

Home Work Question

The price of an articles is first decreased by 20% and then increased by 30%. If the resulting price is ₹ 416, the original price of the article is

A) ₹ 350

B) ₹ 405

C) ₹ 400

D) ₹ 450

$$\begin{aligned} & \text{Original Price: } 400 \xrightarrow{20\% \downarrow} \text{Intermediate Value} \xrightarrow{30\% \uparrow} 416 \\ & \text{Final Price: } 416 \xrightarrow{104\% - 416} 17. - 4 \\ & \text{Calculation: } a + b + \frac{ab}{100} = -20 + 30 + \frac{(-20)(30)}{100} = 10 - 6 = 4\% \end{aligned}$$

USE CODE

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Simple Interest

unacademy

$$SI = \frac{P \times R \times T}{100}$$

Simple Interest

$$\begin{aligned} SI &= \left(\frac{P}{100} \right) \times R \times T \\ &\quad \text{↳ } 1\% \text{ of } P \\ &= RT \% \cdot \text{ of } P \\ SI &= T [R \% \cdot \text{ of } P] \end{aligned}$$



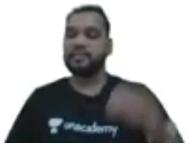
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$$SI = T [R \% \text{ of } P]$$

~~Q~~ $P = 100, R = 10\% \text{ p.a.}, T = 3 \text{ years}$

$$SI = 3 [\underline{\underline{10\% \text{ of } 100}}] = 3 [\underline{\underline{10}}] = \underline{\underline{30}}$$



ex

£ 2000
P →
300
\$ Interest
per

$$R = \underline{15\% PA} \quad T = 5 \text{ years}$$

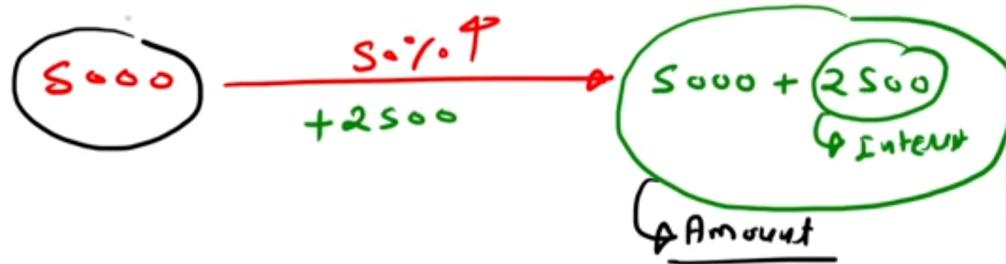
$$\underline{300 \times 5 = 1500}$$

(MD) $15\% \times 5 = 75\%$

$$\frac{2000}{4} \times 3 = \underline{\underline{150}}$$



I \$1000 R.I = 5% PA T = 10 years





1) If a sum of money at simple interest doubles in 6 years, it will be 4 times in

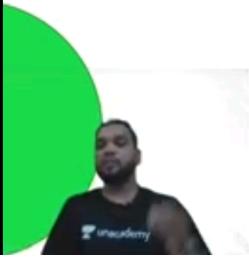
[AAI (ATC)-2016]

- A) 12 years B) 14 years C) 16 years D) 18 years

#SI

$$x \frac{6 \text{ year}}{100\%} \rightarrow 2x = x + x$$

$$x \frac{18 \text{ year}}{300\%} \rightarrow 4x = x + 3x$$



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2) At what rate of simple interest, will a sum of money double itself in 4 years?

A) 50%

B) 25%

C) 20%

D) 24%

$$x \xrightarrow[100\% \uparrow]{4 \text{ year}} 2x$$

$$1 \text{ year} \rightarrow \underline{\underline{25\%}}$$



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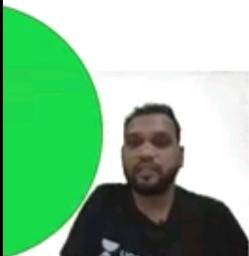




- 3) A principal becomes 5 times of itself in 10 years. What should be the rate of interest p.a.?
- A) 50 ✓ B) 40 C) 30 D) NOTA

$$x \xrightarrow[10 \text{ years}]{400\% \text{ P}} 5x$$

$$\frac{400}{10} = \underline{40\% \text{ P.A}}$$



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4) In how many years Simple interest on principal be equal to the principal at the rate of 25% p.a.?

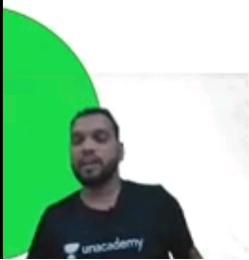
A) 4

B) 3

C) 2

D) NOTA

$$x \xrightarrow[100\%]{4 \text{ years}} x + x$$



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Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI



- 5) Simple interest on ₹500 for 4 years at 6.25% per annum is equal to the simple interest on ₹400 at 5% per annum for a certain period of time. The period of time is
 [RRB-2014(JE), BILASPUR]
- (A) 4 years (B) 5 years (C) $6\frac{1}{4}$ years (D) $8\frac{2}{3}$ years

$$25\% \text{ of } 500 = (5\% \text{ of } 400) T$$

$$125 = 20 T$$

$$T = \frac{25}{4} = 6\frac{1}{4}$$

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~~**~~ A principal becomes ₹900 after 3 years and ₹1200 after 6 years on simple interest, then find the principal and rate of interest?

- A) 500, 10% B) 600, 16.67% C) 500, 16.67% D) 600, 10%

#SI

$$\begin{array}{c}
 600 \xrightarrow[+300]{\text{3 years}} 900 \\
 +300 \\
 \hline
 600 \xrightarrow[+600]{\text{6 years}} 1200
 \end{array}$$

$$\begin{aligned}
 3 \text{ years} &= 300 \\
 1 \text{ year} &= 100
 \end{aligned}$$



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Home Work Question

An amount fetched a total simple interest of **Rs 3200** at the rate of 6.25% per year in 4 years.

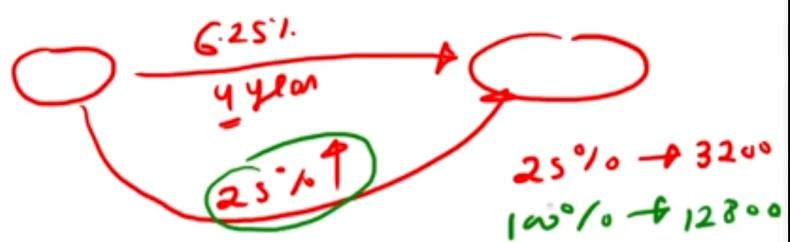
What is the amount (in Rs)?

A) 13800

B) 11800

 12800 [AAI(ATC)-2016]

C) 12800
D) 14800



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**Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI**

- 1) A sum of ₹3200 becomes ₹3776 in 3 years at a certain rate of simple interest. What is the rate of interest per annum?
- A) 18% B) 9% C) 6% D) 3%

$$\begin{array}{ccccccc} 3200 & & \xrightarrow[3 \text{ years}]{+576} & 3776 \\ & \nearrow & & & & & \\ & & 192 & & \frac{192}{3200} \times 100 & & 6\% \end{array}$$

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Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI

- 2) A certain sum is invested for certain time. It amounts to ₹3500 at 10% per annum. But when invested at 8% per annum, it amounts to ₹3000, then find the time & principal?
- A) 25 year, ₹2500 B) 25 year, ₹1000 C) 15 year, ₹2500 D) 15 year, ₹1000

$$P \xrightarrow[\tau]{10\% PA} 3500 = P + 10T \% \text{ of } P$$

$$P \xrightarrow[\tau]{8\% PA} 3000 = P + 8T \% \text{ of } P$$

$$2T \% \text{ of } P = 500$$

$$\frac{P}{100} \times 2T = 500 \quad PT = \underline{\underline{2500}}$$

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Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI

3) A sum was put at simple interest at a certain rate for 3 years. Had it been put at 2% higher rate, it would have fetched Rs 360 more. Find the sum.

A) 4000

B) 5000

C) 6000

D) NOTA

$$\begin{array}{c}
 \text{Diagram: } P \xrightarrow[3 \text{ year}]{x\% \uparrow} A \\
 \text{Given: } P = 6000 \\
 \text{Equation: } I = 3x\% \text{ of } P \\
 \\
 \text{Diagram: } P \xrightarrow[3 \text{ year}]{(x+2)\% \uparrow} A + 360 \\
 \text{Given: } P = 6000 \\
 \text{Equation: } I = 3(x+2)\% \text{ of } P \\
 \\
 6\% \text{ of } P = 36 \\
 6\% \xrightarrow{\quad} 36 \\
 1\% \xrightarrow{\quad} 6
 \end{array}$$

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**Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI**

- Q) Simple interest on a certain sum is $\frac{16}{25}$ of the sum. Find the rate percent and time, if both are numerically equal.
- A) Rate = 7% and Time = 7 years
B) Rate = 8% and Time = 8 years
C) Rate = 6% and Time = 6 years
D) Rate = 5% and Time = 5 years

$$SI = \frac{16}{25} P \Rightarrow SI = \frac{16 \times 4 \times \frac{P}{100}}{P} = 64\% \text{ of } P$$

$$SI = 64\% \text{ of } P$$

$$SI = RT \% \text{ of } P$$

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Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI

- Q) The difference between the simple interest received from two different sources on Rs.1500 for 3 years is Rs.13.50. The difference between their rates of interest is
- A) 0.1 % B) 0.2 % C) 0.3 % D) 0.4 %

$$\begin{aligned}
 &\text{1500} \xrightarrow[3 \text{ year } x\%]{\rightarrow} 1500 + I_1 \quad I_1 = 3x\% \text{ of } 1500 \\
 &\text{1500} \xrightarrow[3 \text{ year } y\%]{\rightarrow} 1500 + I_2 \quad I_2 = 3y\% \text{ of } 1500 \\
 &3(x-y)\% \text{ of } 1500 = 13.50 \\
 &x-y = \frac{13.50}{1500} \times 100 = \frac{13.50}{15} = 0.90
 \end{aligned}$$



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➤ Half yearly/quarterly Concept



$P = 1000$, $T = 2$ year, $ROI = 10\% PA$	$T = 4$ months	$T = 8$ months
Anually $T = 2$ $ROI = 10\%$	Half yearly $T = 4$ months	Quarterly $\rightarrow 3$ months $T = 8$ $ROI = 2.5\%$



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$$P = ₹ 100, R \circ I = 10\%, P.A, T = 1 \text{ year}$$

① Annually

$$100 \xrightarrow[+10]{10\%} 110$$

② H.Y $R \circ I = 5\%$, $T = 2$

$$100 \xrightarrow[+5]{5\%} 100 + 5 \xrightarrow[+5]{5\%} 110$$

③ Quarterly, $R \circ I = 2.5\%$, $T = 4$

$$100 \xrightarrow[+2.5]{2.5\%} 100 + 2.5 \xrightarrow[+2.5]{2.5\%} 100 + 5 \xrightarrow[+2.5]{2.5\%} 100 + 7.5 \xrightarrow[+2.5]{2.5\%} 110$$





$$\textcircled{1} \quad 100 \quad R \cdot I = 20\% \cdot PA \quad T = 1 \text{ year}$$

$$\textcircled{1} \quad 100 \xrightarrow[+20]{20\% \cdot P} 120$$

$$\textcircled{2} \quad 100 \quad R \cdot I = 20\% \quad T = 1 \frac{1}{2} \text{ years}$$

$$\textcircled{2} \quad 100 \xrightarrow[+30]{30\% \cdot P} 130$$



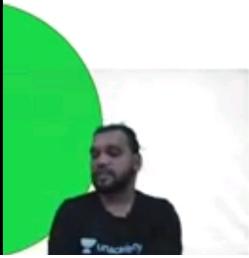
Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI

Q) What is the simple interest to be paid on a principal of ₹24000 borrowed at a rate of 15% for a period of 3 years and 6 months? [ONGC]

- A) ₹14400 B) ₹13200 C) ₹10800 D) ₹12600

$$\begin{aligned}
 & \text{24000} \quad \cancel{\text{15\%}} + \cancel{\text{75\%}} \\
 & \quad \downarrow \quad \quad \downarrow \\
 & \quad \text{3 years} \quad \text{6 months} \\
 & \text{525\%} = \text{5\%} + \underline{\text{2.5\%}} \\
 & \quad \quad \quad \text{12000} + 600 \\
 & \quad \quad \quad - \underline{\underline{1260}}
 \end{aligned}$$

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Home Work Question

Find the simple interest on ₹4800 at the rate of 8.5% per annum for a period of 2 years 3 months. [RRB-2014(JE), BILASPUR]

A) ₹796

B) ₹816

C) ₹918

D) ₹990

$$\begin{aligned}2 \text{ year } &\rightarrow 17\% \\3 \text{ month } &\rightarrow \frac{8.5}{4} = 2.125\% \quad \left. \begin{array}{l} \\ \end{array} \right\} = 19\% \end{aligned}$$

$$4800 \times 19\% = 912$$

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Compound Interest(CI)

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$$A = P \left(1 + \frac{R}{100} \right)^T \quad I = A - P = P \left(1 + \frac{R}{100} \right)^T - P$$

e.g. P = 100, R = 10%, T = 2 years

$$A = 100 \left(1 + \frac{10}{100} \right)^2 = 100 (1.1)^2 \rightarrow 100 \times 1.1 \times 1.1$$

$$= 100 \xrightarrow{+10} 110 \xrightarrow{+11} 121$$

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CI

$$\begin{array}{ccccccc}
 & 1000 & , & 10\% \text{ PA} & , & T = 3 \text{ years} \\
 100 & \xrightarrow[+10]{10\% \uparrow} & 110 & \xrightarrow[+11]{10\% \uparrow} & 121 & \xrightarrow[+12.1]{10\% \uparrow} & 133.1 \\
 & & & & & & \text{---} \\
 & & & & +33.1 & & \\
 & & & & \uparrow 33.1\% & & \\
 & & & & & &
 \end{array}$$

10^9 10^9 10^9
 33.1%





Simple & Compound Interest-3 | Basic Concept | General Aptitude | Lec 46 | GATE CE



$$\# \$5000 \quad R\% = 20\% \quad T = 2 \text{ years}$$

~~Pr-I~~ $\frac{20\% \cdot T}{\$5000} + \5000 ~~Pr-II~~ $\frac{20\% \cdot T}{\$5000} + \5000

$$\frac{20\% \cdot 1}{\$5000} + \$5000 = \$1000 \quad \frac{20\% \cdot 2}{\$5000} + \$5000 = \$1200$$
$$\frac{20\% \cdot 1}{\$5000} + \$5000 = \$1000 \quad \frac{20\% \cdot 2}{\$5000} + \$5000 = \$1200$$

~~Pr-II~~ $\frac{20\% \cdot 1}{\$5000} + \$5000 = \$1000 \quad \frac{20\% \cdot 2}{\$5000} + \$5000 = \1200

$$\left(a + b + \frac{ab}{100} \right)$$

$\frac{20\% \cdot 1}{\$5000} + \$5000 = \$1000 \quad \frac{20\% \cdot 2}{\$5000} + \$5000 = \1200

$\frac{20\% \cdot 1}{\$5000} + \$5000 = \$1000 \quad \frac{20\% \cdot 2}{\$5000} + \$5000 = \1200

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$\frac{20\% \cdot 1}{\$5000} + \$5000 = \$1000 \quad \frac{20\% \cdot 2}{\$5000} + \$5000 = \1200

30:10 / 58:50

GATE 2021

46

* Use with base verb "to" * Use with auxiliary verb "do" when negative
MODALS

Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI

1) ₹5000 invested on compound interest for 2 years at the rate of 10% per annum, then find the amount and interest after 2 years

A) ₹6050, ₹1050

B) ₹6000, ₹1000

C) ₹6025, ₹1025

D) NOTA

$$\begin{array}{c}
 5000 \xrightarrow[+1050]{21\% \uparrow} 6050 \\
 \text{↓} \\
 5000 \xrightarrow[+500]{10\% \uparrow} 5500 \xrightarrow[+550]{10\% \uparrow} 6050
 \end{array}$$



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Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI

2) ₹1000 invested on compound interest for 3 years at the rate of 10%, 20%, 10% for 1st, 2nd and 3rd year respectively, then find the amount after 3 years

- A) ₹1252 B) ₹1352 C) ₹1452 D) ₹1652

$$\begin{array}{r} 1000 \\ \xrightarrow[+100]{10\%} 1100 \\ \xrightarrow[+220]{20\%} 1320 \\ \xrightarrow[+132]{10\%} 1452 \end{array}$$



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Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI

2) ₹1000 invested on compound interest for 3 years at the rate of 10%, 20%, 10% for 1st, 2nd and 3rd year respectively, then find the amount after 3 years

- A) ₹1252 B) ₹1352 C) ₹1452 D) ₹1652

The handwritten solution shows three separate calculations for each year's interest rate:

- First Year:** ₹1000 is multiplied by 10% (1.10) to get ₹1100.
- Second Year:** ₹1100 is multiplied by 20% (1.20) to get ₹1320.
- Third Year:** ₹1320 is multiplied by 10% (1.10) to get ₹1452.

Below these, a summary calculation shows the final amount of ₹1452 being multiplied by 10% (1.10) to get ₹1425, which is then multiplied by 20% (1.20) to get ₹1652. This is annotated with arrows indicating the flow from the first year's result to the second, and the second year's result to the third.

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Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI

Q) On a certain principal the compound interest compounded annually for the second year at 10% per annum is ₹132. The principal is

- A) ₹ 1250 B) ₹1000 C) ₹1200 D) ₹1320

$$\begin{array}{ccccccc}
 & 1200 & \xrightarrow[+120]{10\%} & 1320 & \xrightarrow[+132]{10\%} & \\
 \text{1200} & & & 1320 & & \\
 \downarrow & & & \downarrow & & \\
 100\% & & & 110\% & & \\
 & & & 110\% \rightarrow 1320 & & \\
 & & & 110\% \rightarrow 132 & & \\
 & & & 10\% \rightarrow 12 & & \\
 & & & 100\% \rightarrow 1200 & &
 \end{array}$$

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Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI

4) A sum of money doubles itself at some rate of compound interest in 15 year. In how many years will it become **eight times** of itself with the **same rate**?

- A) 30 B) 40 C) 45 D) NOTA

$$x \xrightarrow{T=15y} 2x \xrightarrow{15y} 4x \xrightarrow{15y} 8x$$



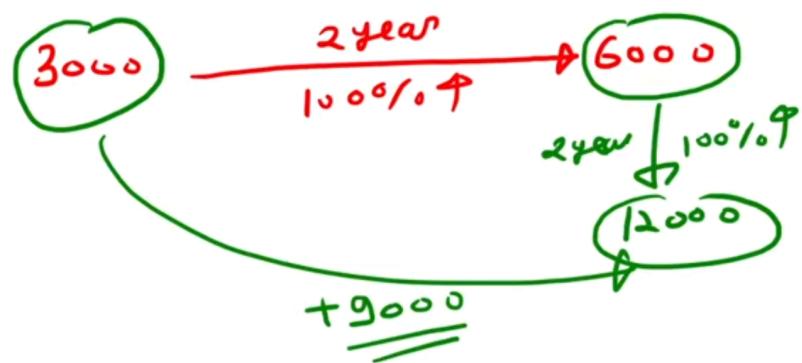
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5) A sum of ₹ 3000 amounts to ₹6000 in two years at compound interest. The interest for four year is:

- A) ₹ 9000 B) ₹12000 C) ₹6000 D) ₹3000



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Home Work Question

What will be the amount for a sum of ₹1491 at 10% for 3 years compounded annually?

- A) ₹1938.3 B) ₹1984.5 C) ₹1955.5 D) ₹2004.3

$$\begin{array}{r}
 \text{B) } \text{₹}1984.5 \\
 \text{C) } \text{₹}1955.5 \\
 \text{D) } \text{₹}2004.1
 \end{array}
 \begin{array}{r}
 101.9 \quad 101.9 \quad 101.9 \\
 \times 3 = 333.7 \\
 \hline
 331.79
 \end{array}
 \rightarrow \underline{\underline{331.79}}$$

THE CODE

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1) The compound interest on rs.30000 at 7% per annum is Rs.4347. The period is

[RRB-JE]

- A) 2 year B) 2.5 year C) 3 year D) 4 year

$$\begin{array}{ccc} \cancel{30000} & \xrightarrow{\frac{7\% \cdot T}{N \text{ year}}} & \\ \cancel{7\% \cdot 2100} & & +4347 \end{array}$$



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Half Yearly/Quarterly Concept in CI

$$P = ₹ 2000, R \cdot I = 10\% \text{ p.a} \quad T = 1 \text{ year}$$

Anually

$$P = ₹ 2000$$

$$R \cdot I = 10\%$$

$$T = 1$$

Half yearly

$$P = ₹ 2000$$

$$R \cdot I = 5\%$$

$$T = 2$$

quarterly $\rightarrow 3 \text{ month}$

$$P = ₹ 2000$$

$$R \cdot I = 2.5\%$$

$$T = 4$$

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Half Yearly/Quarterly Concept in CI

₹ 2000 $R \cdot I = 10\% \cdot T = 1 \text{ year}$

(1) Annually $2000 \xrightarrow[+200]{10\% \cdot 1} 2000 + 200 = 2200$



(2) H.Y. $R \cdot I = 5\% \cdot T = 2$

$2000 \xrightarrow[+100]{5\% \cdot 1} 2100 \xrightarrow[+105]{5\% \cdot 1} 2205$

(3) Quarterly $R \cdot I = 2.5\% \cdot T = 4$

$2000 \xrightarrow[+50]{2.5\% \cdot 1} 2050 \xrightarrow[+5125]{2.5\% \cdot 1} 2125 \xrightarrow[+5125]{2.5\% \cdot 1} 22125$

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Half Yearly/Quarterly Concept in CI



\$5000 ROI = 20% T= 2 years

$$\textcircled{1} \text{ Annually} \quad \begin{array}{c} \text{ } \\ \text{ } \end{array} \quad \begin{array}{c} \text{ } \\ \text{ } \end{array} \quad \begin{array}{c} \text{ } \\ \text{ } \end{array}$$

$$\textcircled{2} \text{ H.Y } \text{ ROI} = \frac{10\%}{10\%} = 100\%$$

~~5000~~ ~~47411.9~~

$$\begin{array}{r} 33.1 + 1.0 \\ \hline 34.1 + 3.31 \\ \hline 47.41 \% \end{array}$$

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Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI

2) ₹2000 invested for 2 years at the rate of 20% p.a. on compound interest but interest to be calculated half yearly. Then find the amount after 2 years?

- A) ₹2728.2 B) ₹2928.2 C) ₹2828.2 D) ₹2628.2

$$2000 \quad T=2 \text{ years} \quad R.O.I = 20\% \text{ p.a}$$

$$\text{Hence } 2000 \quad T=4 \quad R.O.I = 10\% \\ 10\% \cdot 10\% \cdot 10\% \cdot 10\% = 47.41\%$$

$$2000 \quad \frac{47.41\%}{+ 948.2} \quad 2948.2$$



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Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI

3) ₹2000 invested for 9 months at the rate of 16% p.a. on compound interest but interest to be calculated quarterly, then find the amount after 9 months

A) ₹2329.7

B) ₹2449.7

C) ₹2249.7

D) ₹2549.7

$$\text{P} = 2000 \quad T = 9 \text{ month} \quad R \circ I = 16\% \text{ P.A}$$

$$\text{Quarterly} \rightarrow \text{P} = 2000 \quad T = \frac{3}{4} \quad R \circ I = 4\%$$

$$2000 \xrightarrow[+240]{12\% \quad 12\%} 2240$$

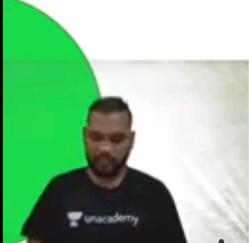




4) ₹2000 invested for 2 year 6 months at the rate of 5% half yearly on compound interest
but interest to be calculated annually, then find the amount after 2 year 6 months

- A) ₹2541 B) ₹2441 C) ₹22341 D) ₹2641

$$\begin{aligned}
 & \text{P} = 2000, T = 2 \text{ year } 6 \text{ month} \quad R \cdot F = 5\% \text{ half yearly} \\
 & \text{Annually} \rightarrow P = 2000, T = 2 \text{ year} + 6 \text{ months}, R \cdot F = 10\% \text{ pa} \\
 & 2000 \xrightarrow[2000]{\frac{2 \text{ year}}{210\%}} 2420 \quad \xrightarrow[\substack{6 \text{ months} \\ 5\%}]{} 2541
 \end{aligned}$$



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5) Find the compound interest on Rs. 16,000 at 20% per annum for 9 months, compounded quarterly

[RRB-JE]

- A) ₹ 2422 B) ₹ 2522 C) 2622 D) ₹ 2722

$$P = 16000 \quad R = 20\% \quad T = 9 \text{ months}$$

Quarterly $\rightarrow P = 16000 \quad R = 5\% \quad T = 3$

$$\begin{array}{r} \xrightarrow{\approx 15\%} \\ 16000 \xrightarrow{15\% \cdot T} +2400 \end{array}$$



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Home Work Question

What is the difference between the compound interests on Rs. 5000 for $1\frac{1}{2}$ years at 4% per annum compounded yearly and half-yearly? [VIZAG STEEL PLANT, 2015]

- A) 2.04 B) 3.04 C) 4.04 D) 5.04

$$P = 5000 \quad T = 1\frac{1}{2} \text{ year} \quad R = 4\% \text{ PA}$$

(A) $\begin{array}{r} 5000 \xrightarrow[+100]{4\% \uparrow} 5200 \xrightarrow[+104]{2\% \uparrow} 5364 \\ \text{RHS} \end{array}$

$\begin{array}{r} 5000 \xrightarrow[+100]{2\% \uparrow} 5100 \xrightarrow[+102]{2\% \uparrow} 5202 \xrightarrow[+104]{2\% \uparrow} 5306 \end{array}$



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1) ₹2000 separately invested on compound interest and simple interest at the rate of 20% per annum. What should be the difference between both interests after 2 years?

A) ₹60

B) ₹70

C) ₹80

D) NOTA

 $\underline{\underline{SI}}$

$$\underline{\underline{2000}} \xrightarrow{4.0\% \uparrow} \text{circle} \leftarrow \text{circle}$$

 $\underline{\underline{CI}}$

$$\underline{\underline{2000}} \xrightarrow{44\% \uparrow} \text{circle} \leftarrow \text{circle}$$

$$\% \text{ of } 2000 = \underline{\underline{80}}$$



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2) The difference between the compound interest compounded every six months, and the simple interest on certain sum of money at rate of 12% per annum for 1 year is ₹36, the principle is?

- A) ₹10,000 B) ₹10,100 C) ₹11,000 D) NOTA

$$\begin{aligned}
 & \text{(SP)} \quad P \xrightarrow{12\% \text{ p.a.}} \text{ } \quad \text{ } \\
 & \text{ } \quad 4 \text{ } 10000 \quad \text{ } \\
 & \text{(CI)} \quad P \xrightarrow{12.36\% \text{ p.a.}} \text{ } \quad \text{ } \\
 & \text{ } \quad 6.7167 \text{ } \quad \text{ } \\
 & \text{ } \quad 6 + 6 + \frac{36}{100} = 12.36\%
 \end{aligned}$$

$\cdot 36\% \rightarrow 36$
 $1\% \rightarrow 100$
 $100\% \rightarrow 10000$



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3) Find the difference between simple interest and compound on ₹1200 for one year at 10% per annum. Interest to be calculated half yearly?

- A) ₹4 B) ₹2 C) ₹3 D) NOTA

$$(SI) \quad 1200 \xrightarrow{10\% \text{ p.a.}} \text{?}$$

$$(CI) \quad \text{ny} + P \cdot I = S.I. \quad T=2 \\ \text{S.Y. } \frac{1}{2} \text{ S.Y. } \frac{1}{2} \Rightarrow S+S+\frac{25}{100} = 10.25\%$$

$$1200 \xrightarrow{10.25\% \text{ p.a.}} \text{?} \\ .25\% \text{ of } 1200 = 3$$



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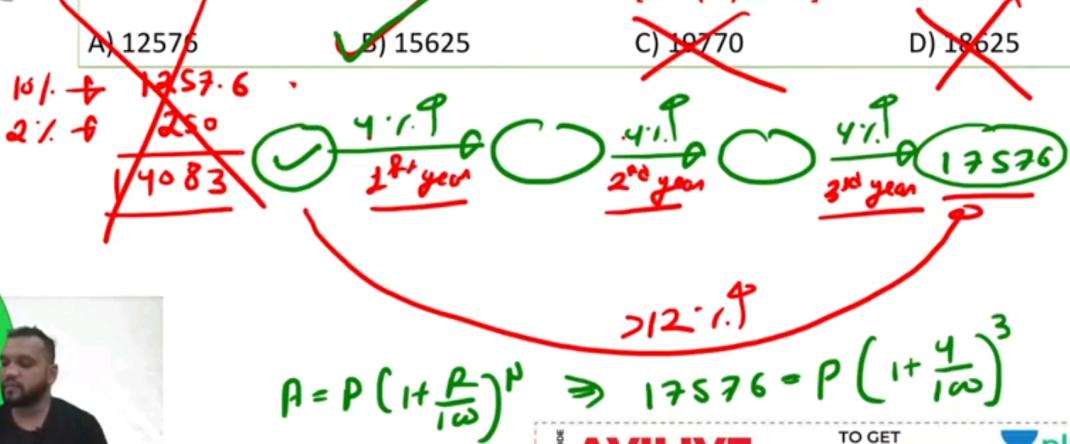
Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI

5) If the annual increase in the population of a village is 4% and the population at present is 17576, then what was the population 3 years ago?

- B) 15625

[RRB(JE)-2019]

- ~~C) 19770~~ ~~D) 18625~~



$$A = P \left(1 + \frac{R}{100}\right)^n \Rightarrow 17576 = P \left(1 + \frac{4}{100}\right)^3$$

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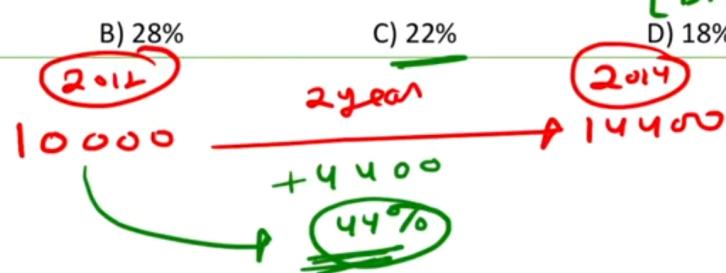
6) Population of a village is 10000 year 2012 and is 14400 in 2014. Find Compound annual growth rate?

A) 20%

B) 28%

C) 22%

D) 18%
[OMR]



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Home Work Question

The difference between simple and compound interest on a certain sum of money at 5% per annum for 2 years is ₹160. Find the sum

[VIZAG STEEL PLANT, 2015]

A) ₹ 64,000

B) ₹ 60,000

C) ₹ 40,000

D) ₹ 48,000

$$\begin{aligned}
 & \text{SI: } P \xrightarrow{10\%} \text{---} \xrightarrow{10\%} \text{---} \xrightarrow{16\%} \\
 & \text{CF: } P \xrightarrow{10.25\%} \text{---} \xrightarrow{10.25\%} \text{---} \xrightarrow{25\% \text{ of } P = 160} \\
 & 25\% \rightarrow 16000 \\
 & 100\% \rightarrow 64000
 \end{aligned}$$

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1) A man took loan from a bank at the rate of 12% p.a. simple interest. After 3 years he had to pay Rs. 5400 interest only for the period. The principal amount borrowed by him was:

A) ₹ 2000

B) ₹ 10000

C) ₹ 15000

D) ₹ 20000

$$36\% \rightarrow 5400$$

$$\left. \begin{array}{l} 4\% \rightarrow 600 \\ 100\% \rightarrow 15000 \end{array} \right\}$$

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2) A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. The sum is:

- A) ₹650 B) ₹690 C) ₹698 D) NOTA

$$\begin{array}{rcl} 698 = x & \xrightarrow[+117]{3 \text{ year}} & 815 \\ & + & \\ x & \xrightarrow[+]{4 \text{ year}} & 854 \end{array}$$

+39



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3) How much time will take for an amount of Rs. 450 to yield Rs. 81 as interest at 4.5% per annum of simple interest ?

- A) 4 year B) 2.5 year C) 3.5 year D) 2 year

$$\begin{array}{r} \text{Rs } 450 \xrightarrow{\text{4.5\%}} \\ \text{2 years} \xrightarrow{\text{9\%}} \frac{45}{45} \\ \text{4 years} \xrightarrow{\text{18\%}} \underline{\underline{81}} \end{array}$$



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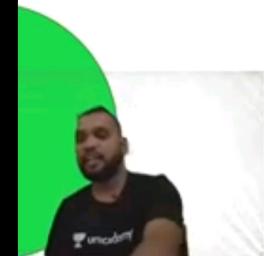


3) How much time will take for an amount of Rs. 450 to yield Rs. 81 as interest at 4.5% per annum of simple interest ?

- A) 4 year B) 2.5 year C) 3.5 year D) 2 year

$$\frac{81}{450} \times 100 = 18\%$$

$$\begin{aligned} \text{Rs. } 450 &\xrightarrow{4.5\%} \\ 2 \text{ years} &\xrightarrow{9\%} \frac{45}{40.5} \\ 4 \text{ years} &\xrightarrow{18\%} \underline{\underline{81}} \end{aligned}$$



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4) A certain sum of money amounts to Rs 1008 in 2 years and to Rs 1164 in 3 $\frac{1}{2}$ years. Find the sum and the rate of interest.

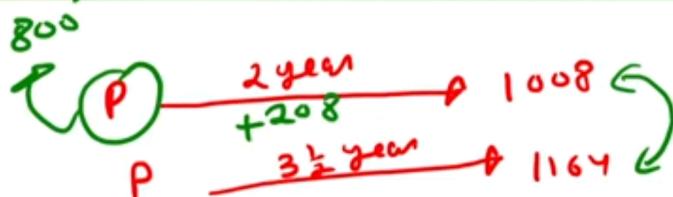
A) ₹800, 14%

B) ₹800, 13%

C) ₹800, 12%

D) NOTA

*SI



$$\begin{aligned} R \cdot I &= \frac{104}{89P} \times 14 \\ &= 137 \end{aligned}$$

1 $\frac{1}{2}$ year \rightarrow 156
3 years \rightarrow 312
14 years \rightarrow 104

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5) In how many years will a sum of Rs.800 at 10% per annum compounded semi annually become Rs.926.10

A) 1.5

B) 2.5

C) 3.5

D) 4.5

$$P = 800 \quad R \text{ of } I = 10\% \text{ PA} \quad A = 926.10$$

$$\underline{\underline{H}} \rightarrow P = 800 \quad R \text{ of } I = 5\% \quad A = 926.10$$

$+126.1$
 $\geq 15\%$



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**Aptitude for GATE/ESE/PSUs/AE/JE/College Placement, Topic- SI & CI**

6. A sum was put at simple interest at a certain rate for 3 years. Had it been put at 2% higher rate, it would have fetched Rs 360 more. Find the sum.

A) 4000

B) 5000

C) 6000

D) 9000

$$\begin{aligned} P &\xrightarrow[2\%]{3 \text{ year}} A \\ P &\xrightarrow[2\%+2\%]{3 \text{ year}} A + 360 \\ 6\% &\rightarrow 360 \\ 1\% &\rightarrow 60 \\ 100\% &\rightarrow 6000 \end{aligned}$$

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7) Find Simple Interest on Rs 6250 at 14% per annum for 146 days.

A) 350

B) 450

C) 550

D) 650

$$\frac{6250}{+ 875} \xrightarrow{14\% \text{ PA}}$$

$$\begin{array}{l} 10\% \rightarrow 625 \\ 1\% \rightarrow 62.5 \\ 4\% \rightarrow 250 \end{array}$$

$$\begin{array}{l} 1 \text{ year} \rightarrow 875 \\ 365 \rightarrow 875 \end{array}$$

$$\begin{array}{l} 1 \rightarrow \frac{875}{365} \\ 146 \rightarrow \frac{875}{365} \times 146 \end{array}$$

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Q) How long will it take for a sum of money to grow from Rs.1250 to Rs.10,000, if it is invested at 12.5% p.a simple interest?

- A) 65 year B) 56 year C) 45 year D) 57 year

$$\begin{array}{r} 1250 \\ \xrightarrow[+ 8750]{700\% \cdot T} 10,000 \\ \hline \end{array}$$

$\frac{700}{12.5} = 56$

$$\frac{875}{12.5} \times 4 = 175 \times 4 = 700\% \cdot T$$

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✓ A sum of Rs. 12,500 amounts to Rs. 15,500 in 4 years at the rate of simple interest. What is the rate of interest?

- A) 3% B) 4% C) 5% D) 6%

$$\begin{array}{ccc} 12500 & \xrightarrow[4 \text{ years}]{+3000} & 15500 \\ & \text{+} 3000 & \\ & \xrightarrow[750 \rightarrow 1 \text{ year}]{\text{Interest}} & \end{array}$$



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✓ A sum of Rs. 12,500 amounts to Rs. 15,500 in 4 years at the rate of simple interest. What is the rate of interest?

- A) 3% B) 4% C) 5% D) 6%

$$\begin{array}{ccc} 12500 & \xrightarrow[4 \text{ year}]{} & 15500 \\ & +3000 & \\ \hline 750 & \xrightarrow{144} & 75 \rightarrow 1 \text{ year interest} \\ \frac{30}{5} = 6\% & & \end{array}$$

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