

# CHAPTER EIGHT

## SIMPLE INTEREST

- Money borrowed from or deposited at institutions such as a bank, is referred to as the principal.
- When we are returning this borrowed amount, we have to pay a price and this price paid is known as the interest or simple interest.
- Apart from that when we deposit an amount at a bank; the bank adds interest to it from time to time.
- It is also a common practice that when we take a loan from an individual or a group, we return it with an interest.

$$S.I = \frac{P \times R \times T}{100}, \text{ where } S.I = \text{simple interest.}$$

$P$  = the Principal.

$T$  = the time in years.

$R$  = the rate.

Q1. Find the simple interest on ₦700, for 5 years at a rate of 3% per annum.

Soln.

$P = ₦700$ ,  $R = 3\%$ ,  $T = 5$  years.

$$S.I = \frac{P \times R \times T}{100} = \frac{700 \times 3 \times 5}{100} = 105. \text{ The simple interest} = ₦105$$

Q2. Find the simple interest on ₦500 at 10% per annum for 2 years.

Soln.

$P = ₦500$ ,  $R = 10\%$ ,  $T = 2$  years.

$$S.I = \frac{P \times R \times T}{100} = \frac{500 \times 10 \times 2}{100} = ₦100.$$

Q3. A man borrowed ₦2000 from a bank for 10 years, at an interest rate of 5% per annum. Calculate

- the interest he paid on this loan.
- the amount he returned to the bank.

N/B: Per annum which means every year can also be written as p.a

Soln.

i.  $P = \text{¢}2000, T = 10\text{years}, R = 5\%$

$$S.I = \frac{P \times R \times T}{100} = \frac{2000 \times 5 \times 10}{100} = \text{¢}1000.$$

ii. The amount he paid to the bank = the principal + the interest =  $\text{¢}2000 + \text{¢}1000 = \text{¢}3,000$ .

Q4. Mr. John wishes to take a loan of  $\text{¢}400$  from a bank, for 8 years at an interest rate of 2% p.a. Determine the amount of money, which he will be required to pay back to the bank.

Soln.

$P = \text{¢}400, T = 8\text{yrs } R = 2\%$

$$S.I = \frac{P \times R \times T}{100} = \frac{400 \times 2 \times 8}{100} = 64. \text{The interest} = \text{¢}64.$$

Amount needed to be paid to the bank =  $400 + 64 = \text{¢}464$ .

Q5. Determine the interest on  $\text{¢}600$  for 4 years at a rate of  $2\frac{1}{2}\%$  per annum.

Soln.

$P = \text{¢}600, T = 4 \text{ years}, R = 2\frac{1}{2}\% = \frac{5}{2}\%$

$$S.I = \frac{P \times R \times T}{100} = \frac{600 \times \frac{5}{2} \times 4}{100} = \frac{600 \times 5 \times 4}{2 \times 100} = \frac{600 \times 5 \times 4}{200} = \text{¢}60.$$

Q6. Find the simple interest on a loan of  $\text{¢}9000$ , taken from a financial institution by Mr. Kwame, at a rate of  $3\frac{1}{3}\%$  per annum, if he was able to repay the loan in five years time.

$P = \text{¢}9000, T = 5\text{years}, R = 3\frac{1}{3}\% = \frac{10}{3}\%$

$$S.I = \frac{P \times R \times T}{100} = \frac{9000 \times \frac{10}{3} \times 5}{100} = \frac{9000 \times 10 \times 5}{3 \times 100} = \frac{9000 \times 10 \times 5}{300} = \text{¢}1500$$

Q7. Find the simple interest on  $\text{¢}400$  for 6 months at a rate of 10% per annum.

N/B: The time given in months must be changed into years by dividing by 12.

Soln.

$P = \text{¢}400, R = 10\%, T = 6 \text{ months} = \frac{6}{12} = \frac{1}{2} \text{ year}$

$$S.I = \frac{P \times R \times T}{100} = \frac{400 \times 10 \times \frac{1}{2}}{100} = \frac{400 \times 10 \times 1}{2 \times 100} = \frac{400 \times 10}{200} = \text{¢}20$$

Q8. A man deposited ₦4,500 at a bank for 3 months at rate 60% per annum. Calculate the interest earned at the end of the 3 months period.

Soln.

$$P = ₦4500, R = 60\%, T = 3 \text{ months} = \frac{3}{12} = \frac{1}{4} \text{ year}$$

$$S.I = \frac{P \times R \times T}{100} = \frac{4500 \times 60 \times \frac{1}{4}}{100} = \frac{4500 \times 60 \times 1}{4 \times 100} = \frac{4500 \times 60}{400} = ₦675.$$

Q9. Find the principal which generated an interest of ₦18, for 3 years at a rate 6% per annum.

Soln.

$$P = ?, T = 3 \text{ yrs}, R = 6\%, S.I = ₦18.$$

$$\text{Since } S.I = \frac{P \times R \times T}{100} \Rightarrow 18 = \frac{P \times 6 \times 3}{100}, \Rightarrow 18 = \frac{18P}{100} \Rightarrow 18 \times 100 = 18P, \Rightarrow 1800 = 18P \Rightarrow P = \frac{1800}{18} \Rightarrow P = ₦100.$$

Q10. A certain amount was deposited at a bank, for 10 years at a rate of 4% per annum. If the interest earned was ₦500, determine this amount.

Soln.

$$P = ?, S.I = ₦500, R = 4\% \text{ and } T = 10 \text{ yrs.}$$

$$S.I = \frac{P \times R \times T}{100} \Rightarrow 500 = \frac{P \times 4 \times 10}{100}, \Rightarrow 500 = \frac{40P}{100} \Rightarrow 500 \times 100 = 40P, \Rightarrow 50000 = 40P \Rightarrow P = \frac{50000}{40}, \Rightarrow P = 1250. \text{ The amount} = ₦1,250.$$

Q11. Kofi earned an interest of ₦2000 at a bank, for depositing an amount of money at this bank for 3 months at, at a rate of 20% per annum. Calculate his deposit.

Soln.

$$S.I = ₦2000, P = ? T = 3 \text{ months} = \frac{3}{12} = \frac{1}{4} \text{ yrs}, R = 20\%$$

$$S.I = \frac{P \times R \times T}{100} \Rightarrow 2000 = \frac{P \times 20 \times \frac{1}{4}}{100} \Rightarrow 2000 = \frac{P \times 20}{4 \times 100}, \Rightarrow 2000 = \frac{20P}{400}. \text{ Therefore } 2000 \times 400 = 20P \Rightarrow 800000 = 20P, \Rightarrow P = \frac{800000}{20} = 40000. \text{ The amount deposited} = ₦40,000.$$

Q12. An amount of ₦550 deposited at a bank earned an interest of ₦55. If the rate was 10% p.a, determine the time.

Soln.

S.I = ₦55, P = ₦550, R = 10%, T = ?

$$\text{Since } S.I = \frac{P \times R \times T}{100} \Rightarrow 55 = \frac{550 \times 10 \times T}{100}, \Rightarrow 55 = 55T, \Rightarrow T = \frac{55}{55} = 1 \text{ yr.}$$

Q13. An amount of ₦250 was borrowed from a bank, at an interest rate of 20% per annum, for a certain length of time. Given that the interest paid at the end of this time period was ₦50, find the time.

Soln.

P = ₦250, R = 20%, S.I = ₦50, T = ?

$$S.I = \frac{P \times R \times T}{100} \Rightarrow 50 = \frac{250 \times 20 \times T}{100}, \Rightarrow 50 = 50T, \Rightarrow T = 1 \text{ yr.}$$