Simple Interest

- **Simple interest** is nothing but the fixed percentage of the principal (invested/borrowed/ amount of money).
- **Principal (P):** It is the sum of money deposited/ loaned etc. also known as “Capital”.
- **Interest:** It is the money paid by the borrower, calculated on the basis of Principal.
- **Time (T/n):** This is the duration for which money is borrowed.
- **Rate of Interest (r/R):** It is the rate at which the interest is charged on principal.
- **Amount (A)** = Principal + Interest

Some Basic Formulae :

Simple Interest (SI):

P = Principal,

r = rate of interest (in %)

t = time period (yearly, half yearly etc.)

$$\textbf{Amount (A)} = \text{P} + \text{SI} = \text{P} + \frac{prt}{100} = P\left(1 + \frac{rt}{100}\right)$$

Some Useful Short-cut Methods:

1. If a certain sum is invested in n types of investments in such a manner that equal amount is obtained on each investment where interest rates are R_1R_2 R_3 …..Rn respectively and time periods are T_1 T_2 T_3….. Tn respectively, then the ratio in which the amounts are invested is :

$$\frac{1}{100+R_1T_1} : \frac{1}{100+R_2T_2} : \frac{1}{100+R_3T_3} : \ldots\ldots \frac{1}{100+R_nT_n}$$

Effect of change of P, R and T on simple interest is given by the following formulae:

$$= \frac{Product\ of\ fixed\ parameters}{100} \times [\text{difference of product of variable parameters}]$$

For example, if rate (R) changes from R_1 to R_2 an P and T are fixed, then

Change in S. I. $= \frac{PT}{100} \times (R_1 - R_2)$

Similarly, if principal (P) changes from P_1 to P_2 and R and T are fixed, then change in

S.I $= \frac{RT}{100} \times (P_1 - P_2)$

Also, if rate (R) changes from R_1 to R_2 and time (T) changes from T_1 to T_2 but principal (P) is fixed, then change in

S.I. $= \frac{P}{100} \times (R_1T_1 - R_2T_2)$

6. If a certain sum of money P lent out at S.I. amounts to A_1 in T_1 years and to A_2 in T_2 years, then

$$P = \frac{A_1T_2 - A_2T_1}{T_2 - T_1}$$

$$R = \frac{A_1 - A_2}{A_1T_2 - A_2T_1} \times 100\%$$