



## Exercise 11B

Q10.

Answer :

Principal amount,  $P = \text{Rs. } 18000$

Rate of interest for the first year,  $p = 12\% \text{ p.a.}$

Rate of interest for the second year,  $q = 12\frac{1}{2}\% \text{ p.a.}$

Time,  $n = 2 \text{ years}$

The formula for *the* amount including the compound interest for the first year is *given below* :

$$\begin{aligned}
 A &= \left\{ P \times \left( 1 + \frac{p}{100} \right) \times \left( 1 + \frac{q}{100} \right) \right\} \\
 &= \text{Rs. } \left\{ 18000 \times \left( 1 + \frac{12}{100} \right) \times \left( 1 + \frac{25}{100 \times 2} \right) \right\} \\
 &= \text{Rs. } \left\{ 18000 \times \left( \frac{100+12}{100} \right) \times \left( 1 + \frac{25}{200} \right) \right\} \\
 &= \text{Rs. } \left\{ 18000 \times \left( \frac{100+12}{100} \right) \times \left( 1 + \frac{1}{8} \right) \right\} \\
 &= \text{Rs. } \left\{ 18000 \times \left( \frac{100+12}{100} \right) \times \left( \frac{8+1}{8} \right) \right\} \\
 &= \text{Rs. } \left\{ 18000 \times \left( \frac{112}{100} \right) \times \left( \frac{9}{8} \right) \right\} \\
 &= \text{Rs. } \{ 18000 \times (1.12) \times (1.125) \} \\
 &= \text{Rs. } 22680
 \end{aligned}$$

$\therefore$  Shubhalaxmi has to pay Rs 22680 to the finance company after 2 years.

Q11.

Answer :

Principal amount,  $P = \text{Rs. } 24000$

Rate of interest,  $R = 10\% \text{ p.a.}$

Time,  $n = 2 \text{ years } 3 \text{ months} = 2\frac{1}{4} \text{ years}$

The formula for the amount including the compound interest is *given below* :

$$\begin{aligned}
 A &= P \times \left( 1 + \frac{R}{100} \right)^n \times \left( 1 + \frac{\frac{1}{4}R}{100} \right) \\
 &= \text{Rs. } 24000 \times \left( 1 + \frac{10}{100} \right)^2 \times \left( 1 + \frac{\frac{1}{4} \times 10}{100} \right) \\
 &= \text{Rs. } 24000 \times \left( \frac{100+10}{100} \right)^2 \times \left( \frac{100+2.5}{100} \right) \\
 &= \text{Rs. } 24000 \times \left( \frac{110}{100} \right)^2 \times \left( \frac{100+2.5}{100} \right) \\
 &= \text{Rs. } 24000 \times (1.1 \times 1.1 \times 1.025) \\
 &= \text{Rs. } 24000 \times (1.250) \\
 &= \text{Rs. } 29766
 \end{aligned}$$

Therefore, Neha should pay Rs 29766 to the bank after 2 years 3 months.

Q12.

Answer :

Principal amount,  $P = \text{Rs } 16000$

Rate of interest,  $R = \frac{15}{2} \% \text{ p.a.}$

Time,  $n = 2 \text{ years}$

Now, simple interest  $= \text{Rs } \left( \frac{16000 \times 2 \times 15}{100 \times 2} \right) = \text{Rs. } 2400$

Amount including the simple interest  $= \text{Rs } (16000 + 2400) = \text{Rs } 18400$

The formula for the amount including the compound interest is given below :

$$\begin{aligned} A &= P \left( 1 + \frac{R}{100} \right)^n \\ &= \text{Rs. } 16000 \left( 1 + \frac{15}{100 \times 2} \right)^2 \\ &= \text{Rs. } 16000 \left( 1 + \frac{15}{200} \right)^2 \\ &= \text{Rs. } 16000 \left( 1 + \frac{3}{40} \right)^2 \\ &= \text{Rs. } 16000 \left( \frac{40+3}{40} \right)^2 \\ &= \text{Rs. } 16000 \left( \frac{43}{40} \right)^2 \\ &= \text{Rs. } 16000 (1.075 \times 1.075) \end{aligned}$$

i.e., the amount including the compound interest is Rs 18490.

Now,  $(\text{CI} - \text{SI}) = \text{Rs. } (18490 - 18400) = \text{Rs. } 90$

Therefore, Abhay gains Rs. 90 as profit at the end of 2 years.

Q13.

Answer :

Simple interest  $(\text{SI}) = \text{Rs. } 2400$

Rate of interest,  $R = 8\%$

Time,  $n = 2 \text{ years}$

The principal can be calculated using the formula :

$$\begin{aligned} \text{Sum} &= \left( \frac{100 \times \text{SI}}{R \times T} \right) \\ \Rightarrow \text{Sum} &= \text{Rs. } \left( \frac{100 \times 2400}{8 \times 2} \right) = \text{Rs. } 15000 \end{aligned}$$

i.e., the principal is Rs. 15000.

The amount including the compound interest is calculated using the formula given below :

$$\begin{aligned} A &= P \left( 1 + \frac{R}{100} \right)^n \\ &= \text{Rs. } 15000 \left( 1 + \frac{8}{100} \right)^2 \\ &= \text{Rs. } 15000 \left( \frac{100+8}{100} \right)^2 \\ &= \text{Rs. } 15000 \left( \frac{108}{100} \right)^2 \\ &= \text{Rs. } 15000 (1.08 \times 1.08) \\ &= \text{Rs. } 17496 \end{aligned}$$

i.e., the amount including the compound interest is Rs. 17496.

$\therefore$  Compound interest  $(\text{CI}) = \text{Rs. } (17496 - 15000) = \text{Rs. } 2496$

Q14.

Answer :

Let Rs  $P$  be the sum.

$$\text{Then SI} = \left( \frac{P \times 2 \times 6}{100} \right) = \text{Rs. } \frac{12P}{100} = \text{Rs. } \frac{3P}{25}$$

$$\text{Also, CI} = \left\{ P \times \left( 1 + \frac{6}{100} \right)^2 - P \right\}$$

$$= \text{Rs. } \left\{ P \times \left( \frac{100+6}{100} \right)^2 - P \right\}$$

$$= \text{Rs. } \left\{ P \times \left( \frac{53}{50} \right)^2 - P \right\}$$

$$= \text{Rs. } \left\{ \left( \frac{2809P}{2500} \right) - P \right\}$$

$$= \text{Rs. } \left( \frac{2809P - 2500P}{2500} \right) = \text{Rs. } \frac{309P}{2500}$$

$$= \text{Rs. } \left\{ \frac{\text{Rs. } 25000}{2500} \right\} = \text{Rs. } \frac{25000}{2500}$$

$$\text{Now, (CI - SI) = Rs. } \left( \frac{309P}{2500} - \frac{3P}{25} \right)$$

$$= \text{Rs. } \left( \frac{309P - 300P}{2500} \right)$$

$$= \text{Rs. } \frac{9P}{2500}$$

$$\text{Now, Rs. } 90 = \frac{9P}{2500}$$

$$\Rightarrow P = \left( \frac{90 \times 2500}{9} \right) = \text{Rs. } 25000$$

Hence, the *required* sum is Rs. 25000.

Q15.

Answer :

Let  $P$  be the sum.

$$\text{Then SI} = \text{Rs. } \left( \frac{P \times 3 \times 10}{100} \right) = \text{Rs. } \frac{30P}{100} = \text{Rs. } \frac{3P}{10}$$

$$\text{Also, CI} = \text{Rs. } \left\{ P \times \left( 1 + \frac{10}{100} \right)^3 - P \right\}$$

$$= \text{Rs. } \left\{ P \times \left( \frac{100+10}{100} \right)^3 - P \right\}$$

$$= \text{Rs. } \left\{ P \times \left( \frac{11}{10} \right)^3 - P \right\}$$

$$= \text{Rs. } \left\{ \left( \frac{1331P}{1000} \right) - P \right\}$$

$$= \text{Rs. } \left\{ \frac{1331P - 1000P}{1000} \right\}$$

$$= \text{Rs. } \frac{331P}{1000}$$

$$\text{Now, (CI - SI) = Rs. } \left( \frac{331P}{1000} - \frac{3P}{10} \right)$$

$$= \text{Rs. } \left( \frac{331P - 300P}{1000} \right)$$

$$= \text{Rs. } \frac{31P}{1000}$$

$$\text{Now, Rs. } 93 = \frac{31P}{1000}$$

$$\Rightarrow P = \left( \frac{93 \times 1000}{31} \right) = \text{Rs. } 3000$$

Hence, the *required* sum is Rs. 3000.

\*\*\*\*\* END \*\*\*\*\*