

SIMPLE INTEREST AND COMPOUND INTEREST.

Date: 05/10/23
Page: _____

$$01) P = ₹30000$$

$$R = 7\%$$

$$CI = ₹4347$$

Let the time be N years

$$\rightarrow 30000 \left[\frac{1+7}{100} \right]^n = \underline{24347}$$

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

$$02) P = ₹16000$$

$$R = 20\%$$

$$PA = \frac{20}{4} \% \text{ quarterly}$$

$$T = 9 \text{ months} = 3 \text{ Quarterly}$$

$$A = \left[\frac{1+R}{100} \right]^t = 16000 \left[\frac{1+5}{100} \right]^3 = 16000 \times \left[\frac{21}{20} \right]^3$$

$$= \frac{16000 \times 21 \times 21 \times 21}{20 \times 20 \times 20} = \underline{18522}$$

$$C.I = A - P = 18522 - 16000$$

$$= \underline{2522}$$

03) C.I when interest compounded yearly =

$$= \left[5000 \left(1 + \frac{4}{100} \right) \times \left(1 + \frac{1 \times 4}{2 \times 100} \right) \right]$$

$$= \underline{\underline{5304}}$$

C.I when interest compounded $\frac{1}{2}$ yearly

$$= 5000 \left[1 + \frac{2 \times 4}{100} \right]^3 = \underline{\underline{5306.04}}$$

$$\text{Difference} = (5306.04 - 5304) \\ = \underline{\underline{22.04}}$$

04) $R = 8\%$, $t = 2$, let the sum be P .

$$S.I = \frac{PRT}{100} = \frac{P \cdot 8 \times 2}{100} = \frac{4P}{25}$$

$$C.I = A - P$$

$$\Rightarrow P \left[1 + \frac{x}{100} \right]^t - P$$

$$\Rightarrow P \left[1 + \frac{x}{100} \right]^6 - P$$

$$\Rightarrow P \left[1 + \frac{8}{100} \right]^2 - 1 \Rightarrow P \left[\frac{21}{25} \right]^2 - 1 \Rightarrow P \left[\frac{129}{625} \right] = 1 \Rightarrow \frac{P \times 104}{625}$$

Q5) $R = 5\%$ p.a, $t = 3$ years, $SI = ₹12000$.
 $P = ₹ \left[\frac{100 \times 1200}{3 \times 5} \right] = ₹8000$

$A = 8000 \left[\frac{1+5}{100} \right]^3 = ₹9261$

$CI = ₹(9261 - 8000) = ₹1261$

Q6) SI on 7350 for 1 year.
 $= (8575 - 7350) = ₹1225$

$R = \left[\frac{100 \times 12.25 \times 1}{7350} \right] \% = 16\frac{2}{3}\%$

Let the sum be P,

$P \left[\frac{1+50 \times 100}{3} \right]^2 = 7350$

$P \times \frac{7}{6} \times \frac{7}{6} = 4350 \Rightarrow P \left[\frac{7350 \times 36}{49} \right] = ₹5400$

Q1) $R = 10\%$. $t = 2$ years

$$SI = \frac{PRT}{100} = \frac{P \times 10 \times 2}{100} = \frac{P}{5}$$

CI (HALF-YEARLY)

$$= P \left[1 + \frac{5}{100} \right]^4 - 1 = P \left[\frac{21}{20} \right]^4$$

$$\Rightarrow P \left[\frac{21}{20} \right]^4 - P - \frac{P}{5} = 124.05$$

$$\Rightarrow P \left[\left(\frac{21}{20} \right)^4 - 1 - \frac{1}{5} \right] = 124.05$$

$$\Rightarrow P \left[\frac{194481}{160000} - 1 - \frac{1}{5} \right] = 124.05$$

$$\Rightarrow P \left[\frac{194481 - 160000 - 32000}{160000} \right] = 124.05$$

$$\Rightarrow P = \frac{124.05 \times 160000}{2481} \Rightarrow P = \underline{\underline{£8000}}$$

Q8) Let the sum be x

$$C.I = \left[x \left(1 + \frac{10}{100} \right)^2 - x \right] = \frac{21x}{100}$$

$$S.I = \frac{x \times 10 \times 2}{100} \Rightarrow C.I - S.I = \frac{x}{100} \Rightarrow x = 631 \Rightarrow \underline{63100}$$

Q9) R% P.A. = $\left[18000 \left(1 + \frac{R}{100} \right)^2 - 18000 \right] - 1 - \left[\frac{2x}{100} \right] = 405$

$$\frac{9R^2}{5} = 405, R^2 = \left[\frac{405 \times 5}{9} \right] = 225, R = 15\%$$

Q10) Let the required number be n years

$$1331 = 1000 \left[1 + \frac{10}{100} \right]^n$$

$$\Rightarrow \frac{1331}{1000} = \left[\frac{10+1}{10} \right]^n \Rightarrow \left[\frac{11}{10} \right]^n = \left[\frac{10+1}{10} \right]^3, n = 3$$