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QUESTIONS ON COMPOUND INTEREST AND SIMPLE INTEREST

Q1) Let the sum be ₹x.

Then $x, \left[\left(1+\frac{10}{100}\right)^2\right]^2 - 1 = 525.$

$\Rightarrow x\left[\left(\frac{11}{10}\right)^2\right] = 525$

$\Rightarrow x\left[\frac{121-100}{100}\right] = 525$

$\Rightarrow x = \frac{525 \times 100}{21} = 2500.$

For S.I, P = ₹2500, R = 5% pa and T = 4 years.

$S.I = \left(\frac{2500 \times 5 \times 4}{100}\right) = 500$

Q2) $S.I = \frac{PNR}{100}$

$N = 3, R = 8$

$\Rightarrow S.I = \frac{P \times 3 \times 8}{100}$ — ①

$\Rightarrow C.I = P\left[\left(1+\frac{r}{n}\right)^{nt} - 1\right]$

here $n = 1, t = 2, r = \frac{10}{100}, P = 4000$.

So, $C.I = 4000\left[\left(1+\frac{10}{100}\right)^2 - 1\right]$

$= 4000\,(1.21 - 1)$

$\Rightarrow C.I = 4000 \times 0.21$ — ②

but given $= S.I = \frac{1}{2} \times C.I$

$= \frac{P \times 3 \times 8}{100} = 4000 \times 0.21 \times \frac{1}{2}$

$P = \frac{4000 \times 0.21 \times 100}{3 \times 8} \times \frac{1}{2}$

$P = 2150$

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(23) If there is a 60% increase in an amount in 6 years at simple interest then,

$$SI = 60\% \cdot P$$

$$SI = \frac{60P}{100}$$

$$\text{Interest} = \frac{PTR}{100}$$

$$\Rightarrow \frac{60P}{100} = \frac{P \times 6 \times R}{100}$$

$$\Rightarrow \frac{60}{100} = \frac{6 \times R}{100}$$

$\therefore$ Rate of Interest = 10%.

$$\text{Compound Interest} = C.I = P\left(1 + \frac{R}{100}\right)^n - P$$

$$\Rightarrow C.I = 12000\left(1 + \frac{10}{100}\right)^3 - 12000$$

$$\Rightarrow C.I = 12000\left(\frac{11}{10}\right)^3 - 12000$$

$$\Rightarrow CI = 12000\left(\frac{1331}{1000}\right) - 1200.$$

$$\Rightarrow C.I = 15972 - 12000$$

$$= \underline{3972}$$

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Q4) $S.I = \frac{P \times r \times T}{100} = \frac{1500 \times r \times 2}{100} = 300r$

$C.I = 15000\left[\left(\frac{1+r}{100}\right)^2 - 1\right] = 15000\left[\frac{1+r^2}{10000} + \frac{2r}{100} - 1\right]$

$= 1.5r^2 + 300r.$

$C.I - S.I = 96.$

$= 1.5r^2 + 300r - 300r = 96$

$= 1.5r^2 = 96$

$= r^2 = \frac{96}{1.5} = 64$

$\therefore r = 8\%$