

## SIMPLE INTEREST INTRODUCTION

Interest is defined as 'Time Value of Money'. It works under the basic principle that value of money is not fixed, and it will keep changing over the period of time. In this chapter, we are going to study two types of interest, namely simple interest (SI) and compound interest (CI).

## SIMPLE INTEREST

In case of simple interest, the interest as well as the principal remains fixed for every compounding period.

### Expression for Simple Interest

$$SI = \frac{\text{Principal} \times \text{Rate of Interest} \times \text{Time}}{100}$$

### Remember

- If the rate of interest = R% per annum for both CI and SI, then the difference between CI and SI for 2 yr will be equal to (R% of R)% of principal =  $\frac{R^2}{100}$  % of principal. In the above case, R = 10%, so the difference between CI and SI for 2 yr is 1%.
- If a sum doubles itself in n years at SI, then rate of interest =  $\frac{100}{n}$ .
- At SI, if a sum of money amount to n times in t years, then rate of interest =  $\frac{(n-1)}{T} 100\%$ .

### TYPE

A sum of Rs. 2000 is given on at the rate of 10% at simple interest for 3 years. Find the simple Interest?

#### Solution:

$$10\% \rightarrow \frac{1}{10} \rightarrow \frac{3 \times 1}{10} \rightarrow \frac{3(SI)}{10}$$

$$10 \rightarrow 2000$$

$$1 \rightarrow 200$$

$$3 \rightarrow 600$$

### TYPE

A sum of Rs. 2000 is given on at the rate of 10% at simple interest for 3 years. Find the amount after 3 years?

#### Solution:

$$10\% \rightarrow \frac{1}{10} \rightarrow \frac{3 \times 1}{10} \rightarrow \frac{3}{10} \rightarrow \frac{13(A)}{10}$$

$$10 \rightarrow 2000$$

$$1 \rightarrow 200$$

$$13 \rightarrow 2600$$

### TYPE

A sum of Rs. 2000 is amounts to 2600 at a certain rate of simple interest for 3 years. Find the rate?

#### Solution:

$$\frac{2600}{2000} \rightarrow \frac{13}{10} \rightarrow \frac{13-10}{10} \rightarrow \frac{3(3 \text{ yr})}{10} \rightarrow \frac{1(1 \text{ yr})}{10}$$

$$\text{Rate} = 1/10 \rightarrow 10\%$$

### TYPE

A sum of Rs. 2000 is amounts to 2600 at the rate of 10% at simple interest in a certain period. Find the number of years?

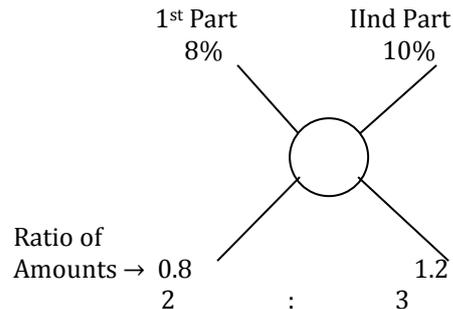
#### Solution:

$$10\% = \frac{1(1 \text{ yr})}{10} \text{ compare to } \frac{2600}{2000} \rightarrow \frac{13}{10} \rightarrow \frac{3}{10}$$

so  $\frac{1}{10}$  become  $\frac{3}{10}$  in 3 years

### TYPE

A sum of Rs. 10000 is lent partly at 8% and remaining at 10% per annum. If the yearly interest on the average is 9.2%, the two parts are:



According to the question,  
 $(2 + 3)$  units = Rs. 10000  
 $5$  units = Rs. 10000  
 $1$  unit = Rs. 2000  
Hence amount invested at 8% = 2 units  
 $= 2 \times 2000 = \text{Rs. } 4000$   
Amount invested at 10% = 3 units

### TYPE

A man loses Rs. 55.50 yearly when the annual rate of interest falls from 11.5% to 10%. His capital (in rupees) is

#### Solution:

$$11.5 \downarrow 10 \rightarrow 1.5$$

$$1.5\% \rightarrow 55.5$$

$$1 \rightarrow 55.5/1.5 \rightarrow 3700$$

### TYPE

A sum of money at simple interest amounts to 1,012 in  $5/2$  years and to Rs. 1067.20 in 4 years. The rate of interest per annum is

#### Solution:

$$P \rightarrow 1012 \rightarrow 1067.2$$

$$P \xrightarrow{5/2 \text{ yrs}} 1012 \xrightarrow{3/2 \text{ yrs} + 55.2} 1067.2$$

$$\text{Interest in 1st year} = \frac{55.20}{3} \times 2 = \text{Rs. } 36.80$$

$$\text{Interest in 4 years} = 36.80 \times 4 = \text{Rs. } 147.2$$

$$\text{Principal} = \text{Amount} - \text{Interest} = 1067.20 - 147.20 = \text{Rs. } 920$$

$$\text{Required rate\%} = \frac{36.80}{920} \times 100 = 4\%$$

### TYPE

Out of Rs. 50,000, that a man has, he lends Rs. 8000 at 5.5% per annum simple interest and Rs. 24,000 at 6% per annum simple interest. He lends the remaining money at a certain rate of interest so that he gets total annual interest of Rs. 3680, The rate of interest per annum, at which the remaining money is lent, is:

**Solution:**

Remaining amount =  
 $50000 - (8000 + 24000)$   
 = Rs. 18000

Let rate of interest = R %

According to the question,  

$$\left(\frac{44000}{100}\right) + \frac{144000}{100} + \frac{18000R}{100} = 3880$$

$$\frac{188000}{100} + \frac{18000R}{100} = 3880$$

$$\frac{18000R}{100} = 3680 - 1880$$

$$180R = 1800$$

Rs. 10%

Hence, Required Rate = 10%

**TYPE**

A sum was invested on simple interest at a certain rate for 2 years. Had it been put at 3% higher rate it would have fetched Rs. 72 more. The sum is

**Solution:**

$$3\% \rightarrow \frac{3}{10} \rightarrow \frac{3 \times 2}{10} \rightarrow \frac{6}{10} \rightarrow \frac{6 \rightarrow 72}{10 \rightarrow ?} \rightarrow 1200 \text{ ans}$$

**TYPE**

Rs. 800 becomes Rs. 956 in 3 years at a certain rate of simple interest, If the rate of interest is increased by 4%, what amount will Rs. 800 become in 3 years P

**Solution:**

$$4\% \rightarrow \frac{1}{25} \rightarrow \frac{3}{25} \rightarrow \frac{3 \xrightarrow{\times 32} ?}{25 \xrightarrow{\times 32} 800} \rightarrow 96$$

$$956 + 96 = 1052$$

**Previous year questions****Q1.**

A certain amount earns simple Interest of Rs. 1,750/- after 7 years. Had the interest been 2% more, how much more interest would it have earned ?

- (a) Rs. 35/-
- (b) Rs. 350/-
- (c) Rs. 245/-
- (d) Cannot be determined
- (e) None of these

**Q2.**

Vishwas borrowed a total amount of Rs. 30,000 part of it on simple interest, rate of 12 p.c.p.a. and remaining on simple interest rate of 10 p.c.p.a. If at the end of 2 years he paid in all Rs. 36,480 to settle the loan amount, what was the amount borrowed at 12 p.c.p.a.?

- (a) Rs. 16000
- (b) Rs. 18000
- (c) Rs. 17500
- (d) Rs. 12000
- (e) None of these

**Q3.**

The simple interest accrued on an amount of Rs. 2,500 at the end of six years is Rs. 1,875. What would be the simple interest accrued on an amount of Rs. 6,875 at the same rate and same period ?

- (a) Rs. 4556.5
- (b) Rs. 5,025.25
- (c) Rs. 4,895.25
- (d) Rs. 5,245.5
- (e) None of these

**Q4.**

What amount a man would have received on a principal of Rs. 4,000 after two years at simple interest at the rate of 5 per cent per annum ?

- (a) Rs. 4,161
- (b) Rs. 5,200
- (c) Rs. 4,400
- (d) Rs. 4,100.
- (e) Rs. 4,190

**Q5.**

Shamita took a loan at simple interest rate of 6 p.c.p.a. in the first year and it increased by 1.5 p.c.p.a. every year. If she pays Rs. 8,190 as interest at the end of 3 years, what was her loan amount?

- (a) Rs. 36000
- (b) Rs. 35400
- (c) Rs. 36800
- (d) Cannot be determined
- (e) None of these

**Q6.**

Arun invested a sum of money at a certain rate of simple interest for a period of four years. Had he invested the same sum for a period of six years the total interest earned by him would have been fifty percent more than the earlier interest amount. What was the rate of interest per cent per annum ?

- (a) 4%
- (b) 8%
- (c) 5%
- (d) Cannot be determined
- (e) None of these

**Q7.**

The simple interest accrued on a sum of certain principal is 1,200 in four years at the rate of 8 p.c.p.a. What would be the simple interest accrued on thrice of that principal at the rate of 6 p.c.p.a. in 3 years ?

- (a) Rs. 2,025
- (b) Rs. 3,025
- (c) Rs. 2,256
- (d) Rs. 2,150
- (e) None of these

**Q8.**

What total amount would Mithilesh get at the end of three years if he invests an amount of Rs. 11,200 in a

scheme which offers simple interest at the rate of 8.5 p. c. p. a. for three years?

- (a) Rs. 14,056
- (b) Rs. 14,348
- (c) Rs. 13,852
- (d) Rs. 15,064
- (e) None of these

**Q9.**

Ravi borrowed some money at the rate of 4 p.c.p.a. for the first three years, at the rate of 8 p.c.p.a. for the next two years and at the rate of 9 p.c.p.a. for the period beyond 5 years. If he pays a total simple interest of Rs. 19,550 at the end of 7 years, how much money did he borrow?

- (a) Rs. 39,500
- (b) Rs. 42,500
- (c) Rs. 41,900
- (d) Rs. 43,000
- (e) None of these

**Q10.**

A sum of Rs. 3200 becomes Rs. 3456 in two years at a certain rate of simple interest. What is the rate of interest per annum ?

- (a) 5.50%
- (b) 6%
- (c) 4%
- (d) 4.50%
- (e) None of these

**Q11.**

A sum of Rs. 2200 is invested at two different rates of interest. The difference between the interest got after 4 years is Rs. 202.40. What is the difference between the rate of interest ?

- (a) 3.30%
- (b) 2.30%
- (c) 3.50%
- (d) 2.50%
- (e) None of these

**Q12.**

A sum of Rs. 16800 is divided into two parts. One part is lent at the simple interest of 6% per annum and the other at 8% per annum. After 2 years total sum received is Rs. 19000. The sum lent at 6% of simple interest is

- (a) Rs. 12200
- (b) Rs. 12000
- (c) Rs. 11000
- (d) 710000
- (e) None of these

**Q13.**

What will be the difference between the interest accrued on a sum of Rs. 4500 at 12% per annum for 2 years and that on a sum of Rs. 5600 at 9% per annum for 2 years ?

- (a) Rs. 75
- (b) Rs. 72
- (c) Rs. 69
- (d) 76
- (e) None of these

**Q14.**

A sum was invested at a certain rate of simple interest for two years. If the sum were invested at 3% more rate of interest, it would have fetched Rs. Rs.2 more. What is the sum ?

- (a) Rs. 1000
- (b) Rs. 1200
- (c) 71150
- (d) 71250
- (e) None of these

**Q15.**

The sum invested in scheme B is twice the sum invested in scheme A. Investment in scheme A is made for 3 years at 8% p.a. simple interest and in Scheme B for 2 years at 9% p.a. simple interest. The total interest earned from both the schemes is Rs. 1800. How much was invested in Scheme A ?

- (a) Rs. 4000
- (b) Rs. 3500
- (c) Rs. 3000
- (d) Rs. 2500
- (e) Rs. 4500-

**Q16.**

The interest earned when Rs. 'P' is invested for four years in a scheme offering 9% p.a. simple interest is more than the interest earned when the same sum (Rs. P) is invested for two years in another scheme offering 12% p.a. simple interest, by Rs. 360. What is the value of P ?

- (a) 2000
- (b) 3500
- (c) 2500
- (d) 4000
- (e) 3000

**Q17.**

Mr. A lends 40% of sum at 15% p.a. 50% of rest sum at 10% p.a. and the rest at 18% p.a. rate of interest. What would be the rate of interest if the interest is calculated on the whole sum?

- (a) 13.4% p.a.
- (b) 14.33% p.a.
- (c) 14.4% p.a.
- (d) 13.33% p.a.
- (e) None of these

**Q18.**

A sum of Rs. 5000/- amounts to Rs. 6,050/- in two years. What is the rate of interest?

- (a) 15% p.a.
- (b) 13% p.a.



- (c) 11% p.a.
- (d) 21% p.a.
- (e) None of these

**Q19.**

Srinivasan invests two equal amounts in two banks giving 10% and 12% Tate of interest respectively. At the end of year the interest earned is Rs. 1650/. Find the sum invested in each.

- (a)Rs. 8,500/-
- (b)Rs. 15,000/-
- (c)Rs. 7,500/-
- (d)Rs. 17,000/-
- (e) None of these

**Q20.**

Rs. 800 becomes Rs. 956 in 3 years at certain simple rate of interest. If the rate of interest is increased by 4%, what amount will Rs. 800 become in 3 years?

- (a)Rs. 1020.8
- (b)Rs. 1025
- (c)Rs. 1052
- (d)Data inadequate
- (e)None of these

**Q21.**

Veena obtained an amount of Rs. 8,376 as simple interest on a certain amount at 8 p.c.p.a. after 6 years. What is the amount invested by Veena ?

- (a) Rs. 17,180
- (b) Rs. 18,110
- (c) Rs. 16,660 ,
- (d) Rs. 17,450
- (e) None of these

**Q22.**

Equal amounts are invested in two schemes A and B for 6 years and 8 years respectively: Scheme A offers interest at the rate of 12% per annum and scheme B offers interest at the rate of 8% per annum. The difference between the interests earned is Rs. 1280, What is the amount invested in each scheme ?

- (a) Rs. 16000
- (b) Rs. 16500
- (c) Rs. 17000
- (d) Rs. 18000
- (e) None of these

**Q23.**

Rs. 16,000 was invested for three " years, partly in Scheme A at therate of 5% Simple Interest per annum and partly in scheme B at the rate of 8% Simple Interest per annum. Total interest received at the end was Rs. 3480. How much sum of money invested in Scheme A ?'

- (a) Rs. 6,000
- (b) Rs. 6,500
- (c) Rs. 4,500
- (d) Rs. 4,000

- (e) Rs. 8,000

**Q24.**

A took a certain sum as loan from bank at a rate of 8% simple interest per annum. A lends the same amount to B at 12% simple interest per annum. If at the end of five years, A made profit of Rs. 800 front the deal, how much was the original sum ?

- (a) Rs. 6,500
- (b) Rs. 4,000 .
- (c) Rs. 6,200
- (d) Rs. 6,000
- (e) Rs. 4,500

**Q25.**

A sum of money at simple interest amounts to Rs. 14,160 in 3 years. If the rate of interest is increased to 25%, the same sum amounts to 14,700 in the same time. The rate of interest is

- (a)5%
- (b)5.50%
- (c)6%
- (d)7%
- (e)

**Q26.**

Simple interest on a certain sum at a certain annual rate of Interest is 16% of the sum. If the numbers representing rate percent and time in years be equal, then the rate of interest is

- (a)4%
- (b)6%
- (c)4.50%
- (d)6.50%
- (e) None of these

**Q27.**

The annual income of Adhiraj is Rs. 702000. He spends 18% of his monthly income on payments of bills, 14% on domestic needs, 16% on children's education and 6% on donations. He invests 2/3 rd of the remaining amount in mutual fund. Find the remaining amount with Adhiraj.

- (a)Rs. 8770
- (b)Rs. 8870
- (c)Rs. 8790
- (d)Rs. 8970
- (e) None of these

**Q28.**

The difference between the com-pound interest and simple interest on a sum of Rs. 18000 at the same rate of interest for 2 years is Rs. 405. What is the rate of interest per cent per annum?

- (a)15%
- (b)12%
- (c)14%
- (d)10%
- (e) None of these



**ANSWERS :**

1 d    2 d    3 e    4 c    5 e    6 d    7 a    8 a    9 b    10 c    11 b    12 a    13 b    14  
b    15 c    16 e    17 c    18 e    19 c    20 c    21 d    22 a    23 d    24 b    25 c    26 a    27 d    28  
a