Q1) $P = ₹30000$, $R = 7\%$, $CI = ₹4347$

Let the time be N years

$\Rightarrow 30000\left[1+\frac{7}{100}\right]^n - 34347$

$\Rightarrow n = 2$ years

Q2) $P = ₹16000$, $R = 20\%$ PA $= \frac{20}{4}\%$ quaterly

$T = 9$ months $= 3$ (Quaterly)

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

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

$C.I = A - P = 18522 - 16000 = ₹2522$

Q3) C.I when interest compounded yearly :

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

$= ₹5304$

C.I when interest compounded half yearly

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

Difference. $(5306.04 - 5304) = ₹2.04$

Q4 $r = 8\%$, $t = 2$, let sum be P

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

$C.I = A - P$

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

$\Rightarrow P\left[1+\frac{8}{100}\right]^2 - 1 \Rightarrow P\left[\frac{27}{25}\right]^2 - 1 \Rightarrow P\left[\frac{729}{625}\right] - 1 \Rightarrow P \times \frac{104}{625}$

~~Now, (1+S1 = 16~~

~~?~~

~~t = 2 years, R = 10%.~~

~~$A = P\left[\frac{100+R}{100}\right]^n$~~

~~= 4000~~

Q5) R = 5% p.a, t = 3 years, SI = ₹1200

$P = \frac{100 \times 1200}{3 \times 5} = ₹8000$

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

CI = ₹(9261 − 8000) = ₹1261

Q6) SI on ₹7350 for 1 year

= (8575 − 7350) = ₹1225

$R = \left[\frac{100 \times 1225 \times 1}{7350}\right]\% = 16\frac{2}{3}\%$

Let the sum be ₹P,

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

$P \times \frac{7}{6} \times \frac{7}{6} = 4350 \Rightarrow P = \left(7350 \times \frac{36}{49}\right) = ₹5400.$

Q7) R = 10% t = 2 years

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

CI (half yearly)

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

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

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

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

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

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

Q8) Let the sum be x

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

$$S.I = \frac{x \times 10 \times 2}{100} \Rightarrow C.I - S.I = \frac{x}{100} \Rightarrow \frac{x}{100} = 691 \Rightarrow x = 69100$$

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

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

Q10) Let the required number be n years.

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

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