

Compound Interest- instalment

CONCEPTS: CI- INSTALLMENT BASED PROBLEMS

Concept

$10\% = \frac{10}{100} = \frac{1}{10}$ EMI

$\sqrt{11^2 \times 10^1} \rightarrow 11 \times 11^1$ 1st year int
 $11 \times 10^2 \rightarrow 11 \times 11^2$ 2nd year int
 $10^3 \rightarrow 11^3$ 3rd year

$4\% = \frac{4}{100} = \frac{1}{25}$

$25^1 \rightarrow 26^1$
 $25^2 \rightarrow 26^2$
 $25^3 \rightarrow 26^3$

Trick

$10\% = \frac{10}{100} = \frac{1}{10}$

10 — 11 (1st year)
 10^2 — 11^2 (2nd year)

1×10 — 11×11
 100 — 121 installment

110 — 121
 100 — 121 installment

210 — 242
 Borrowed 32 Interest Money

CI- INSTALLEMENT BASED PROBLEMS

Q1. A sum of Rs. 2100 is to be paid back in 2 equal installments. How much is each installments if the interest is compounded annually at 10% per annum?

- a. Rs. 1210 b. Rs. 1240 c. Rs. 1230 d. Rs. 1220

$$\left[\frac{10 - 11}{10^2 - 11^2} \cdot \frac{11 \times 10 - 11 \times 11}{100 - 121} \right]$$

$$= \frac{2100 \times 121}{210}$$

$$= 1210$$

Amount borrowed

CI- INSTALLEMENT BASED PROBLEMS

Q2. A sum of Rs. 4,620 is to be paid back in 2 equal installments. How much is each installment (in Rs). If the interest rate is compounded annually at 10% per annum?

- a. Rs. 2,662 b. Rs. 2,420 c. Rs. 2,552 d. Rs. 2,750

$$\frac{22}{4620} \times 121$$

$$= 22 \times 121$$

$$= 2420$$

$$2420$$

$$2662$$

$$\left[\frac{11 \times 10 - 11 \times 11}{100 - 121} \right]$$

$$= \frac{210}{1}$$

CI- INSTALLEMENT BASED PROBLEMS

Q3. A man borrowed some money and returned it in two equal installments of Rs. 3,025 each. If the rate of interest is 10% per annum, compound annually, find the sum borrowed?

- a. Rs. 5,575 b. Rs. 6,250 c. Rs. 6,525 d. Rs. 5,250

$$\text{Installment} = 3025$$

$$\text{rate} = 10\%$$

$$\text{Sum} = ?$$

$$11 \times 10 - 11 \times 11$$

$$100 - 121$$

$$210$$

$$= \frac{3025 \times 210}{121}$$

$$= 5250$$

CI- INSTALLEMENT BASED PROBLEMS

Q4. Rahul takes a sum of Rs. 2310 as a loan. He has to repay this in two equal annual installments. If the rate of interest is 20% compounded annually, what percent of the principal amount taken by Rahul is the total interest paid by him.

1. 20% 2. 40.9% 3. 130.9% 4. 30.9%

$$20\% = \frac{20}{100} = \frac{1}{5}$$

$$6 \times 5 - 6 \times 6$$

$$25 - 36$$

$$55 - 72$$

$$17$$

$$30.9\%$$

$$714 \times 100$$

$$2310$$

$$23 \times 4 = 92$$

$$23 \times 3 = 69$$

$$\text{Interest} = 714$$

TCS question

CI- INSTALLEMENT BASED PROBLEMS

Q5. Loan is to be repaid in two equal yearly installments. If the rate of interest is 10% per annum, compounded annually, and each installment is Rs. 6,897, then find the total interest charged.

1. Rs. 1,644 2. Rs. 1,824 3. Rs. 1,914 4. Rs. 1,734

$$\text{Installment} = 6897$$

$$11 \times 10 - 11 \times 11$$

$$100 - 121$$

$$210$$

$$32$$

$$6897 \times 32$$

$$121$$

$$6897$$

$$114$$

$$171$$

$$1824$$

CI- INSTALLEMENT BASED PROBLEMS

Q6 Loan is to repaid in two equal yearly installments. If the rate of interest is 10% per annum, compounded annually, and each installment is Rs.6,534, then find the total interest charged.

1. Rs.1,728 2. Rs.1,867 3. Rs.1,642 4. Rs.1,579

$$\begin{array}{r} 594 \quad 54 \\ 6534 \times 32 \\ \hline 12111 \end{array}$$

$$\begin{array}{r} 54 \\ 32 \end{array}$$

$$\begin{array}{r} 11) 653459 \\ 55 \\ \hline 103 \\ 99 \\ \hline \end{array}$$

CI- INSTALLEMENT BASED PROBLEMS

Q7 A man borrowed money and paid back in two equal installments of Rs.1,089, at 10% compound interest compounded annually for 2 years. What was the sum(in Rs) borrowed?

1. Rs.1,890 2. Rs.2,178 3. Rs.1,800 4. Rs.2,090

$$\begin{array}{r} 99 \quad 9 \\ 1089 \times 20 \\ \hline 12111 \end{array}$$

$$\begin{array}{r} 1890 \end{array}$$

$$\begin{array}{r} 11 \times 10 - 11 \times 11 \\ 100 - 121 \\ \hline 210 \quad 242 \\ 32 \end{array}$$

CI- INSTALLEMENT BASED PROBLEMS

Q8 A man borrowed money and paid back in two equal installments of Rs.9,80, at 4% compound interest compounded annually for 2 years. What was the sum(in Rs) borrowed?

1. Rs.1,850 2. Rs.1,960 3. Rs.1,760 4. Rs.2,050

$$4\% = \frac{4}{100} = \frac{1}{25}$$

$$10^4 - 11^4$$

$$\begin{array}{l} \left[\begin{array}{l} 10^3 - 11^3 \\ \text{there is 2 more} \\ \text{calculate CI for 5} \\ \text{years} \end{array} \right] = \begin{array}{l} 25 - 26 \\ 25^2 - 26^2 \\ 25^3 - 26^3 \end{array} \times \begin{array}{l} 26 \times 25 - 26 \times 26 = 650 - 676 \\ 625 - 676 \\ 1275 \end{array} \\ \begin{array}{l} 13) 1275(98 \\ 117 \\ \hline 105 \end{array} \quad \begin{array}{l} 1275 \times 245 \\ 169 \end{array} \quad \begin{array}{l} 980 \times 1275 \\ 676 \\ 26 \times 26 \\ 2 \times 13 \times 2 \times 13 \end{array} \quad \begin{array}{l} \text{CI for 8 years} \\ 1275 \\ 245 \end{array} \end{array}$$

CI- INSTALLEMENT BASED PROBLEMS

Q9. A sum of Rs. X was borrowed and paid back in two equal yearly installements, each of Rs.35,280. If the rate of interest was 5%, compounded annually, then the value of x is.

1. Rs.64,400 2. Rs.65,600 3. Rs.64,800 4. Rs.65,400

$$5\% = \frac{1}{20}$$

$$20 - 21 \quad 20 \times 20 - 21 \times 21$$

$$20^2 - 21^2 \quad 400 - 441$$

$$\frac{80}{35,280} \times 820$$

$$\frac{441}{21 \times 21} = 65600$$

$$\frac{420}{400} - \frac{441}{400}$$

$$\frac{820}{820}$$

Sum = ?
Installement = 35,280
R = 5%

CI- INSTALLEMENT BASED PROBLEMS

Q10. Neeraj took Rs.6,800 as a loan which along with interest is to be repaid in two equal annual installments. If the rate of interest is $12\frac{1}{2}\%$ compounded annually, then the value of each of the installements is.

1. Rs.8,100 2. Rs.4,150 3. Rs.4,050 4. Rs.4,000

$$9 \times 8 \quad 9 \times 9$$

$$\frac{64}{136} \quad \frac{81}{162}$$

$$\frac{6800 \times 81}{136} \quad \frac{68 \times 100 \times 9 \times 9}{34 \times 4} = 50 \times 81$$

$$= 4050$$

Sum = 6,800
instalment
R = $\frac{25}{2}\%$
 $\frac{25}{2} \times \frac{1}{100} = \frac{1}{8}$

CI- INSTALLEMENT BASED PROBLEMS

Q11. A loan of Rs.8,925 is to be paid back in two equal half-yearly installements. How much is each instalment if the interest is compounded half-yearly at 8% per annum?

1. Rs.4,372 2. Rs.4,732 3. Rs.4,654 4. Rs.4,564

$$4\% = \frac{4}{100} = \frac{1}{25}$$

$$26 \times 25 - 26 \times 26$$

$$625 - 676$$

$$\frac{1275}{1275}$$

$$\frac{8925 \times 676}{1275}$$

$$= 4732$$

Sum = 8925
instalment
R = $\frac{8}{2} = 4\%$

CI- INSTALLEMENT BASED PROBLEMS

Q12. A sum of Rs.45,500 is to be paid back in 3 equal annual installments. How much is each installment if the interest is compounded annually at 20% per annum?

1. Rs.21,600 2. Rs.21,700 Rs.21,800 4. Rs.21,900

$$20\% = \frac{20}{100} = \left(\frac{1}{5}\right)$$

$$\text{Sum} = 45,500$$
$$\text{Installment (X)}$$

$$36 \times 5 = 6 \times 36$$
$$6 \times 25 = 36 \times 6$$
$$125 = 216$$

$$\frac{45,500 \times 216}{455} = 21600$$

$$180 - 216$$
$$150 - 216$$
$$125 - 216$$
$$455$$

$$30$$
$$15$$
$$15$$
$$216$$
$$216$$
$$216$$
$$305$$

CI- INSTALLEMENT BASED PROBLEMS

Q13. A sum of Rs.25,220 is to be paid back in 3 equal annual installments. How much is each installment if the interest is compounded annually at 5% per annum?

1. Rs.9361 2. Rs.9261 Rs.9621 4. Rs.9216