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## Compound Interest Questions Quiz for CDS, CLAT, SSC and Bank Clerk Pre Exams.

## Compound Interest Quiz 4

Directions: Kindly study the following Questions carefully and choose the right answer:

1. Sanjay purchased a hotel worth rupees 10 lakhs and Anita purchased a car worth Rs. 16 lakh. The value of hotel every year increase by $20 \%$ of the previous value and the value of car every depreciates by $25 \%$. What is the difference between the price of hotel and car after 3 years?
A.10,53,000
B. $10,63,000$
C. $11,53,000$
D. $10,43,000$
2. C.I. Rs. 5000 for 3 years at $8 \%$ for 1 st year and $10 \%$ for 2 nd year and $12 \%$ for 3 rd year will be-
A. 1325.6
B. 1652.8
C. 1734.9
D. 1263.8
3. $A$ has lent some money to $B$ at $6 \%$ p.a. and $C$ at $10 \%$ at the end of the year he has gain the overall interest at 8\% p.a. in what ratio has he lent the money to $A$ and $B$ ?
A. $1: 2$
B. $2: 1$
C. $1: 1$
D. $2: 3$
4. Loan of 10,000 was lent to a person at for 3 years @ 10\% for 1st year, 15\% for rest 2 years. Find the amount?
A. 14537.5
B. 14547.5
C. 14647.5
D. 14537.8
5. The difference between C.I. and S.I. on a sum of money lent for 2 years at $10 \%$ is Rs. 40. The sum is:
A. 2,000
B. 3,500
C. 3,700
D. 4,000
6. If $P$ is the principal amount and the rate of interest is $r \%$ per annum and the compound interest is calculated $k$ times in a year, what is the amount at the end of $n$ year?
A. $\mathrm{P}\left(1+\frac{r}{100 k}\right)^{\mathrm{nk}}$
B. $\mathrm{P}\left(1+\frac{k r}{100}\right)^{\mathrm{nk}}$
C. $\mathrm{P}\left(1+\frac{k r}{100}\right)^{n / k}$
D. $\mathrm{P}\left(1+\frac{k r}{100 k}\right)^{\mathrm{n} / k}$
7. An amount of Rs. $X$ at compound interest at $20 \%$ per annum for 3 year becomes $y$. what is $y: x$ ?
A. $3: 1$
B. $36: 25$
C. $216: 125$
D. $125: 216$
8. What is the least number of complete year in which a sum of money at $\mathbf{2 0 \%}$ compound interest will be more than doubled?
A. 7
B. 6
C. 5
D. 4
9. What is the compound interest on Rs. 1600 at $25 \%$ per annum of 2 year compounded annually?
A. Rs. 700
B. Rs. 750
C. Rs. 800
D. Rs. 900
10. On what sum of money will the difference between simple interest and compound interest for 2 years at 5\% pa be equal to Rs. 63?
A. Rs. 25,200
B. Rs. 24,800
C. Rs. 25,500
D. Rs. 24,600

## Correct Answers:

| $\mathbf{1}$ | $\mathbf{2}$ | $\mathbf{3}$ | $\mathbf{4}$ | $\mathbf{5}$ | $\mathbf{6}$ | $\mathbf{7}$ | $\mathbf{8}$ | $\mathbf{9}$ | $\mathbf{1 0}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A | B | C | B | D | A | C | D | D | A |

## Explanations:

1. 

Amount of the hotel after 3 years $=10$ lakh $\left(1+\frac{20}{100}\right)^{3}$.
$=10 \operatorname{lakh}\left(\frac{6}{5}\right)^{3}=10,00,000 \times \frac{216}{125}$
$\Rightarrow 1728000$.
Amount of the car after 3 years $=16$ lakh $\left(1-\frac{25}{100}\right)^{3}$.
$=16 \operatorname{lakh}\left(\frac{3}{4}\right)^{3}$
$=16,00,000 \times \frac{27}{64}$
$=6,75,000$.
Difference $=17,28,000-6,75,000=10,53,000$.
Hence, option A is correct.

## 2.

Rate of interest for 1st, 2nd and 3rd year $=8 \%, 10 \%$ and $12 \%$
Now, P = 5000, T = 3 years
By the net\% effect we would calculate the effective compound rate of interest for 3 years $=33.056 \%$ (Refer to sub-details)
Therefore, $\mathrm{Cl}=33.056 \%$ of 5000
$\mathrm{Cl}=\frac{33.056 \times 5000}{100}=$ Rs. 1652.8

## Sub-details:

Calculation of effective compound rate of interest for 3 years will be as follows.
For the first 2 years, let's apply the net\% effect.
Here, $x=8$ and $y=10 \%$
Net\% effect $=x+y=\frac{x y}{100}$
$=8+10+\frac{8 \times 10}{100}=18+0.8=18.8 \%$
Now let's take this $18.8 \%$ as $x$ and $12 \%$ as $y$ for the calculation of 3rd year.
$=18.8+12+\frac{18.8 \times 12}{100}=30.8+2.256=33.056 \%$
Traditional Method:
C.I. $=5000\left(1+\frac{8}{100}\right)\left(1+\frac{10}{100}\right)\left(1+\frac{12}{100}\right)-5000$.
$=5000\left[\left(\frac{27}{25}\right)\left(\frac{11}{10}\right)\left(\frac{28}{25}\right)-1\right]$
$=5000\left[\frac{27 \times 11 \times 28}{6250}-1\right]=5000\left[\frac{27 \times 11 \times 28-6250}{6250}\right]$.
$=4 \times \frac{2066}{5}$
= Rs. 1652.8 .
Hence, option B is correct.
3. By alligation and mixture:

the ratio is- $2: 2=1: 1$.
Hence, option C is correct.
4. Rate of interest for 1 st, 2 nd and 3 rd year $=10 \%, 15 \%$ and $15 \%$
$P=10000, T=3$ years,
By the net\% effect we would calculate the effective compound rate of interest for 3 years $=45.475 \%$ (Refer to sub-details)
Principal $=100 \%$; Amount $(\mathrm{P}+\mathrm{Cl})=100+45.475=145.475 \%$
100\% 三 Rs. 10000
$145.475 \%$ ミRs. $x$
By the cross multiplication, we get
$x=\frac{10000 \times 145.475}{100}=$ Rs. 14547.5

## Sub-details:

Calculation of effective compound rate of interest for 3 years will be as follows.
For the first 2 years, let's apply the net\% effect.
Here, $x=10$ and $y=15 \%$

Net\% effect $=x+y=\frac{x y}{100}$
$=10+15+\frac{10 \times 15}{100}=25+1.5=26.5 \%$
Now let's take this $26.5 \%$ as $x$ and $15 \%$ as $y$ for the calculation of 3rd year.
$=26.5+15+\frac{26.5 \times 15}{100}=41.5+3.975=45.475 \%$

## Traditional Method:

$A=10,000\left(1+\frac{10}{100}\right)\left(1+\frac{15}{100}\right)^{2}$
$A=10,000\left(\frac{11}{10}\right)\left(\frac{20+3}{20}\right)^{2}$
$A=10,000\left(\frac{11}{10}\right)\left(\frac{23}{20}\right)\left(\frac{23}{20}\right)$.
$\Rightarrow 10 \times \frac{11 \times 23 \times 23}{4} \Rightarrow$ Rs. 14547.5.

Hence, option B is correct.

## 5. Method I:

To solve this question, we can apply a short trick approach
Sum $=\frac{\text { Difference } \times 100^{2}}{r^{2}}$
Given,
Difference $=40, r=10 \%$
By the short trick approach, we get
Sum $=\frac{40 \times 100^{2}}{10^{2}}=4000 /-$

## Method II:

We can solve it by the net\% formula,
Rate \% of SI for 2 yr at $10 \% \mathrm{pa}=10 \times 2=20 \%$
Rate \% of Cl for 2 yr at 10\%,
$=10+10+\frac{10 \times 10}{100}=21 \%$
$\%$ rate difference of Cl and $\mathrm{SI}=21 \%-20=1 \%$
Let the sum be $x$, then
$1 \%$ of $x=40$
$x=\frac{40 \times 100}{1}=$ Rs. 4,000
Hence, option D is correct.
6. Given, principal amount $=$ Rs. $P$

Rate of interest, $r=\frac{r}{k} \%$
and Time, $\mathrm{t}=\mathrm{nk}$
$\therefore \quad A=P\left(1+\frac{r}{100 k}\right)^{n k}$
Hence, option A is correct.
7. Let $P=$ Rs. $x, r=20 \%, t=3$ year, $A=R s . y$
$\because A=P\left(1+\frac{r}{100}\right)^{t}$
$\Rightarrow y=x\left(1+\frac{20}{100}\right)^{3}$
$\Rightarrow y=x\left(\frac{6}{5}\right)^{3}$
$\Rightarrow \frac{y}{x}=\left(\frac{6}{5}\right)^{3}=\frac{216}{125}$
$\therefore \mathrm{y}: \mathrm{x}=216$ : 125 .
Hence, option C is correct.

## 8. Method I:

Let the sum of money = Rs. P
$\therefore$ Amount $=2$ P
$\because A=P\left(1+\frac{r}{100}\right)^{t} \Rightarrow 2 P=P\left(1+\frac{20}{100}\right)^{t}$
$\Rightarrow \frac{2 P}{P}=\left(\frac{6}{5}\right)^{t} \Rightarrow 2=\left(\frac{6}{5}\right)^{t}$
On putting $t=4$, we get
$\Rightarrow\left(\frac{6}{5}\right)^{4}=\frac{1296}{625}=2$ (approx.)
$\therefore$ Least number of year $=4$.

## Method II:

A sum will get double of itself at an overall interest rate of $100 \%$
Let's apply the net\% effect formula to get to know how many years would it take for interest to go beyond 100\%
Net\% effect for 1 st $2 \mathrm{yrs}=20+20+\frac{20 \times 20}{100}=44 \%$
Again, for next $1 \mathrm{yr}=44+20+\frac{44 \times 20}{100}=72.8 \%$
Again, for next $1 \mathrm{yr}=72.8+20+\frac{72.8 \times 20}{100}=107.36 \%$
Here, we can see that in 4 yrs the given compound rate of interest is occurring to more than $100 \%$.
Therefore, 4 yrs is the correct answer.
Hence, option D is correct.
9. To solve this question we can apply a short trick approach

Net\% effect $=x+y+\frac{x y}{100}$
$P=$ Rs. $1600, r=25 \%$ and $n=2$ year

By the short trick approach, we get
Net\% effect $=25+25+\frac{25 \times 25}{100}=50+6.25=56.25$.


By the cross multiplication, we get
$x=\frac{56.25 \times 1600}{100}=900 /-$
Hence, option D is correct.

## 10. Method I:

To solve this question, we can apply a short trick approach
Sum $=\frac{\text { Difference } \times 100^{2}}{r^{2}}$
Given,
Difference $=63, \quad r=5 \%$
By the short trick approach, we get
Sum $=\frac{63 \times 100^{2}}{5^{2}}=25200 /-$

## Method II:

We can solve it by the net\% effect formula,
Rate \% of SI for 2 yr at $5 \% \mathrm{pa}=5 \times 2=10 \%$
Rate \% of Cl for 2 yr at $5 \% \mathrm{pa}$
$=5+5+\frac{5 \times 5}{100}=10.25 \%$
\% rate difference of CI and $\mathrm{SI}=10.25 \%-10 \%=.25 \%$
Let the sum be $x$, then
$0.25 \%$ of $x=63$
$x=\frac{63 \times 100}{0.25}=$ Rs. 25,200

Hence, option A is correct.


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