



### Exercise 11B

Q1.

Answer :

Principal amount,  $P = \text{Rs } 6000$

Rate of interest,  $R = 9\%$  per annum

Time,  $n = 2$  years.

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

$$A = \text{Rs. } P \left( 1 + \frac{R}{100} \right)^n$$

$$\Rightarrow A = \text{Rs. } 6000 \left( 1 + \frac{9}{100} \right)^2$$

$$\Rightarrow A = \text{Rs. } 6000 \left( \frac{100+9}{100} \right)^2$$

$$\Rightarrow A = \text{Rs. } 6000 \left( \frac{109}{100} \right)^2$$

$$\Rightarrow A = \text{Rs. } 6000 (1.09 \times 1.09)^2$$

$$\Rightarrow A = \text{Rs. } 7128.6$$

i.e., the amount including the compound interest is Rs 7128.6.

$\therefore$  Compound interest = Rs  $(7128.6 - 6000) = \text{Rs } 1128.6$

Q2.

Answer :

Principal amount,  $P = \text{Rs. } 10000$

Rate of interest,  $R = 11\%$  per annum.

Time,  $n = 2$  years.

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

$$A = \text{Rs. } P \left( 1 + \frac{R}{100} \right)^n$$

$$\Rightarrow A = \text{Rs. } 10000 \left( 1 + \frac{11}{100} \right)^2$$

$$\Rightarrow A = \text{Rs. } 10000 \left( \frac{100+11}{100} \right)^2$$

$$\Rightarrow A = \text{Rs. } 10000 \left( \frac{111}{100} \right)^2$$

$$\Rightarrow A = \text{Rs. } 10000 (1.11 \times 1.11)^2$$

$$\Rightarrow A = \text{Rs. } 12321$$

i.e., the amount including the compound interest is Rs 12321.

$\therefore$  Compound interest = Rs.  $(12321 - 10000) = \text{Rs. } 2321$

Q3.

Answer :

Principal amount,  $P = \text{Rs. } 31250$

Rate of interest,  $R = 8\%$  per annum.

Time,  $n = 3$  years.

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

$$A = \text{Rs. } P \left( 1 + \frac{R}{100} \right)^n$$

$$\Rightarrow A = \text{Rs. } 31250 \left( 1 + \frac{8}{100} \right)^3$$

$$\Rightarrow A = \text{Rs. } 31250 \left( \frac{100+8}{100} \right)^3$$

$$\Rightarrow A = \text{Rs. } 31250 \left( \frac{108}{100} \right)^3$$

$$\Rightarrow A = \text{Rs. } 31250 (1.08 \times 1.08 \times 1.08)^3$$

$$\Rightarrow A = \text{Rs. } 39366$$

i.e., the amount including the compound interest is Rs 39366.

$$\therefore \text{Compound interest} = \text{Rs. } (39366 - 31250) = \text{Rs. } 8116$$

Q4.

Answer :

Principal amount,  $P = \text{Rs. } 10240$

Rate of interest,  $R = 12 \frac{1}{2} \% \text{ p.a.}$

Time,  $n = 3 \text{ years}$

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

$$A = \text{Rs. } P \left( 1 + \frac{R}{100} \right)^n$$

$$\Rightarrow A = \text{Rs. } 10240 \left( 1 + \frac{25}{100 \times 2} \right)^3$$

$$\Rightarrow A = \text{Rs. } 10240 \left( 1 + \frac{25}{200} \right)^3$$

$$\Rightarrow A = \text{Rs. } 10240 \left( 1 + \frac{1}{8} \right)^3$$

$$\Rightarrow A = \text{Rs. } 10240 \left( \frac{8+1}{8} \right)^3$$

$$\Rightarrow A = \text{Rs. } 10240 \left( \frac{9}{8} \right)^3$$

$$\Rightarrow A = \text{Rs. } 10240 (1.125 \times 1.125 \times 1.125)^3$$

$$\Rightarrow A = \text{Rs. } 14580$$

i.e., the amount including the compound interest is Rs 14580.

$$\therefore \text{Compound interest} = \text{Rs } (14580 - 10240) = \text{Rs. } 4340$$

Q5.

Answer :

Principal amount,  $P = \text{Rs } 62500$

Rate of interest,  $R = 12\% \text{ p.a.}$

Time,  $n = 2 \text{ years } 6 \text{ months} = \frac{5}{2} = 2 \frac{1}{2} \text{ years}$

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

$$A = \text{Rs. } P \left( 1 + \frac{R}{100} \right)^n$$

$$\Rightarrow A = \text{Rs. } 62500 \left(1 + \frac{12}{100}\right)^2 \times \left(1 + \frac{\frac{1}{2} \times 12}{100}\right)$$

$$\Rightarrow A = \text{Rs. } 62500 \left(1 + \frac{12}{100}\right)^2 \times \left(1 + \frac{6}{100}\right)$$

$$\Rightarrow A = \text{Rs. } 62500 \times 1.12 \times 1.12 \times 1.06$$

$$\Rightarrow A = \text{Rs. } 83104$$

i.e., the amount including the compound interest is Rs 83104.

$$\therefore \text{Compound interest} = \text{Rs. } (83104 - 62500) = \text{Rs. } 20604$$

Q6

Answer :

Principal amount,  $P = \text{Rs. } 9000$

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

Time,  $n = 2 \text{ years } 4 \text{ months} = 2 \frac{1}{3} \text{ years} = \frac{7}{3} \text{ years}$

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

$$A = \text{Rs. } P \times \left(1 + \frac{R}{100}\right)^n$$

$$= \text{Rs. } \left(9000 \times \left(1 + \frac{10}{100}\right)^2 \times \left(1 + \frac{\frac{1}{3} \times 10}{100}\right)\right)$$

$$= \text{Rs. } (9000 \times 1.10 \times 1.10 \times 1.033)$$

$$= \text{Rs. } 11252.9 \approx 11253$$

i.e., the amount including the compound interest is Rs 11253.

$$\therefore \text{Compound interest} = \text{Rs. } (11253 - 9000) = \text{Rs. } 2253$$

Q7.

Answer :

Principal amount,  $P = \text{Rs. } 8000$

Rate of interest for the first year,  $p = 9\% \text{ p.a.}$

Rate of interest for the second year,  $q = 10\% \text{ p.a.}$

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

Formula for the amount including the compound interest for the first year :

$$A = \text{Rs. } \left\{P \times \left(1 + \frac{p}{100}\right) \times \left(1 + \frac{q}{100}\right)\right\}$$

$$= \text{Rs. } \left\{8000 \times \left(1 + \frac{9}{100}\right) \times \left(1 + \frac{10}{100}\right)\right\}$$

$$= \text{Rs. } \left\{8000 \times \left(\frac{109}{100}\right) \times \left(\frac{110}{100}\right)\right\}$$

$$= \text{Rs. } \{8000 \times (1.09) \times (1.1)\}$$

$$= \text{Rs. } 9592$$

i.e., the amount including the compound interest for first year is Rs 9592.

Q8.

Answer :

Principal amount,  $P = \text{Rs. } 125000$

Rate of interest,  $R = 8\% \text{ p. a.}$

Time,  $n = 3 \text{ year } s$

The amount including the compound interest is calculated using the formula,

$$\begin{aligned} A &= \text{Rs. } P \left(1 + \frac{R}{100}\right)^n \\ &= \text{Rs. } 125000 \left(1 + \frac{8}{100}\right)^3 \\ &= \text{Rs. } 125000 \left(\frac{100+8}{100}\right)^3 \\ &= \text{Rs. } 125000 \left(\frac{108}{100}\right)^3 \\ &= \text{Rs. } 125000 (1.08)^3 \\ &= \text{Rs. } 125000 (1.08 \times 1.08 \times 1.08) \\ &= \text{Rs. } 157464 \end{aligned}$$

$\therefore$  Anand has to pay Rs 157464 after 3 years to clear the debt.

Q9.

Answer :

Principal amount,  $P = \text{Rs. } 11000$

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

Time,  $n = 3 \text{ years}$

The amount including the compound interest is calculated using the formula,

$$\begin{aligned} A &= \text{Rs. } P \left(1 + \frac{R}{100}\right)^n \\ &= \text{Rs. } 11000 \left(1 + \frac{10}{100}\right)^3 \\ &= \text{Rs. } 11000 \left(\frac{100+10}{100}\right)^3 \\ &= \text{Rs. } 11000 \left(\frac{110}{100}\right)^3 \\ &= \text{Rs. } 11000 (1.1)^3 \\ &= \text{Rs. } 11000 (1.1 \times 1.1 \times 1.1) \\ &= \text{Rs. } 14641 \end{aligned}$$

Therefore, Beeru has to pay Rs 14641 to clear the debt.

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