Exercise 11B

Q1.

Answer :

Principal amount, P = 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 = Rs. $P\left(1+\frac{R}{100}\right)^{n}$

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

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

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

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

$\Rightarrow A$ = Rs. 7128.6

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

$\therefore$ Compound interest = Rs (7128.6 − 6000) = Rs 1128.6

Q2.

Answer :

Principal amount, P = 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 = Rs. $P\left(1+\frac{R}{100}\right)^{n}$

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

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

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

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

$\Rightarrow A$ = Rs. 12321

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

$\therefore$ Compound interest = Rs. (12321 − 10000) = Rs. 2321

Q3.

Answer :

Principal amount, P = 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 = Rs. $P\left(1+\frac{R}{100}\right)^{n}$

$\Rightarrow A$ = 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.

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

Q4.

Answer :

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

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

Time, $n = 3$ years

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

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

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

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

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

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

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

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

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

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

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

Q5.

Answer :

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

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

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

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

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

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

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

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

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

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

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

Q6

Answer :

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

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

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

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

Q7.

Answer :

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

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

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

Time, $n = 2$ 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, $R = 8\%$ p. a.
Time, $n = 3$ years
The amount including the compound interest is calculated using the formula,

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

$= \text{Rs. } 125000\left(1 + \frac{8}{100}\right)^3$

$= \text{Rs. } 125000\left(\frac{100+8}{100}\right)^3$

$= \text{Rs. } 125000\left(\frac{108}{100}\right)^3$

$= \text{Rs. } 125000\,(1.08)^3$

$= \text{Rs. } 125000\,(1.08 \times 1.08 \times 1.08)$

$= \text{Rs. } 157464$

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

Q9.

Answer :

Principal amount, $P = \text{Rs. } 11000$
Rate of interest, $R = 10\%$ p. a.
Time, $n = 3$ years
The amount including the compound interest is calculated using the formula,

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

$= \text{Rs. } 11000\left(1 + \frac{10}{100}\right)^3$

$= \text{Rs. } 11000\left(\frac{100+10}{100}\right)^3$

$= \text{Rs. } 11000\left(\frac{110}{100}\right)^3$

$= \text{Rs. } 11000\,(1.1)^3$

$= \text{Rs. } 11000\,(1.1 \times 1.1 \times 1.1)$

$= \text{Rs. } 14641$

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

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