How

SI and CI

① If the CI on a certain sum of 2 yrs at 10% pa is ₹525. The SI on the same sum for double the time at half the rate percent per annum is:

Let P = x

Sol: $CI = P\left[\left(1+\frac{r}{100}\right)^n - 1\right]$

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

$= x\left[\left(\frac{11}{10}\right)^2 - 1\right]$

$= x\left[\frac{121}{100} - 1\right]$

$= x\left(\frac{121-100}{100}\right)$

$525 = \frac{21}{100}x$

$x = \frac{525 \times 100}{21}$

$= ₹2500$

$P = ₹2500$ $\quad R\% = \frac{10}{2} = 5\%$ $\quad T = 2\times 2 = 4$ yrs.

$SI = \frac{PRT}{100} = \frac{2500 \times 5 \times 4}{100} = ₹500$ (B)

(2) The simple interest on a certain sum of money for 3 yrs at 8% pa is half the compound interest on ₹4000 for 2yrs at 10% pa. The sum placed on SI is:

sol: $CI = P\left[\left(1+\frac{r}{100}\right)^n - 1\right]$

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

$= 4000\left[\left(\frac{11}{10}\right)^2 - 1\right]$

$= 4000\left(\frac{121}{100} - 1\right)$

$= 4000\left(\frac{121-100}{100}\right)$

$= 4000\left(\frac{21}{100}\right)$

$= ₹840$

SI = half of CI

$= \frac{840}{2} = ₹420$

$SI = \frac{PRT}{100}$

$420 = \frac{P \times 8 \times 3}{100}$

$P = \frac{420 \times 100}{8 \times 3} = ₹1750$

(3) There is 60% increase in an amount in 6 yrs at SI. What will be the CI of ₹19000 after 3yrs at the same rate.

sol: SI = 60% in 6 yrs

SI in 1 yr = $\frac{60}{6} = 10\%$ pa

r% = 10% pa.

$CI = 19000\left[\left(1+\frac{10}{100}\right)^3 - 1\right]$

$= 19000\left[\frac{1331}{1000} - 1\right]$

$= 19000 \times \frac{331}{1000} = ₹3972$

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④ The difference between CI and SI on an amount of ₹15000 for 2 yrs is ₹96. What is the rate of interest pa?

Let r% = x

Sol: $CI - SI = P\left[\left(1+\frac{r}{100}\right)^n - 1\right] - \frac{PRT}{100}$

$96 = 15000\left[\left(1+\frac{x}{100}\right)^2 - 1\right] - \frac{15000 \times x \times 2}{100}$

$96 = 15000\left[\left(\frac{100+x}{100}\right)^2 - 1\right] - 300x$

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

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

$x = \sqrt{64} = 8\%$