Chapter- 9

Interest:

(i) Simple interest: When interest is calculated on the original principal for any length of time, it is called simple interest.

- **Simple interest =** (Principal×Time×Rate)/100. i.e. S.I. = (P×R×T)/100.
- Amount = Principal + **Interest**. ...
- Principal (P) = (100×S.I.)/(R×T)
- Rate(R) = (100×S.I.)/(T×P)
- Time (T) = (100×S.I.)/(P×R)

Compound Interest:

1. Let Principal = P, Rate = R% per annum, Time = n years.
2. **When interest is compound Annually:**

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

3. **When interest is compounded Half-yearly:**

$$\text{Amount} = P\left[1+\frac{(R/2)}{100}\right]^{2n}$$

4. **When interest is compounded Quarterly:**

$$\text{Amount} = P\left[1+\frac{(R/4)}{100}\right]^{4n}$$

5. **When interest is compounded Annually but time is in fraction, say $3\frac{2}{5}$ years.**

$$\text{Amount} = P\left(1+\frac{R}{100}\right)^{3} \times \left(1+\frac{\frac{2}{5}R}{100}\right)$$

6. **When Rates are different for different years, say $R_1\%$, $R_2\%$, $R_3\%$ for 1^{st}, 2^{nd} and 3^{rd} year respectively.**

$$\text{Then, Amount} = P\left(1+\frac{R_1}{100}\right)\left(1+\frac{R_2}{100}\right)\left(1+\frac{R_3}{100}\right).$$

7. **Present worth of Rs. x due n years hence is given by:**

$$\text{Present Worth} = \frac{x}{\left(1+\frac{R}{100}\right)^{n}}.$$