BALABHADRA SKILL DEVELOPMENT ACADEMY
MATHS FORMULA - 10
ARITHMETIC

COMPOUND INTEREST

Sl	Situation	Formula
1	If compound interest accrued on Rs. P at r % rate of compound interest for t yr is CI and compound amount Rs. is A, then	(i)$A=P\left(1+\frac{r}{100}\right)^t$ (ii)A=P + CI (iii)$CI=P\left\{\left(1+\frac{r}{100}\right)^t-1\right\}$ (iv) $r=\left\{\left(\frac{A}{P}\right)^{1/t}-1\right\}\times 100\%$ (v)$P=\frac{A}{\left(1+\frac{r}{100}\right)^t}$ (vi)compound interest (CI)= $SI\left(1+\frac{r}{200}\right)$
2	If interest is compounded half-yearly, then	$Amount=P\left(1+\frac{R}{2\times 100}\right)^{2t}$
3	If interest is compounded quarterly, then	$Amount=P\left(1+\frac{R}{4\times 100}\right)^{4t}$
4	If interest is compounded annually but time is given in fraction(say time, $t=c\frac{a}{b}$ yr),then	$Amount=P\left(1+\frac{r}{100}\right)^c\times\left(1+\frac{(a/b)^r}{100}\right)$
5	The difference between simple and compound interests accrued on Rs. P at the rate of interest of r% (i) for 2yr is equal to and (ii) for 3 yr equal to	(i) $\frac{Pr^2}{(100)^2}$ (ii) $\frac{Pr^2(300+r)}{(100)^3}$
6	When the rates of interest for three consecutive years are $r_1\%$, $r_2\%$, and $r_3\%$, respectively, then	$A=P\left(1+\frac{r_1}{100}\right)\left(1+\frac{r_2}{100}\right)\left(1+\frac{r_3}{100}\right)$
7	If an amount becomes x_1 times of itself in n_1 year and x_2 times of itself in n_2 yr. or If a sum of money becomes Rs x_1 after n_1 yr at the rate of compound interest and Rs x_2 after n_2 yr, then	Rate of interest, $r=\left\{\left(\frac{X_2}{X_1}\right)^{\frac{1}{n_2-n_1}}-1\right\}\times 100\%$

8	If compound interest on an amount for 2 yr at some rate of interest is CI and simple interest on the same amount at the same rate of interest for 2 yr is SI, then	Principal = $\frac{(SI)^2}{4(CI-SI)}$
9	If compound interests on an amount for two consecutive years are C_1 and C_2 respectively, then	Rate of interest = $\frac{C_2-C_1}{C_1} \times 100\%$
10	If simple interest for a certain sum for 2 yr at the annual rate of interest R% is SI, then compound interest for same duration and same rate is	CI=SI$\left(1+\frac{R}{200}\right)$
11	If a loan of A at R% compound interest per annum is to be repaid in n equal yearly instalments, then the value of each instalment is given by	$\frac{A}{\left(\frac{100}{100+R}\right)+\left(\frac{100}{100+R}\right)^2+\cdots\cdots+\left(\frac{100}{100+R}\right)^n}$