2. Simple Interest

Let us Work Out 2

1. Question

Two friends together took a loan amount ₹15,000 to run a business from a bank at the rate of simple interest of 12% per annum. Let us write, by calculating, the interest they have to pay after 4 yrs.

Answer

In mathematical language, the problem is

Principal (Rs.)	Time (Year)	Interest (Rs.)
100	1	12
15,000	4	?

In that bank, the rate of simple interest is 12%.

So, the interest of Rs. 100 in 1 yr is Rs. 12

The interest of Rs. 1 in 1 yr is Rs. $\frac{12}{100}$

⇒ The interest of Rs. 15,000 in 1 yr is $\frac{12}{100} \times 15000$

= Rs. 1,800

⇒ The interest of Rs. 15,000 in 4 yr is $= \frac{12}{100} \times 15000 \times 4$

= Rs. 7,200

The total interest paid by them = Rs. 7,200

2. Question

Let us determine the interest of ₹2000 at the rate if simple interest of 6% per annum from 1st January to 26th May, 2005.

Answer

Time = January 31 days + February 28 days + March 31 days + April 30 days + May 25 days

= 145 Days

$$\Rightarrow \frac{145}{365} = \frac{29}{13} \text{ yrs}$$

In mathematical language the problem is

Principal (Rs.)	Time (Yr)	Interest (Rs.)
100	1	6
2000	$\frac{29}{13}$	?

So, the interest of Rs. 100 in 1 yr is Rs. 6

⇒ The interest of Rs. 1 in 1 yr is Rs. $\frac{6}{100}$

⇒ The interest of Rs. 2000 in 1 yr is

$$= \frac{6}{100} \times 2000$$

= Rs. 120

⇒ The interest of Rs. 2,000 in $\frac{29}{13}$ yr is

$$= \frac{6}{100} \times 2000 \times \frac{29}{13}$$

= Rs. 267.7

The total interest paid by them = Rs. 267.7

3. Question

Let us determine the amount (Principal along with interest)of ₹960 at the rate of simple interest of $8\frac{1}{3}$ % annum for 1 yr. 3months.

Answer

Time = 1 yr + 3 months

3months $= \frac{3}{12} = \frac{1}{4}$ yr

$\Rightarrow \frac{1}{4} + 1 = \frac{5}{4}$ yr

In mathematical language, the problem is

Principal (Rs.)	Time (year)	Interest (Rs.)
100	1	$\frac{25}{3}$
960	$\frac{5}{4}$	?

So, the interest of Rs. 100 in 1 yr is Rs. $\frac{25}{3}$

⇒ The interest of Rs. 1 in 1 yr is Rs. $\frac{25}{3 \times 100}$

⇒ The interest of Rs. 960 in 1 yr is Rs.

$$= \frac{25 \times 960}{3 \times 100}$$

= Rs. 80

⇒ The interest rate of Rs. 960 in $\frac{5}{4}$ yr is

$$= \frac{5}{4} \times 80 = 100$$

= Rs. 100

Amount (Principal along with interest)

= Interest + Principal

= 100 + 960 = Rs. 1060

4. Question

Utplalbabu took a loan ₹3200 for 2 yrs. From a Cooperative bank for the cultivation of his land at the rate of simple interest of 6% per annum. Let us write by calculating, the amount he has to repay after 2yrs.

Answer

As we know,

$$\text{I (Interest)} = \text{Rs.} \frac{p \times r \times t}{100}$$

Here, p = Rs. 3200, r = 6 , t = 2 and I = ?

$$\Rightarrow I = \frac{3200 \times 6 \times 2}{100}$$

= Rs. 384

Amount (Principal along with interest)

= Interest + Principal

= 384 + 3200 = Rs. 3584

Hence, Rs. 3200 he has to pay after 2 yrs.

5. Question

Sovadebi deposited some amount of money in a bank at the rate of simple interest of 5.25% per annum. After 2yrs. She has got ₹840 as interest. Let us

write by calculating, the money she has deposited in the bank.

Answer

As we know,

$$\text{I (Interest)} = \text{Rs.}\frac{\text{p} \times \text{r} \times \text{t}}{100}$$

Here, P = ?, r = 5.25 t = 2 and I = Rs. 840

$$\Rightarrow 840 = \text{Rs.}\frac{\text{p} \times 5.25 \times 2}{100}$$

$$\Rightarrow \text{p} = \frac{840 \times 100}{5.25 \times 2}$$

= Rs. 8000

Hence, she has deposited Rs. 8000 in the bank.

6. Question

Goutam took a loan of some money from a Cooperative bank for opening a poultry farm atthe rate of simple interest of 12% per annum. Every month he has to repay ₹378 as interest. Let us determine the loan amount taken by him.

Answer

Time = 1 month = $\frac{1}{12}$ yr

As we know,

$$\text{I (Interest)} = \text{Rs.}\frac{\text{p} \times \text{r} \times \text{t}}{100}$$

Here, P = ?, r = 12, t = $\frac{1}{12}$ yr and I = Rs. 378

$$\Rightarrow 378 = \frac{\text{p} \times 12 \times 1}{100 \times 12}$$

$$\Rightarrow \text{p} = \frac{378 \times 100}{1}$$

= Rs. 37800

Hence, loan amount taken by him Rs. 37800

7. Question

Let us write by calculating, the number of yrs for which an amount becomes twice of its principal having the rate of simple interest of 6% per annum.

Answer

Interest = Amount – Principal

Let, Principal = p, Amount = 2p

⇒ Interest = 2p – p = p

As we know,

$$\text{I (Interest)} = \frac{\text{p} \times \text{r} \times \text{t}}{100}$$

Here, P = p, r = 6 , t = ? and I = p

$$\Rightarrow \text{p} = \frac{\text{p} \times 6 \times \text{t}}{100}$$

$$\Rightarrow \text{t} = \frac{100}{6} = \frac{50}{3}\text{yr}$$

8. Question

Mannan Miyan observed, after 6 years of taking a loan of some money, that the interest to be paid had become $\frac{3}{8}$th of its principal. Let us determine the rate of simple interest in percent per annum.

Answer

Let's loan taken by Mannan Miyan was = p

So, the interest paid becomes = $\frac{3}{8}$p

As we know,

$$\text{I(Interest)} = \text{Rs.}\frac{\text{p} \times \text{r} \times \text{t}}{100}$$

Here, P = p, r = ?, t = 6 yr and $\text{I} = \frac{3}{8}\text{p}$

$$\Rightarrow \frac{3}{8}\text{p} = \frac{\text{p} \times \text{r} \times 6}{100}$$

$$\Rightarrow \frac{3}{8} = \frac{6 \times \text{r}}{100}$$

$$\Rightarrow \text{r} = \frac{300}{48} = \frac{25}{4}$$

Hence, the rate of simple interest in percent per annum is $\frac{25}{4}$.

9. Question

An agricultural Co-operative society gives agricultural loan to its members at the rate of simple interest of 4% per annum. But an interest is to be given at the rate of simple interest of 7.4% per annum for a loan taken from the bank. If a farmer being a member of the Co-operative society takes a loan of ₹5000 from it instead of taking loan from the bank, the let us write, by calculating the money to be saved as interest per annum.

Answer

When farmer takes loan from agricultural society:

P = Rs. 5000, r = 4, t = 1 and I = ?

As we know,

$$\text{I(Interest)} = \frac{\text{p} \times \text{r} \times \text{t}}{100}$$

$$\Rightarrow \text{I} = \frac{5000 \times 4 \times 1}{100}$$

⇒ I = Rs. 200

When a farmer takes loan from the bank:

P = Rs. 5000, r = 7.4, t = 1 and I = ?

As we know,

$$\text{I(Interest)} = \frac{\text{p} \times \text{r} \times \text{t}}{100}$$

$$\Rightarrow \text{I} = \frac{5000 \times 7.4 \times 1}{100}$$

⇒ I = Rs. 370

Hence, the money saved by farmer

= Interest(when loan is taken from bank) – Interest(from agricultural society)

⇒ 370 – 200 = Rs. 170

Hence, money saved by farmer = Rs. 270

10. Question

If the interest of ₹292 in 1 day be 1 paise, then let us write by calculating, the rate of simple interest in percent per annum.

Answer

P = Rs. 292, r = ?, t = $\frac{1}{365}$ yr and I = Rs. .01

As we know,

$$\text{I (Interest)} = \frac{p \times r \times t}{100}$$

$$\Rightarrow .01 = \frac{292 \times r \times 1}{100 \times 365}$$

$$r = \frac{365}{292} = 1.25$$

Hence, the rate of simple interest per annum is 1.25.

11. Question

Let us write, by calculating the number of yrs. for which the interest of ₹600 at the rate of simple interest of 8% per annum will be ₹168.

Answer

P = Rs. 600, r = 8, t = ? and I = Rs. 168

As we know,

$$\text{I(Interest)} = \frac{p \times r \times t}{100}$$

$$\Rightarrow 168 = \frac{600 \times 8 \times t}{100}$$

$$\Rightarrow t = \frac{168}{48} = 3.5 \text{ yr}$$

Hence, The number years are 3.5

12. Question

If I get ₹1200 return as amount (principal along with interest) by depositing ₹800in the bankat the rate of simple interest of 10% per annum, then let us write by calculating, the time for which the money was deposited in the bank.

Answer

Interest = Amount – Principal

⇒ Interest = Rs. 1200 – Rs. 800

⇒ Interest = Rs. 400

P = Rs. 800, r = 10, t = ? and I = Rs. 400

As we know,

$$I(\text{Interest}) = \frac{p \times r \times t}{100}$$

$$\Rightarrow 400 = \frac{800 \times 10 \times t}{100}$$

$$\Rightarrow t = \frac{400}{80} = 5\,\text{yr}$$

Hence, for 5 yr money was deposited in the bank.

13. Question

At the same rate of simple interest in percent per annum, if a principal becomes the amount of ₹7100 in 7 yrs. and of ₹6200 in 4 yrs., let us determine the principal and rate of simple interest in percent per annum.

Answer

Case 1:

Amount = Principal + Interest

P = p, r = ?, t = 7 yrs and I = I

As we know,

$$I(\text{Interest}) = \frac{p \times r \times t}{100}$$

$$\Rightarrow I = \frac{p \times r \times 7}{100}$$

$$\Rightarrow I = \frac{7pr}{100}$$

$$\Rightarrow \text{Rs. } 7100 = p + \frac{7pr}{100}$$

$$\Rightarrow 7100 = p(1 + \frac{7r}{100})$$

Case 2:

P = p, r = ?, t = 4 yrs and I = I

As we know,

$$I\,(\text{Interest}) = \frac{p \times r \times t}{100}$$

$$\Rightarrow I = \frac{p \times r \times 4}{100}$$

$$\Rightarrow I = \frac{pr}{25}$$

Amount = Principal + Interest

$$\Rightarrow \text{Rs. } 6200 = p + \frac{pr}{25}$$

$$\Rightarrow 6200 = p\left(1 + \frac{r}{25}\right)$$

Dividing the above equations we get,

$$\Rightarrow \frac{7100}{6200} = \frac{\frac{100 + 7r}{100}}{\frac{25 + r}{25}}$$

$$\Rightarrow \frac{71}{62} = \frac{100 + 7r}{4(25 + r)}$$

$$\Rightarrow 7100 + 284r = 6200 + 434r$$

$$\Rightarrow 900 = 150r$$

$$\Rightarrow r = \frac{900}{150} = 6$$

To find the value of principal putting the value of r in any equation

$$\Rightarrow 7100 = p\left(\frac{100 + 42}{100}\right)$$

$$\Rightarrow p = \frac{7100 \times 100}{142} = \text{Rs. } 5000$$

14. Question

Amal Roy deposits ₹2000 in the bank and Poshupoti Ghosh deposits ₹2000 in the post office at the same time. After 3 yrs. they get the return amounts ₹2360 and ₹2480 respectively. Let us write by calculating, the ratio of the rate of simple interest in percent per annum in the bank and that of in the post office.

Answer

Case 1:

Interest = Amount – Principal

$\Rightarrow$ Interest = 2360 – 2000 = Rs. 360

P = Rs. 2000, R = ?, t = 3, I = Rs. 360

As we know,

$$I = \frac{p \times r \times t}{100}$$

$$\Rightarrow 360 = \frac{2000 \times R \times 3}{100}$$

$$\Rightarrow R = \frac{360}{60}$$

$\Rightarrow R = 6$

Case 2:

Interest = Amount – Principal

$\Rightarrow$ Interest = 2480 – 2000 = Rs. 480

As we know,

$$I = \frac{p \times r \times t}{100}$$

$$\Rightarrow 480 = \frac{2000 \times r \times 3}{100}$$

$$\Rightarrow r = \frac{480}{60}$$

$\Rightarrow r = 8$

Hence, the ratio of the rate of simple interest per annum in bank to the post office

$$\Rightarrow \frac{R}{r} = \frac{6}{8} = \frac{3}{4}$$

$$= \frac{3}{4}$$

15. Question

A weaver Cooperative society takes a loan of ₹15,000 at the time of buying a power loom. After 5 yrs. the society has to repay ₹22125 for recovering the loan. Let us determine the rate of simple interest in percent per annum.

Answer

Interest = Amount – Principle

$\Rightarrow$ I = Rs. 22125 – Rs. 15000

$\Rightarrow$ I = Rs. 7125

P = Rs. 15000, r = ?, t = 5 yrs and I = Rs. 7125

As we know,

$$I = \frac{p \times r \times t}{100}$$

$$\Rightarrow 7125 = \frac{15000 \times r \times 5}{100}$$

$$\Rightarrow r = \frac{7125}{750}$$

$\Rightarrow r = 9.5$

Hence, rate of simple interest per annum is 9.5%.

16. Question

Aslamchacha got ₹1,00,00 when he retired from his service. He deposited some of that money in the bank and rest of his money in the post office and got ₹5400 in total per year as interest. If the rates of simple interest per annum in the and in the post office are 5% and 6%, respectively, then us write by calculating, the money he had deposited in the bank and post office.

Answer

Case 1: Money deposited in bank

P = 10000 - p, r = 5, t = 1 and I = ?

As we know,

$$I\,(\text{Interest}) = \frac{p \times r \times t}{100}$$

$$\Rightarrow I = \frac{(10000 - p) \times 5 \times 1}{100}$$

$$\Rightarrow I = \frac{(10000 - p) \times 5}{100}$$

Case 2:For money deposited in the post-office

P = p, r = 6, t = 1 and I = ?

As we know,

$$I(\text{Interest}) = \frac{p \times r \times t}{100}$$

$$\Rightarrow I = \frac{p \times 6 \times 1}{100}$$

From question, the total interest is

= Interest from bank + Interest from post-office

$$\Rightarrow 5400 = \frac{(10000 - p) \times 5}{100} + \frac{p \times 6}{100}$$

⇒ 540000 = -5p + 50000 + 6p

⇒ p = Rs 49,000

17. Question

Rekhadidi deposited ₹10,000 of her savings in two separate banks at the same time. The rate of simple interest per annum is of 6% in one bank and that of 7% in other bank; after 2 yrs., if she gets ₹1280 in total as interest, then let us writhe by calculating, the money she had deposited separately in each of two banks.

Answer

Case 1: For money deposited in first bank

P = p, r = 6, t = 2 and I = ?

As we know,

$$I(\text{Interest}) = \frac{p \times r \times t}{100}$$

$$\Rightarrow I = \frac{p \times 6 \times 2}{100}$$

$$\Rightarrow I = \frac{12p}{100}$$

Case 2: For money deposited in second bank

P = 10000 – p, r = 7, t = 2 and I = ?

As we know,

$$\Rightarrow I = \frac{p \times r \times t}{100}$$

$$\Rightarrow I = \frac{(10000 - p) \times 7 \times 2}{100}$$

From question the total interest is Rs. 1280

$$\Rightarrow 1280 = \frac{12p}{100} + \frac{14(10000-p)}{100}$$

⇒ 128000 = 12p + 140000 – 14p

⇒ 2p = 140000 – 128000

$$\Rightarrow p = \frac{12000}{2} = 6000$$

Money deposited in Second bank = 10000 – p

= 10000 – 6000 = Rs. 4000

Hence, she deposited Rs. 6000 in first bank and Rs. 4000 in another bank.

18. Question

A bank gives 5% simple interest per annum. In the bank, Dipubabu deposits₹ 15,000 at the beginning of the year, but withdraws ₹3000 after 3 months and then again, ater 3 months he deposits ₹8000. Let us determine the amount (Principalalong with interest) Dipubabu will get at the end of the year.

Answer

P = Rs. 15000, r = 5, t = $\frac{1}{4}$ yr and I = ?

Since, $I = \frac{p \times r \times t}{100}$

$$\Rightarrow I = \frac{15000 \times 5 \times 1}{400}$$

$$\Rightarrow I = \frac{150 \times 5}{4} = \text{Rs. } 187.5$$

Amount = Principal + Interest

Amount = 15000 + 187.5 = Rs. 15187.5

But, after 3 months Dipubabu withdraws Rs. 3000

So, remain amount in the bank = 15187.5 – 3000 = Rs. 12187.5

P = Rs. 12187.5, r = 5, t = $\frac{1}{4}$ yr and I = ?

Since, $I = \frac{p \times r \times t}{100}$

$$\Rightarrow I = \frac{12187.5 \times 5 \times 1}{4 \times 100}$$

⇒ I = Rs. 152.34

Amount = Principal + Interest

Amount = 12187.5 + 152.34 = Rs. 12339.84

But, after 3 months Dipababu deposits Rs. Rs. 8000

So, amount become in bank = 12339.84 + 8000 = Rs. 20339.84

P = Rs. 20339.84, r = 5, t = $\frac{1}{2}$ and I = ?

Since, $I = \frac{p \times r \times t}{100}$

$\Rightarrow I = \frac{20339.84 \times 5 \times 1}{100 \times 2}$

⇒ I = Rs. 508.496

Amount (Principal along with Interest) = Principal + Interest

⇒ Amount = 20339.84 + 508.496 = Rs. 20848.336

Hence, He will get Rs. 20848.336 in the end of year.

19. Question

Rahamatchacha takes a loan amount of ₹2,40,000 from a bank for constructing a building at the rate of simple interest of 12% per annum. After 1 yr. Of taking the loan he rents the house at the rate of ₹5200 per month. Let us determine the number of yrs. he would take to repay his loan along with interest from the income of the houserent.

Answer

After 1 yr loan becomes

P = Rs. 240000, r = 12, t = 1 and I = ?

Since, $I = \frac{p \times r \times t}{100}$

$\Rightarrow I = \frac{240000 \times 12 \times 1}{100}$

⇒ I = Rs. 28,800

Thus, amount becomes after n yr is

Amount = Principal + n× Intertest

⇒ Amount = 240000 + n× 28800 = Rs. (240000 + 28800n)

He rents the house at the rate of Rs. 5200 per month

n years = 12×n months

The earns rent = 5200×12×n = 62400×n

⇒ 62400n = (240000 + 28800n)

⇒ (62400 - 28800)n = 240000

$\Rightarrow n = \frac{240000}{33600} = \frac{50}{7}\ yr$

Hence, he will take $\frac{50}{7}$ years for to repay his loan along with interest.

20. Question

Rothinbabu deposits the money for each of his two daughters in such a way that when the ages of each of his daughters will be 18yrs. each one will get ₹1,20,000. The rate of simple interest per annum in the bank is 10% and the present ages of his daughters are 13yrs. and 8 yrs. respectively. Let us determine the money, he had deposited separately inthe bank for each of his daughters.

Answer

Let's money deposited by Rothinbabu for his daughters are 'p' and 'P' respectively.

For a girl of 13 years:

P = p, r = 10, t = 5 and I = ?

Since, $I = \frac{p \times r \times t}{100}$

$\Rightarrow I = \frac{p \times 10 \times 5}{100}$

$\Rightarrow$ Amount = $p + \frac{50p}{100}$

$\Rightarrow 120000 = p(\frac{1}{2} + 1)$

$\Rightarrow p = \frac{120000 \times 2}{3}$

$\Rightarrow$ p = Rs. 80000

For a girl of 8 years:

P = P, r = 10, t = 10 and I = ?

Since, $I = \frac{p \times r \times t}{100}$

$\Rightarrow I = \frac{P \times 10 \times 10}{100}$

$\Rightarrow$ Amount = p + p = 2p

$\Rightarrow$ 120000 = 2p

$\Rightarrow P = \frac{120000}{2} = Rs.\ 60000$

Hence, money deposited by the main for his daughters are Rs. 80000 and Rs. 60000 respectively.

21 A1. Question

If the interest of ₹p at the rate of simple interest of r% per annum in t years is I,then

A. I = Prt

B. PrtI = 100

C. Prt = 100 x I

D. None of these

Answer

As we know,

$$\text{I(Interest)} = \frac{p \times r \times t}{100}$$

Using cross-multiplication we get,

$\Rightarrow 100 \times I = prt$Hence option C is right.

21 A2. Question

A principal becomes twice of its amount in 20 yrs at a certain rate of simpleinterest. At the same rate of simple interest, that principal becomes thrice of its amount in

A. 30yrs.

B. 35yrs.

C. 40yrs.

D. 45yrs.

Answer

Amount = 2p, Principal = p, r = r, t = 20 yr

Interest = Amount – Principal = 2p – p = p

Since, $I = \frac{p \times r \times t}{100}$

$$\Rightarrow p = \frac{p \times r \times 20}{100}$$

$$\Rightarrow r = 5$$

Amount = 3p, Principal = p

⇒ Interest = 3p – p = 2p

P = p , r = 5 , t = ? and I = 2p

Since, $I = \frac{p \times r \times t}{100}$

$\Rightarrow 2p = \frac{p \times 5 \times t}{100}$

$\Rightarrow t = 40$ yr

Hence, (C) is correct option.

21 A3. Question

If a principal becomes twice of its amount in 10 yrs, the rate of simple interest per annum is

A. 5%

B. 10%

C. 15%

D. 20%

Answer

Amount = 2p, Principal = p, Interest = ?

Interest = 2p – p = p

P = p, r = ?, t = 10 and I = p

Since, $I = \frac{p \times r \times t}{100}$

$\Rightarrow p = \frac{p \times r \times 10}{100}$

⇒ r = 10 %

21 A4. Question

If the total interest becomes ₹ x for any principal having the rate of simple interest of x% per annum for x years then the principal will be

A. ₹ x

B. ₹100x

C. ₹$\frac{100}{x}$

D. $\frac{100}{x^2}$

Answer

Let's Principle is Rs. 'p'

P = p, r = x, t = x and I = x

Since, $I(\text{Interest}) = \frac{p \times r \times t}{100}$

$\Rightarrow x = \frac{p \times x \times x}{100}$

$\Rightarrow p = \frac{100}{x}$

P = Rs. $\frac{100}{x}$

21 A5. Question

The total interest of a principal in n yrs. at the rate of simple interest of r% per annum in $\frac{pnr}{25}$, the principal will be

A. ₹2p

B. ₹4p

C. ₹$\frac{p}{2}$

D. ₹$\frac{p}{4}$

Answer

Let's Principal is 'P'

P = P, r = r , t = n and I = $\frac{pnr}{25}$

Since, $I = \frac{P \times r \times t}{100}$

$\Rightarrow \frac{pnr}{25} = \frac{P \times r \times n}{100}$

⇒ P = 4p

Hence, (B) is correct option.

21 B. Question

Let us write, whether the following statements are true or false:

(i) A man takes a loan is called debtor

(ii) If the principal and the rate of simple interest in percent per annum be constants, then the total interest and the time are inverse relation.

Answer

(i) True

NOTE: The person or organization who gives money as loan, is called creditor and the person or organization who takes money as loan is called 'debtor'.

(ii) False

Since, $I = \frac{p \times r \times t}{100}$

If Principal and rate are constant then

Interest will be directly proportional to time.

21 C. Question

Let us fill in the blanks:

(i) A man who gives a loan is called_____.

(ii) The amount of ₹2p in t yrs. at the rate of simple interest of $\frac{r}{2}$% per annum is ₹(2p + _____).

(iii) The ratio of the principal and the amount (principal along with interest) in 1 yr. is8:9, the rate of simple interest per annum is _____.

Answer

(i) Creditor.

(ii)

$\frac{prt}{100}$

P = 2p, r = $\frac{r}{2}$, t = t and I = ?

Since, $I = \frac{p \times r \times t}{100}$

$$\Rightarrow I = \frac{2p \times r \times t}{100 \times 2}$$

$$I = \frac{prt}{100}$$

Hence, Amount = $2p + \frac{prt}{100}$

(iii) 12.5%

$$\frac{P}{A} = \frac{8}{9}$$

$$\Rightarrow A = \frac{9}{8}P$$

Since, Interest = Amount – Principal

$\Rightarrow I = \frac{9}{8}p - p = \frac{1}{8}p$

As we know,

$$I = \frac{p \times r \times t}{100}$$

$$\frac{p}{8} = \frac{pr}{100}$$

$\Rightarrow r = 12.5\%$

22 A. Question

Let us write the number of yrs. for which a principal becomes twice of its amount having the rate of simple interest of $6\frac{1}{4}\%$ per annum.

Answer

Let's assume Principal is 'P'

Interest = Amount – Principal

Interest = 2P – P = P

P = P, r = $\frac{25}{4}$, t = ? and I = P

Since, $I = \frac{p \times r \times t}{100}$

$$\Rightarrow P = \frac{P \times 25 \times t}{100 \times 4}$$

⇒ t = 8 years

Hence, the number of years is 8.

22 B. Question

The rate of simple interest per annum reduces 4% to $3\frac{3}{4}$% and for this,

Amalbabu's annual income decreases by ₹60. Let us determine Amal babu's principal.

Answer

Let's assume Amal babu 's Principal was 'p'

When the rate of simple interest was 4%

P = 'P', r = 4, t = 1 and I = ?

Since, $I = \frac{p \times r \times t}{100}$

$\Rightarrow I = \frac{P \times 4 \times 1}{100}$

$\Rightarrow I = \frac{4P}{100}$

When the rate of simple rate is $\frac{15}{4}$ %

Using $I = \frac{p \times r \times t}{100}$

$\Rightarrow I = \frac{P \times 15 \times 1}{100 \times 4}$

$\Rightarrow I = \frac{15P}{400}$

According to question,

Annual income of Amal babu decreases by Rs. 60

$\Rightarrow \frac{4P}{100} - \frac{15P}{400} = \frac{16P - 15P}{400}$

$\Rightarrow \frac{P}{400} = 60$

⇒ P = Rs. 24000

Hence, Amal babu Principal was Rs. 24000

22 C. Question

What is the rate of simple interest per annum, when the interest of some money in 4 yrs. will be $\frac{8}{25}$ part of its principal-le us determine it.

Answer

Say, rate of simple interest per annum is 'r'

Interest in 4 years will be = $\frac{8}{25}$ of it's principal

Let's say Principal be 'P'

⇒ Interest = $\frac{8}{25}$P

P = P, r = r, t = 4 and I = $\frac{8}{25}$P

As we know,

$$I = \frac{p \times r \times t}{100}$$

$$\Rightarrow \frac{8}{25}P = \frac{P \times r \times 4}{100}$$

⇒ r = 8%

Hence, rate of simple interest will be 8%.

22 D. Question

What is the rate of simple interest per annum, when the interest of some money in 10yrs. will be $\frac{2}{5}$ part of its amount (principal along with interest)- Let us determine it.

Answer

Say rate of simple interest per annum is 'r'

Given: Interest of some money will be $\frac{2}{5}$ Part of it's amount

Let's Principal be 'P'

⇒ Interest = $\frac{2}{5}$P

P = P, r = r, t = 10 years and I = $\frac{2}{5}$P

Since, $I = \frac{p \times r \times t}{100}$

$$\Rightarrow \frac{2}{5}P = \frac{P \times r \times 10}{100}$$

$$\Rightarrow r = \frac{100}{25}$$

$\Rightarrow r = 4\%$

22 E. Question

Let us determine the money for which monthly interest is ₹1 having the rate of simple interest of 5% per annum.

Answer

Let's assume The Principal is Rs. 'P'

P = P, r = 5, t = $\frac{1}{12}$ year and I = Rs. 1

As we know,

$$I = \frac{P \times r \times t}{100}$$

$$\Rightarrow 1 = \frac{P \times 5 \times 1}{12 \times 100}$$

$$\Rightarrow P = \frac{12 \times 100}{5}$$

$\Rightarrow P$ = Rs. 240