CHAPTER TWO

SIMPLE AND COMPOUND INTEREST

Introduction:

*Money deposited or borrowed from a financial institution, such as a bank is referred to as the principal.

*When one borrows from a financial institution and is returning the borrowed amount, he is required to add a certain amount, determined by certain factors such as time and the rate of borrowing to the institution.

*This added amount is known as the interest.

*Also when one makes a deposit at a financial institution, such institutions normally from time to time add certain small amounts to the deposited amount.

*This added amount is also known as interest

Simple interest:

S. I. = $\frac{P \textbf{ X } R \textbf{ X } T}{100}$

Where P = The principal.

R = The rate.

T = Time in years.

N/B: P. a = Per annum.

(Q1) Find the simple interest on ¢700, for 5 years at a rate of 3% per annum

Soln:

P = ¢ 700, R = 3% and T = 5 years.

S.I = P **X** R **X** T**=** 700 **X** 3 **X** 5 **=** ¢105.

100 100

(Q2) A man borrowed ¢2000 from a bank for 10 years, at a rate of 5% per annum. Calculate

(i) the simple interest.

(ii) the amount returned to the bank by the man.

Soln:

(i) P = ¢2000, T = 10 years and R = 5%.
S.I = P **X** R **X** T**=** 2000**X** 5 **X** 10 **=** ¢1000.
100 100

(ii) The amount returned to the bank = The principal **+** the interest **=** ¢2000 **+** ¢1000 **=** ¢3,000.

(Q3) Mr. John took a loan of ¢400 from a bank, for 8 years at a rate of 2% p.a. Determine the amount of money he returned to the bank.

Soln:

S.I = P **X** R **X** T**=** 400 **X** 2 **X** 8 **=** ¢64.

100 100

=>Amount returned to the bank = 400 **+** 64 **=** ¢464.

(Q4) Determine the simple interest on ¢9000 for 5 years at 3⅓ % per annum.

Soln:

P = ¢9000, T = ¢5years and R = 3⅓% = 10/3% = 3.3%.

S.I = P **X** R **X** T **=** 9000 **X** 3.3 **X** 5 **=** ¢1485.

100 100

N/B: If the time is given in months, it must be changed into years by dividing by 12.

(Q5) Find the simple interest on ¢400 for 6 months at a rate of 10% p.a.

Soln:

P = ¢400, T= 6months = 6/12 = 0.5 years and R = 10%.

S.I = P **X** R **X** T= 400 **X** 10 **X** 0.5 = ¢20.

100 100

(Q6) A man deposited an amount of ¢800 at a bank for 4 months at a rate of 3¼% per annum. Find the interest he earned.

Soln:

P = ¢800, T = 4months = 4/12= 0.33 years, R = 3¼= 13/4 = 3.25%.

S.I = P **X** R **X** T= 800 **X** 3.25 **X** 0.33 = ¢858.

100 100

(Q7) Kofi earned ¢200 as interest at a bank for depositing a certain amount at the bank for 3months, at a rate of 20% p.a. Determine his deposit.

Soln:

P = deposit= **?,** T = 3months = 3/12 = 0.25 years, R = 20%.

S.I = P **X** R **X** T= P **X** 0.25 **X** 20

100 100

=>S.I = 5P

100

Since the interest earned = ¢2000 =>2000 = 5P/100

=>2000 **X** 100 = 5P

=>200000 = 5P

P = 200000 = 40,000.

5

Deposit= ¢40,000.

(Q8) A man gained an interest of ¢20, for depositing a certain amount at a bank for 8 months, at an interest rate of 5½% p.a. Find the amount deposited.

Soln:

S.I = ¢20, P = ?, T= 8months = 8/12 = 0.67 years and R= 5½= 11/2% = 5.5%.

Since S.I = P **X** R **X** T

100

=>20 = P **X** 5.5 **X** 0.67,

100

∴ 20 **X** 100 = 3.7p,

=>2000 = 3.7p => P = $\frac{2000}{3.7} = ¢541.$

(Q9) An amount of ¢250 was borrowed from a bank, at an interest rate of 20% per annum, for a certain length of time. If the interest paid at the end of this time period was ¢50. Find the time.

Soln:

P = ¢250, R= 20%, S.I = ¢50, T= ?

But since **S.I** = P **X** R **X** T

100

=>50 = 250 **X** 20 **X** T

100

=>50 **X** 100 **=** 5000T,=>5000 **=** 5000T.

∴ T **=** $\frac{5000}{5000}$**=** 1, => T **=** 1 year.

(Q10) Kofi borrowed an amount of ¢4000, at a rate of 10% per annum from a bank. At the end of this time period, he had to pay an amount of ¢6000 to the bank. Find this time.

Soln:

P **=** ¢4000, R**=** 10% and T =?.

Amount returned to the bank **= ¢**6000.

Interest **=** Amount returned — the principal **=** ¢6000 —¢4000 **=** ¢2000.

Since S.I = P **X** R **X** T

100

=> 2000 **=** 4000 **X** 10 **X** T

100

=>2000 **=** 400T => T **=** $\frac{2000}{400}$, => T **=** 5 years.

(Q11) John borrowed an amount of ¢600 at a rate of 12½% per annum, for a certain length of time. At the end of this time period he had to pay ¢630. Find the time.

Soln:

P **=** ¢600, R **=** 12½% **=** 12.5% and T = ?.

S.I = 630 — 600 **=** ¢30.

Since S.I = P **X** R **X** T

$$\frac{100}{}$$

$$\Rightarrow 30 = \frac{600 \times 12.5 \times T}{100}$$

$$\Rightarrow 30 = \frac{7500T}{100}, \Rightarrow 30 \times 100 = 7500T$$

$$\Rightarrow T = \frac{3000}{7500} = 0.4 \text{ years.}$$