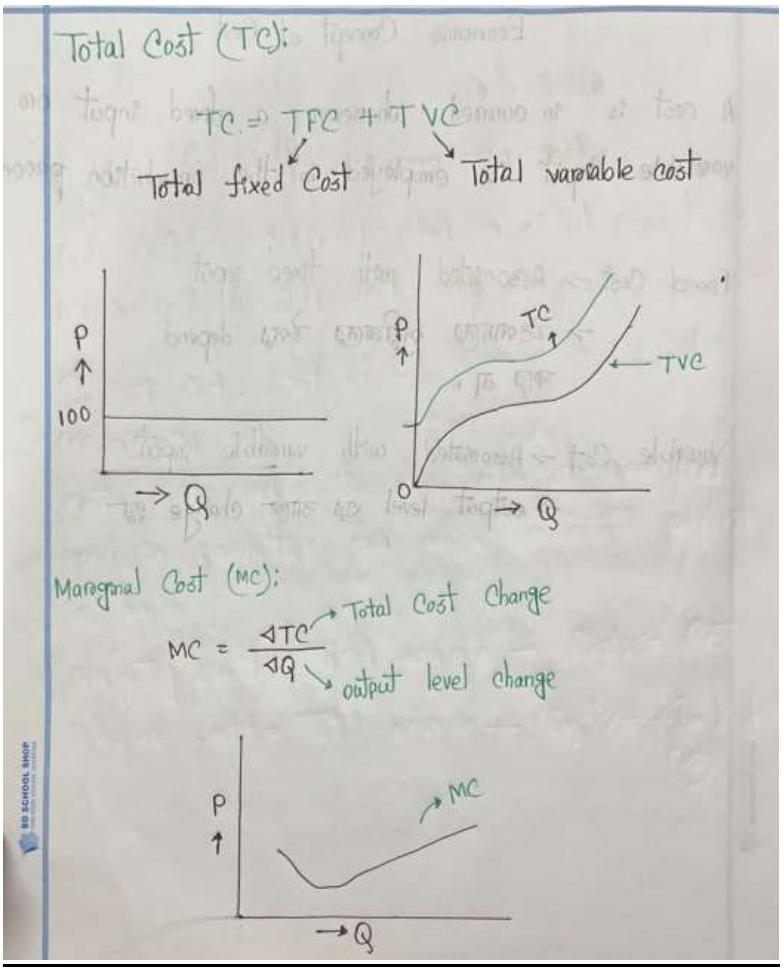
2. Distinguish between fixed cost and variable cost.

=>

Aspect	Fixed Cost (FC)	Variable Cost (VC)
Definition	Costs that do not change with the level of output produced.	Costs that vary directly with the level of output produced.
Dependence on Output	Independent of the quantity of goods or services produced.	Directly proportional to the quantity of goods or services produced.
Calculation	Total Fixed Cost (TFC) remains the same across all output levels.	Total Variable Cost (TVC) = Cost per unit × quantity of output.
Behavior	Remains constant regardless of production level (even if output is zero).	Increases or decreases depending on the level of output.
Graphical Representation	Appears as a horizontal line when plotted against output.	Appears as an upward-sloping line starting from the origin.
Example	Rent, salaries of permanent staff, insurance, depreciation on machinery.	Raw materials, electricity for production, wages of temporary workers.

Math

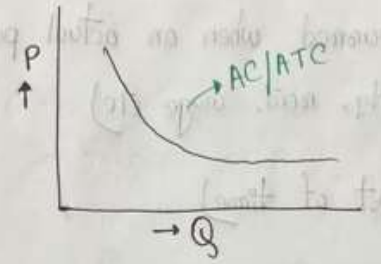

Fixed Cost → Associated with fixed input
→ উৎপাদনের পরিমানের উপর depend করে না।
Variable Cost → Associated with variable input
→ output level এর আলে change হয়


Total Cost (TC):
TC = TFC + TVC
Total fixed Cost
Total variable cost
P
100
Q
P
TC
TVC
O
Q
Maregnal Cost (MC):
MC = ΔTC / ΔQ
Total Cost Change
output level change
P
MC
Q

Average Total Cost (AC):

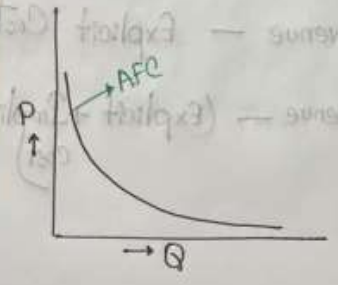
ATC / AC = $\frac{TC}{Q}$ → Total Cost

Q → Output level



Average Fixed Cost (AFC):

$AFC = \frac{TFC}{Q}$



Average Variable Cost (AVC):

$AVC = \frac{TVC}{Q}$