# Percentage Notes (For Placements & Quick Understanding)

## 1. Basics of Percentage

Formula:  
Percentage = (Value / Total Value) × 100

A percentage is a fraction where the denominator is always 100.

Example: A shopkeeper gives a 25% discount on a ₹200 item. Find the discounted price.

Solution:  
1. Discount = (25/100) × 200 = ₹50  
2. New Price = ₹200 - ₹50 = ₹150

## 2. Percentage Increase/Decrease

Formula:  
Increase: New Value = Old Value × (1 + a/100)  
Decrease: New Value = Old Value × (1 - a/100)

Example: If the price of a commodity rises by 15%, how much should consumption decrease to keep expenditure the same?

Solution:  
1. Let original expenditure be `E` and price per unit be `P`.  
2. New price per unit = `P × 1.15`.  
3. To maintain expenditure, new quantity = `E / (P × 1.15)`.  
4. Percentage decrease in quantity = (15 / 115) × 100 = 13.04% decrease.

## 3. Population Formula

Formula:  
Future Population (after n years): P = P₀ × (1 + r/100)ⁿ  
Past Population (before n years): P = P₀ × (1 - r/100)ⁿ

Example: A city's population is 8,000 and grows by 8% annually. Find the population after 3 years.

Solution:  
1. Given: Initial population = 8000, Growth rate = 8%, Time = 3 years.  
2. Population after 3 years = 8000 × (1.08)^3.  
3. ≈ 10,078 people.

## 4. Successive Percentage Change

Formula:  
Net Change = x + y + (xy / 100)

Example: If a value first increases by 12% and then decreases by 8%, find the net percentage change.

Solution:  
1. Applying formula: 12 - 8 + (12 × -8)/100.  
2. = 3.04% increase.

## 5. Comparing Salaries & Incomes

Formula:  
If A’s income is x% more than B’s, then B’s income is (x / (100 + x)) × 100% less than A’s.

Example: A’s income is 20% more than B’s. Find how much % B’s income is less than A’s.

Solution:  
1. Using formula: (20/120) × 100.  
2. = 16.67% less.

## 6. Exam Marks Calculation

Formula:  
Total Marks = (Obtained Marks + Failed Marks) × 100 / Passing Percentage

Example: A student scores 150 marks and fails by 30 marks when the pass percentage is 40%. Find total marks.

Solution:  
1. Using formula: (150 + 30) × 100 / 40.  
2. = 450 marks.