

CHAPTER 08**Comparing Quantities****Compound Interest:**

Interest calculated on the principal and the accumulated interest of the previous periods of interest is called 'Compound Interest'.

The amount obtained by adding simple interest to the principal, at the end of the first period is taken as the principal for the second period. The amount at the end of second period is taken as the principal for the third period and so on.

Hence, the amount is said to be compounded. The difference of the final amount thus obtained and the actual principal gives the compound interest.

$$\text{Compound Interest (C. I)} = \text{Amount (A)} - \text{Principal (P)}$$

Note:

- Simple interest and compound interest for the first year are the same.

- The difference between the amounts for successive years is nothing but the simple interest on the amount accumulated for one year at the given rate of interest.

The formula to calculate compound interest:

$$A = P \left(1 + \frac{R}{100} \right)^n$$



$$\text{Compound Interest (C. I)} = \text{Amount (A)} - \text{Principal (P)}$$

where, A = Amount at the end

P = Principal

R = Rate of Interest

n = No of compounding periods

C. I = Compound Interest

A = Amount at the end

P = Principal

Note:

Compound interest is usually calculated per year. But it may also be calculated daily, monthly, quarterly, half-yearly and so on.

Example:

Find the amount of Rs.16000 for 3 years, compounded annually at 5% per annum. Also, find the compound interest.

Sol.


Given that,

$$P = \text{Rs. } 16000$$

$$R = 5\% \text{ per annum}$$

$$n = 3 \text{ years}$$

Using formula $(A) = P \left(1 + \frac{R}{100} \right)^n$



$$\begin{aligned}
 &= 16000 \left(1 + \frac{5}{100} \right)^3 \\
 &= 16000 \left(\frac{21}{20} \right)^3 \\
 &= 16000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20}
 \end{aligned}$$

Amount after three years = Rs. 18,522

Compound Interest = Amount – Principal

$$= \text{Rs. } 18522 - \text{Rs. } 16000$$

Hence,

Compound Interest (C. I) = Rs. 2,522

