

Exercise 2(B)

Solution:

Given,

Installment per month (P) = Rs 600

Number of months (n) = 48

Rate of interest (r) = 8% p.a.

So,

$$\begin{aligned} \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 600 \times \frac{48(48+1)}{2 \times 12} \times \frac{8}{100} \\ &= 600 \times \frac{2352}{24} \times \frac{8}{100} \end{aligned}$$

S.I = Rs 4,704

Hence,

The amount that Pramod will be getting at the time of maturity is

= Rs (600 × 48) + Rs 4,704

= Rs 28,800 + Rs 4,704

= Rs 33,504

Solution:

Given,

Installment per month (P) = Rs 80

Number of months (n) = 18

Let rate of interest (r) = r % p.a.

$$\begin{aligned} \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 80 \times \frac{18(18+1)}{2 \times 12} \times \frac{r}{100} \\ &= 80 \times \frac{342}{24} \times \frac{r}{100} \end{aligned}$$

S.I = 11.4r

Hence, the amount at the time of maturity will be = Rs (80 × 18) + Rs (11.4r)

And given maturity value = Rs 1,554

So, on equating

Rs (80 × 18) + Rs (11.4r) = Rs 1,554

11.4r = Rs 1,554 – Rs 1,440

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$$r = 114 / 11.4 = 10 \%$$

Therefore, the rate of interest paid by the bank is 10 %

Solution:

Given,

Installment per month (P) = Rs 400

Let the time, number of months (n) = n

Rate of interest (r) = 8 % p.a.

$$\begin{aligned} \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 400 \times \frac{n(n+1)}{2 \times 12} \times \frac{8}{100} \\ &= 400 \times \frac{n(n+1)}{24} \times \frac{8}{100} \\ &= \text{Rs } \frac{4n(n+1)}{3} \end{aligned}$$

So, at the time of maturity the value will be = Rs (400 x n) + Rs $\frac{4n(n+1)}{3}$

And, given maturity value = Rs 16,176

So, on equating

$$\text{Rs } (400 \times n) + \frac{4n(n+1)}{3} = \text{Rs } 16,176$$

$$1200n + 4n^2 + 4n = \text{Rs } 48,528$$

$$4n^2 + 1204n = \text{Rs } 48,528$$

$$n^2 + 301n - 12132 = 0$$

$$(n + 337)(n - 36) = 0$$

$n = -337$ (not considered as time cannot be negative) or $n = 36$

Therefore, the number of months (time) = 36 months = 3 years

Solution:

Let's assume the installment per month to be Rs P

Number of months (n) = 24

Rate of interest = 8% p.a.

So,

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$$\begin{aligned} \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= P \times \frac{24(24+1)}{2 \times 12} \times \frac{8}{100} \\ &= P \times \frac{600}{24} \times \frac{8}{100} \end{aligned}$$

$$\text{S.I} = \text{Rs } 2P$$

Thus,

The amount at maturity will be = Rs (P x 24) + Rs 2P = Rs 26P

And, given maturity value = Rs30,000

So, on equating

$$\text{Rs } 26P = \text{Rs } 30,000$$

$$P = 30,000 / 26$$

$$P = \text{Rs } 1,153.84 = \text{Rs } 1,155(\text{multiple of } 5)$$

1. Mr. Richard has a recurring deposit account in a post office for 3 years at 7.5 % p.a. simple interest. If he gets Rs. 8,325 as interest at the time of maturity, find:

(i) the monthly instalment

(ii) the amount of maturity

Solution:

Let's assume the monthly installment be Rs P

Interest over the period = Rs. 8,325

Rate of interest = 7.5%

Time = 3 years = 36 months

(i)

$$\begin{aligned} \text{Interest} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ \Rightarrow 8325 &= P \times \frac{36(36+1)}{2 \times 12} \times \frac{7.5}{100} \\ \Rightarrow P &= \text{Rs. } 2,000 \end{aligned}$$

Therefore, the monthly installment is Rs 2,000

(ii)

$$\begin{aligned} \text{Maturity value} &= \text{total sum deposited} + \text{interest} \\ &= 2000 \times 36 + 8325 \\ &= 72000 + 8325 \\ &= \text{Rs } 80,325 \end{aligned}$$

Therefore, the amount of maturity is Rs 80,325