

## CHAPTER 9 – SIMPLE AND COMPOUND INTEREST

### Question 1.

Find the interest and the amount on:

(i) ₹ 750 in 3 years 4 months at 10% per annum.

**Solution:**

Given P = ₹ 750

$$\text{Time (T)} = 3 \frac{4}{12} = 3 \frac{1}{3} = \frac{10}{3} \text{ years}$$

Rate (R)=10%

$$\text{Interest (I)} = \frac{PRT}{100} = \frac{750 \times 10 \times \frac{10}{3}}{100}$$

$$\frac{250 \times 10 \times 10}{100} = 250$$

(ii) ₹ 5000 at 8% per year from 23<sup>rd</sup> December 2011 to 29<sup>th</sup> July 2012.

**Solution:**

Principal (P) = ₹ 5000

Rate (R) = 8% p.a

Time (T) = 23 December 2011 to 29 July 2012

Dec. Jan. Feb. March April May June July

8 31 29 31 30 31 30 29

$$\text{Total 219 days} = \frac{219}{365} \text{ Years}$$

$$\therefore \text{Interest} = \frac{PRT}{100} = \frac{5000 \times 8 \times 219}{100 \times 365}$$

$$= 10 \times 8 \times 3 = 240$$

$$\therefore \text{Amount} = P + I = ₹ 5000 + 240 = ₹ 5240$$

(iii) ₹ 2,600 in 2 years 3 months at 1% per month.

**Solution:**

Here p = ₹ 2600

Time (T) = 2 Years 3 month = 27 months

Rate (R) = 1 per month

$$\therefore \text{Interest} = \frac{P \times T \times R}{100} = \frac{2600 \times 27 \times 1}{100}$$

$$= 26 \times 27 = \text{Rs. } 702$$

$$\therefore \text{Amount} = (2600 + 702) = \text{Rs. } 3302$$

(iv) ₹ 4,000 in  $1\frac{1}{3}$  years at 2 paise per rupee per month.

**Solution:**

Here  $P = \text{Rs. } 4,000$ , Time (T) =  $1\frac{1}{3}$  year

$$= 1 \text{ year} + \frac{12}{3} \text{ months} = 16 \text{ months}$$

Rate (R) = 2 paise per rupee per month = 2% per month

$$\therefore \text{Interest (I)} = \frac{P \times T \times R}{100} = \frac{4,000 \times 2 \times 16}{100} = 40 \times 32 = \text{Rs. } 1280$$

$$\therefore \text{Amount (A)} = P + I = \text{Rs. } 4000 + \text{Rs. } 1280 = \text{Rs. } 5280$$

## Question 2

Rohit borrowed Rs. 24,000 at 7.5 percent per year. How much money will he pay at the end of 4th years to clear his debt?

**Solution:**

Principal (P) = Rs. 24000

Rate (R) = 7.5% P.A.

Time (T) = 4 Years

$$\text{S.I.} = \frac{P \times T \times R}{100}$$

$$= \text{Rs. } \frac{24,000 \times 4 \times 7.5}{100}$$

$$= \text{Rs. } 240 \times 4 \times 7.5$$

$$= 240 \times 30 = \text{Rs. } 7200$$

Amount needed to clear the debt at the end of 4<sup>th</sup> year

$$= \text{Rs. } 24000 + \text{Rs. } 7200 = \text{Rs. } 3,1200$$

**Question 3.**

The interest on a certain sum of money is Rs. 1,480 in 2 years and at 10 per cent per year. Find the sum of money.

**Solution:**

Let P = Rs. X

Time (T) = 2 Years

Rate (R) = 10%

$$\therefore \text{Interest} = \frac{P \times T \times R}{100} = \frac{x \times 2 \times 10}{100} = \frac{x}{5}$$

$$\frac{x}{5} = \text{Rs. } 1480 \quad (\text{Given})$$

$$\therefore x = 1480 \times 5 = \text{Rs. } 7400$$

Hence the money Rs.7400

**Question 4.**

On what principal will the simple interest be Rs. 7,008 in 6 years 3 months at 5% per year?

**Solution:**

Let principal = Rs.P

Time (T) = 6 Years 3 month = 6 Year +  $\frac{3}{12}$

$$\text{Year} = \frac{75}{12} = \frac{25}{4} \text{ year} = 6 \frac{1}{4} \text{ years}$$

Rate (R) = 5%

Simple interest = Rs. 7,008

We know that

$$\text{Simple interest} = \frac{P \times T \times R}{100}$$

$$7,008 = \frac{P \times \frac{25}{4} \times 5}{100} \Rightarrow P = \frac{7008 \times 100 \times 4}{25 \times 5}$$

$$= \frac{7008 \times 16}{5} = \frac{112128}{5} = \text{Rs. } 22425.60$$

### Question 5.

Find the principal which will amount to Rs. 4,000 in 4 years at 6.25% per annum.

#### Solution:

Let Principal = Rs P, Time (T) = 4 Years

$$\text{Rate} = 6\frac{1}{4} = \frac{25}{4} \%$$

$$\text{Simple Interest} = \frac{P \times T \times R}{100} = \frac{P \times \frac{25}{4} \times 4}{100} = \frac{P}{4}$$

$$\therefore \text{Amount} = P + \frac{P}{4} = \frac{5P}{4}$$

$$\frac{5P}{4} = 4000$$

$$\Rightarrow 5P = 4 \times 4000$$

$$\Rightarrow P = \text{Rs. } 3200$$

Hence Principal = Rs.3200

### Question 6.

(i) At what rate per cent per annum will Rs. 630 produce an interest of Rs. 126 in 4 years?

#### Solution:

$$P = \text{Rs. } 630, I = \text{Rs. } 126, T = 4$$

$$R = \frac{100 \times I}{P \times T} = \frac{100 \times 126}{630 \times 4} = \frac{100}{20} = 5\%$$

(ii) At what rate per cent per year will a sum double itself in  $6\frac{1}{4}$  years?

#### Solution:

Let P = Rs.100

$$\therefore \text{Amount} = 2 \times \text{Rs. } 100 = \text{Rs. } 200$$

Interest = A - P

= Rs.200 - Rs.100 = Rs.100

$T = 6\frac{1}{4}$  years =  $\frac{25}{4}$  years

$R = \frac{100 \times I}{P \times T} = \frac{100 \times 100}{100 \times \frac{25}{4}} \% = \frac{100 \times 100}{100} \times \frac{4}{25} = 16\%$

**Question 7.**

(i) In how many years will Rs. 950 produce Rs. 399 as simple interest at 7%?

**Solution:**

P = Rs.950

S.I = Rs.3900

R = 7%

We know that:

$$T = \frac{100 \times I}{P \times R} = \frac{100 \times 399}{950 \times 7}$$
$$= \frac{10 \times 21}{5 \times 7} = 2 \times 3 = 6 \text{ Years}$$

(ii) Find the time in which Rs. 1200 will amount to Rs. 1536 at 3.5% per year.

**Solution:**

A = Rs.1536

P = Rs.1200

I = A - P

= Rs.1536 - Rs.1200 = Rs.336

We know that

$$T = \frac{100 \times I}{P \times R} \quad (\text{Formula})$$
$$= \frac{100 \times 336}{1200 \times 3.5} = \frac{100 \times 336 \times 10}{1200 \times 35} \quad \left[ \because \frac{1}{3.5} = \frac{10}{35} \right]$$

$$= \frac{28 \times 10}{35} = 8 \text{ Years}$$

**Question 8.**

The simple interest on a certain sum of money is  $\frac{3}{8}$  of the sum in 64 years. Find the rate percent charged.

**Solution:**

Let P = RS.8

$$S.I = \text{Rs.} \frac{3}{8} \times 8$$

= Rs.3

$$T = 6\frac{1}{4} \text{ years} = \frac{25}{4} \text{ Years}$$

We know that:

$$\begin{aligned} R &= \frac{100 \times I}{P \times T} \\ &= \frac{100 \times 3}{8 \times \frac{25}{4}} = \frac{100 \times 3}{8} \times \frac{4}{25} = 2 \times 3 \text{ (Formula)} \\ &= 6\% \end{aligned}$$

**Question 9.**

What sum of money borrowed on 24<sup>th</sup> May will amount to Rs.10210.20 on 17<sup>th</sup> October of the same year at 5 percent per annum simple interest?

**Solution:**

A = Rs.10210.20

R = 5% P.A

T = May + June + July + August + Sept + Oct

$$= 7 + 30 + 31 + 31 + 30 + 17$$

$$= \frac{146}{365} \text{ days} = \frac{2}{5} \text{ Year}$$

We know that:

$$P + I = A$$

(Formula for finding principal)

$$\Rightarrow P + \frac{P \times R \times T}{100} = A$$

$$\Rightarrow P \left( 1 + \frac{5 \times 2}{100} \right) = \text{Rs. } 10210 \cdot 2$$

$$\Rightarrow P \left( 1 + \frac{R \times T}{100} \right) = A$$

$$\Rightarrow P \left( 1 + \frac{2}{100} \right) = \text{Rs. } 10210 \cdot 20$$

$$\Rightarrow P \left( \frac{102}{100} \right) = \text{Rs. } 10210 \cdot 20$$

$$\Rightarrow P = \text{Rs. } 10210 \cdot 20 \times \frac{100}{102}$$

$$\Rightarrow P = \text{Rs. } \frac{1021020}{102}$$

$$\Rightarrow P = \text{Rs. } 10010$$

$\therefore$  Money to be borrowed = Rs.10010

#### Question 10.

In what time will the interest on a certain sum of money at 6% be  $\frac{5}{8}$  of itself?

**Solution:**

Let P = Rs.8

Interest =  $\text{Rs. } 8 \cdot \frac{5}{8} = \text{Rs. } 5$  (Converting the mixed fraction into normal one)

R = 6%

$$T = \frac{100 \times 1}{P \times R}$$

$$= \frac{100 \times 5}{8 \times 6}$$

$$= \frac{500}{48} = \frac{125}{12} \text{ Years}$$

$$= 10 \frac{5}{12} \text{ Years}$$

= 10 Years 5 months

$$\left[ \because \frac{5}{12} \text{ year} = \frac{5}{12} \times 12 \text{ months} = 5 \text{ months} \right]$$

Time = 10 years 5 months

