COMPOUND INTEREST

SI

P	r	t
100	10%	2 yr

I	II
10	10

20 SI 2 yr

III
10

30

2 yr = 20%.

CI

P	r	t
100	10%	2 yr

	I	II	III
I	10	10+1	11 + 1.1
		11	12.1

21

33.1

$2\,yr = a + b + \frac{ab}{100}$

$= 10 + 10 + \frac{10 \times 10}{100} = 21\%$

II- $P = 100$, $r = 10\%$, $t = 2yr$

$$\frac{\overset{1}{100}}{\cancel{110}} \times \frac{\overset{2}{\cancel{100}}}{\cancel{110}} = \frac{100}{121} \begin{matrix} - \text{ Sum-P} \\ - \text{ Amount. A} \end{matrix} \Big) \; CI = A - P = 21$$

$P = 100$, $r = 10\%$ $t = 3yr$

$$\frac{\overset{1}{100}}{\cancel{110}} \times \frac{\overset{2}{\cancel{100}}}{\cancel{110}} \times \frac{\overset{3}{\cancel{100}}}{\cancel{110}} = \frac{1000}{1331} \begin{matrix} - \text{ Sum-P} \\ - \text{ Amount. A} \end{matrix} \Big) \; CI = 331$$

$1000 \Rightarrow 100$

$CI = 331 \Rightarrow 33.1$

$A = 1331 \Rightarrow 133.1$

III - $P = 100$, $r = 10\%$, $t = 2yr$ when r is given

$r = 10\% = \frac{10}{100} = \frac{1}{10}$

$$P \xrightarrow[\times 2]{1yr} A$$

$$10 \xrightarrow[\times 2]{1yr} 11$$

$$100 = 10^2 \xrightarrow{2yr} 11^2 = 121$$

$100 \qquad 121$

$CI = 21$

3 yr

$$P \xrightarrow[\times 3]{1yr} A$$

$$10 \xrightarrow[\times 3]{1yr} 11$$

$$P \qquad A$$

$$1000 = 10^3 \xrightarrow{3yr} 11^3 = 1331$$

$1000 \qquad 1331$

$100 \qquad 133.1$

$CI = 33.1$

Compounded half yearly

$r = \frac{r}{2}\%$ $t = 2t$

Compounded quarterly

$r = \frac{r}{4}\%$ $t = 4t$

Formula

$$A = P\left[1+\frac{R}{100}\right]^{t}$$

$$CI = A - P = P\left(1+\frac{R}{100}\right)^{t} - P$$

$$= P\left[\left(1+\frac{R}{100}\right)^{t} - 1\right]$$

$10^2 = 100$ $10^3 = 1000$ $10^4 = 10000$

$11^2 = 121$ $11^3 = 1331$ $11^4 = 14641$

$20^2 = 400$ $20^3 = 8000$

$21^2 = 441$ $21^3 = 9261$

$25^2 = 625$ $25^3 = 15625$

$26^2 = 676$ $26^3 = 17576$ $27^2 = 729$

$50^2 = 2500$ $51^2 = 2601$

$3^4 = 81$ $8^3 = 512$ $8^4 = 4096$, $2^{10} = 1024$

firmes ou itself

t = ?

Rs. x

% x

P :- ?

$$P \xrightarrow{X \text{ -} YY} A_1 \xrightarrow{Y \text{ -} YY} A_2$$

SI - Sap same ✓
diff ✓

?

CI : gap - same ✓

$$P \xrightarrow{X \text{ -} YY} A_1 \xrightarrow{X \text{ -} YY} A_2$$

a : b : b

a : b

When gap same, ratio also same
(year)

In CI. When r% is asked - make the gap 1 year

$P \xrightarrow{x\,\%} A_1 \xrightarrow{y-y\%} A_2$ 10 11

$x \neq y$ $r = ?$

A_1 A_2

2

$P \times \frac{x}{100} = A_1 \times x/100 = A_2 \times x/100 = A_3$ $r = \frac{2}{A} \times 100$

When r is asked, make the Sap into one year

CI

Given: P, A, t $\qquad r: ?$

$$P \xrightarrow[\times 1/t]{t\ yr} A$$

$$x^{t \times 1/t} : y^{t \times 1/t}$$

$$P : A = a : b$$

$$\downarrow \quad \downarrow$$

$$x^t : y^t$$

$$P : A = x^2 : y^2$$

$$P \xrightarrow[2/2]{2\ yr} A$$

When r is different for each year

When t is in mixed fraction

	I	II	III
$r =$	10%	20%	30%

$$\frac{100}{110} \times \frac{100}{120} \times \frac{100}{130} = \frac{x}{y} = \frac{P}{A}$$

$2\frac{1}{2}$ $\quad$ 2 $\quad$ $\frac{1}{2}$

10% $\quad$ 5%

$$\frac{100}{110} \times \frac{100}{110} \times \frac{100}{105}$$

SI & CI

Diff

P = 100 r = 10% /yr

SI

I	II	Total
10%	10%	20%

30

CI

I	II
10%	10% + 1
	11%

Total 21%

1% → 100 × 1 / 100 = 1 Rs

III

10% 11% 11 + 1.1 = 12.1 % 11 × 10 / 100 = 1.1

33.1

What will be the compound interest on a sum of ₹1200 for 2 years at the rate of 20% per annum when the interest is compounded yearly?

1. ₹624
2. ₹504
3. ₹576
4. ₹528 ✔

P = 1200 t = 2 yr r = 20% = $\frac{1}{5}$ - CI

P = 5 $\xrightarrow{1\,yr}$ A = 6

)×2

P = $25 = 5^2$ $\xrightarrow{2\,yr}$ A = $6^2 = 36$

1200

CI = 11 : ?

$11 = \frac{\cancel{1200}^{\cancel{240}}}{\cancel{25}_{\cancel{5}}} \times 11 = 48 \times 11 = 528$

48

$$\begin{array}{r} 48 \\ 11 \\ \hline 48 \\ 48 \\ \hline 528 \end{array}$$

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A sum of ₹900 is invested at compound interest (compounded annually) for 2 years. If the rate of interest is 10% per annum, then what will be the amount?

A: ?

1. ₹1071
2. ₹1089
3. ₹1289
4. ₹1121

P: 900 t: 2 yr r: 10% = $\frac{1}{10}$ — CI A: 11

P A

10 $\xrightarrow[\times 2]{1\,yr}$ 11

P A

$100 = 10^2 \xrightarrow{2\,yr} 11^2 = 121$

900

$121 = \frac{900}{100} \times 121 = 1089$

$$\begin{array}{r} 121 \\ 9 \\ \hline 1089 \end{array}$$

A sum of ₹ 5000 is invested for two years under compound interest at 10% p.a, interest being compounded annually. The interest earned (in ₹) is:

CI : ?

1. 2100
2. 1000
3. 1050
4. 500

P = 5000 t = 2 YY r = 10% = $\frac{1}{10}$ - CI A = 11

P A

10 $\xrightarrow{1YY}$ 11

)x2 A

$100 = 10^2 \xrightarrow{2YY} 11^2 = 121$

5000

CI = 21 = $\frac{5000}{100} \times 21 = 1050$

₹20000 is invested on compound interest (compounded half yearly) at the rate of 20% per annum, then what will be the interest after two years?

1. ₹8800
2. ₹8824
3. ₹9282
4. ₹9428

CI = ? P = 20000 $r = \frac{r}{2} = \frac{20}{2} = 10\% = \frac{1}{10}$

$t = 2 \text{ yr} \times 2 = 4 \text{ yr}$ 6 (I) 6 (II) 6 (III) 6 (IV)

$10 \xrightarrow[\times 4]{1 \text{ yr}} 11$

P

$10000 = 10^4 \xrightarrow{4 \text{ yr}} 11^4 = 14641$

$\times 2 \downarrow$

20000

CI = 4641 × 2 = 9282

A sum of ₹1200 is invested at compound interest (compounded half yearly). If the rate of interest is 10% per annum, then what will be the amount after 18 months?

1. ₹1389.15 ✓
2. ₹1185.45
3. ₹1563.25
4. ₹1295.35

P = 1200

A = ?

$r = r/2 = \frac{10}{2} = 5\% = \frac{5}{100} = \frac{1}{20} = 1/20$

t = 18 months = 1.5 yrs × 2 = 3 yrs

I II III

6 6 6

$20 \xrightarrow{1 \times r} 21$

$\times 3$

$P \quad 3\text{ yr} \quad A$

$8000 = 20^3 \xrightarrow{3\text{ yr}} 21^3 = 9261$

1200

$9261 = \frac{1200}{8000} \times 9261$

8 1.5

20

10

9261

15

46305

9261

1389.15

1389.15 ✓

How much will a principal of ₹5000 invested on compound interest (compounded annually) amount to, in three years at a rate of 50% per annum?

1. ₹16,375
2. ₹11,250
3. ₹16,875
4. ₹17,275

P: 5000 A: ? t: 3 yr r: 50% = 1/2 - CC

P → A

2 —1 yr→ 3

)x3

625
27
4375
1250
16875

P → A

$8 = 2^3 \xrightarrow{3\,yr} 3^3 = 27$

5000 → 625

$27 = \frac{5000}{8} \times 27$

A = 16875

What is the compound interest on ₹5000 in 2 years at the rate of 20% per annum? (interest compounded half yearly)

1. ₹2340.50
2. ₹2275.50
3. ₹2290.50
4. ₹2320.50 ✓

CI : ? P : 5000 t : 2yr × 2 : 4 r : $\frac{20\%}{2}$: 10% = $\frac{1}{10}$

P → A

10 $\xrightarrow{1yr}$ 11

)×4

P → A

10000 = 10^4 $\xrightarrow{4yr}$ 11^4 = 14641

÷2

5000

CI : $\frac{\cancel{4641}\ 2320.5}{\cancel{2}}$ = 2320.5

A sum becomes Rs. 1,352 in 2 years at 4% per annum compound interest. The sum is

(a) Rs. 1,225 (b) Rs. 1,270

(c) Rs. 1,245 (d) Rs. 1,250

A = 1352 t = 2 yr

r = 4% = 4/100 = 1/25 - CI

P = ?

P → A

25 —1 yr→ 26

×2

P → A

625 = 25^2 —2 yr→ 26^2 = 676

×2 ×2

1250 1352

The principal, which will amounts to Rs. 270.40 in 2 years at the rate of 4% per annum compound interest, is:

(a) Rs. 200 (b) Rs. 225

(c) Rs. 250 (d) Rs. 220

$A = 270.4$ $t = 2$ yr

$r = 4\%$ $P = ?$

$4\% = \frac{4}{100} = \frac{1}{25}$

$25 \xrightarrow[\times 2]{1\text{ yr}} 26$

P

$625 = 25^2 \xrightarrow{2\text{ yr}} 26^2 = 676$

$\downarrow$

270.4

$\downarrow$

?

$625 = \frac{\cancel{270.4}^{\,2}}{\cancel{6760}_{\,1352}} \times \cancel{625}^{\,125}$

$P = 250$

The compound interest on Rs. 16,000 for 9 months at 20% per annum, interest being compounded quarterly, is:

(a) Rs. 2,520 (b) Rs. 2,524

(c) Rs. 2,522 (d) Rs. 2,518

CI : ? P = 16000

t : 9 months r = 20/4

3 3 3 = 5%

I II III = 5/100 = 1/20

3 yr

1 yr : 3 month

20 $\xrightarrow{1 yr}$ 21

)×3

P A

8000 = 20^3 $\xrightarrow{3 yr}$ 21^3 = 9261

×2

16000 CI = 1261 $\xrightarrow{\times 2}$ 2522

A certain sum amounts to Rs. 5,832 in 2 years at 8% per annum compound interest, the sum is:

(a) Rs. 5,000 (b) Rs. 5,200

(c) Rs. 5,280 (d) Rs. 5,400

P = ? A = 5832

t = 2 yr r = 8%

$= \frac{8 \times 2}{100} = \frac{2 - CI}{25 - P}$

25 $\xrightarrow[\times 2]{1 \times r}$ 27

P

$625 = 25^2 \xrightarrow{2 \times r} 27^2 = 729$ A

$\downarrow \times 8$ $\downarrow \times 8$

5000 5832

729

8

5832

7 2

625

8

5000

2

4

A certain sum of money yields Rs. 1261 as compound interest for 3 years at 5% per annum. The sum is:

(a) Rs. 9000 (b) Rs. 8400

(c) Rs. 7500 (d) Rs. 8000

A certain sum, invested at 4% per annum compound interest, compounded half yearly, amounts to Rs. 7,803 at the end of one year. The sum is: P=?

(a) Rs. 7,000 (b) Rs. 7,200

(c) Rs. 7,500 (d) Rs. 7,700

$r = \frac{4\%}{2} = 2\% = \frac{2}{100} = \frac{1}{50}$

A = 7803 t = 1yr × 2 = 2yr
6 6

50 $\xrightarrow{1yr}$ 51
)×2

P A

2500 = 50^2 $\xrightarrow{2yr}$ 51^2 = 2601

×3 ×3

7500 7803

An amount of Rs. 6,000 lent at 5% per annum compound interest for 2 years will become

(a) Rs. 600 (b) Rs. 6,600

(c) Rs. 6,610 (d) Rs. 6,615

A = ? P = 6000

r = 5% = 5/100 = 1/20

t = 2 yr

20 —1 yr→ 21

×2

P

600 = 20² —2 yr→ 21² = 441 A

×15 ↓ 6000

×15 ↓ 5

A man invests Rs. 2000 at 5% compound interest. At the end of 3 years he will have :

(a) Rs. 2316.25 (b) Rs. 2305

(c) Rs. 2205 (d) Rs. 2315.25

(SSC MTS Exam 10.03.2013)

What will be the compound interest on a sum of ₹31250, at 12% compound interest (interest compounded yearly) in $2\frac{2}{3}$ years?

CI: ? P r t

1. ₹11048
2. ₹11096
3. ₹11068
4. ₹11086 ✓

$t = 2 \text{ yr} + \frac{2}{3} \text{ yr}$

$\cancel{12} \times \frac{2}{\cancel{3}} = 8\%$

I	II	III
12%	12%	8%

31250 $\xrightarrow{\times 2}$ 15625 − P

$\frac{\cancel{100}^{25}}{\cancel{112}_{28}} \times \frac{\cancel{100}^{25}}{\cancel{112}_{28}} \times \frac{\cancel{100}^{25}}{\cancel{108}_{27}} = \frac{15625}{21168}$ − P

625 × 25

28 × 28 = 784 × 27

5488

1568

21168

21168 − 15625 = 5543 (CI)

5543 × 2 = 11086

The compound interest on Rs. 6,000 at 10% per annum for $1\frac{1}{2}$ years, when the interest being compounded annually, is :

(a) Rs. 910 (b) Rs. 870

(c) Rs. 930 (d) Rs. 900

CI : ?

P = 6000, r = 10% t = 1½

1 yr ½ yr

10% 5%

$\frac{100}{110} \times \frac{105}{105} = \frac{200}{231}$ — P, A CI 31

200 → 6000

$31 = \frac{6000}{200} \times 31 = 930$

The compound interest on a certain sum at 15% p.a. compounded yearly for $2\frac{1}{3}$ years is ₹9327. The sum is:

1. ₹24000
2. ₹25000
3. ₹20000
4. ₹27000

r: 15% t: 2 1/3

2 yrs 1/3 yr

$r_{1/3} = 15 \times \frac{1}{3} = 5\%$

I	II	III
15%	15%	5%

$\frac{20}{100} \times \frac{20}{115} \times \frac{20}{105} = \frac{8000}{11109}$ – A

CI 3109 ↓ ×3 9327

$23^2 = 529$

529×21

529

1058

11109

8000 × 3 = 24000

The compound interest (compounded annually) on a sum of money invested for two years is ₹10125. If the rate of interest is 25% per annum, then what is the amount after these two years?

1. ₹28125
2. ₹32275
3. ₹30625
4. ₹26275

CI = 10125 r = 25% t = 2 yr A = ?

$= \frac{1}{4}$

$25 = \frac{10125}{9} \times 25$

1125

$4 \xrightarrow{1\,yr} 5$

P $\xrightarrow{2\times2}$ A

$16 = 4^2 \xrightarrow{2\,yr} 5^2 = 25$

CI = 9 ⇒ 10125

25 = ?

A = 28,125

1125
25
5625
2250
28,125

The compound interest on Rs. 8,000 at 15% per annum for 2 years 4 months, compounded annually is:

(a) Rs. 2980 (b) Rs. 3091

(c) Rs. 3109 (d) Rs. 3100

CI = ?

2 yr + 4 months

$\frac{5}{3} \times \frac{1}{3} = 5\%$

2 yr + $\frac{4}{12}$ yr = 2 yr + $\frac{1}{3}$ yr

I	II	III
15%	15%	5%

P = 8000

$\frac{100}{115} \times \frac{100}{115} \times \frac{100}{105} = \frac{8000}{11109}$

20 20 20

23 23 21

8000

CI

3109

3109

A sum becomes 8 times of itself in 7 years at the rate of compound interest (interest is compounded annually). In how many years will the sum becomes 4096 times of itself?

1. 56
2. 28
3. 24
4. 16

1 $\xrightarrow{7 \text{ yr}}$ 8

$\times 4$

28 $\rightarrow$ 4096 $= 8^4$

$8^3 = 512$

8^4 8

4096

28 yr

A sum of money becomes 3 times in 10 years at the rate of compound interest (compounded annually). In how many years will it become 81 times?

1. 40 years ✓
2. 50 years ✗
3. 35 years ✗
4. 30 years ✗

P A

$1 \xrightarrow{10\,yr} 3$

$\times 4$

$3^2 = 9 \quad 3^3 = 27 \quad 3^4 = 81$

$1^4 \xrightarrow{40\,yr} 81 = 3^4$

cort

A sum doubles in 4 years at a certain rate of compound interest. In how many years does it amount to 8 times itself at the same rate?

1. 9
2. 12
3. 15
4. 6

P x A ½ x t = ?

1 —4 yr→ 2

×3

1³ —12 yr→ 8 = 2³

Ans: 12 yr

A sum borrowed under compound interest doubles itself in 10 years. When will it become fourfold of itself at the same rate of interest?

1. 40 years

2. 15 years

3. 24 years

4. 20 years

$1 \xrightarrow{10\,yr} 2$

$\times 2$

$1^2 \xrightarrow{20\,yr} 4 = 2^2$

In a Company, number of engineers doubles itself in every 2 years. In how much time will the number of engineers become 1024 times of its original number?

1. 12 years
2. 20 years
3. 15 years
4. 24 years

$1 \xrightarrow{2\times 2} 2$

$\times 10$

$2^{10} = 1024$

$1^{10} \xrightarrow{20\times 1} 1024 = 2^{10}$

A sum of money doubles itself in 4 years compound interest. It will amount to 8 times itself at the same rate of interest in:

(a) 18 years (b) 12 years

(c) 16 years (d) 24 years

$1 \xrightarrow{4 \times 4} 2$

$\times 3$

$1^3 \xrightarrow{12 \times 4} 8 = 2^3$

A sum of money becomes eight times of itself in 3 years at compound interest. The rate of interest per annum is:

(a) 100% (b) 80%

(c) 20% (d) 10%

$3 \times 1/3 = 1$

$r = ?$

$1 \xrightarrow[1 \times 1/3]{3 \times r} 8$

$1 = 1^{1/3} \xrightarrow{1 \times r} 8^{1/3} = 2$

$8^{1/3} = 2^{3/3}$

$1 \xrightarrow{1 \times r} 2$

$CI = 1$

100%.

At what rate percent per annum of compound interest, will a sum of money become four times of itself in two years?

(a) 100% (b) 75%

(c) 50% (d) 20%

$r = ?$

P A

$1 \xrightarrow{2 \times r} 4$

$1^2 \xrightarrow{2 \times r} 2^2$

$\times 1/2$

$1^{2 \times 1/2} \xrightarrow{1 \times r} 2^{2 \times 1/2}$

P A

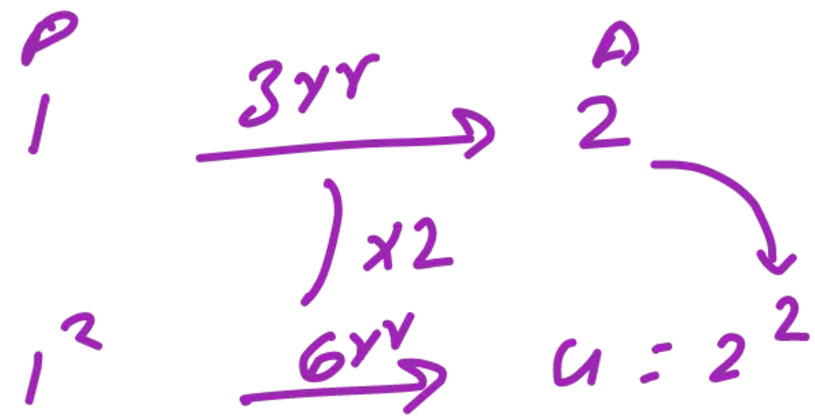
$1 \xrightarrow{1 \times r} 2$

$\frac{1}{1} \times 100 = 100\%$

A sum of money becomes double in 3 years at compound interest compounded annu- ally at the same rate. In how many years will it become four times of itself?

(a) 4 years (b) 6 years

(c) 6.4 years (d) 7.5 years



A sum of money becomes eight times in 3 years, if the rate is compounded annually. In how much time will the same amount at the same compound rate become sixteen times?

(a) 6 years (b) 4 years

(c) 8 years (d) 5 years

(SSC MTS Exam 27.02.2011)

$1^3 = 1 \xrightarrow{3\,yr} 8 = 2^3$

$1^4 \xrightarrow{4} 16 = 2^4$

$1^3 \xrightarrow[\times 1/3]{3\,yr} 2^3$

$2^{3 \times 1/3}$

$1 \xrightarrow{1\,yr} 2$

$1^4 \xrightarrow[4\,yr]{\times 4} 2^4 = 16$

A sum of ₹2400 becomes ₹3600 in 6 years at a certain rate of compound interest (compounded annually). What will be the amount after 12 years at the same rate of interest?

1. ₹6000
2. ₹4800
3. ₹5400
4. ₹4500

12 yr

P → 6 yr → A_1 → 6 yr → $A_2 = ?$

2400 → 3600 → ?

2 : 3 : 3

2400 : 3600

2 : 3

2 ⇒ 3600

$3 = \frac{3600}{2} \times 3 = 5400$

1800

A sum invested at compound interest (compounded annual) amounts to ₹750 at the end of first year and ₹900 at the end of second year. What is the sum?

1. ₹700
2. ₹625
3. ₹600
4. ₹650

P = ?

$P \xrightarrow{1YY} \underset{A_1}{750} \xrightarrow{1YY} \underset{A_2}{900}$

$P \xrightarrow{2YY} 900$

5 : 6

5 : 6

750 : 900

5 : 6

625

6 => 150

$5 = \frac{\cancel{750}^{125}}{\cancel{6}} \times 5 = 625$

exammix

A sum of money invested at compound interest amounts to Rs. 650 at the end of first year and Rs. 676 at the end of second year. The sum of money is:

(a) Rs. 600 (b) Rs. 540

(c) Rs. 625 (d) Rs. 560

$P \xrightarrow{1\,yr} \overset{A_1}{650} \xrightarrow{1\,yr} 676$

$25 : 26$

$25 : 26$

$\cancel{650} : \cancel{676}$

$\cancel{325} : \cancel{338}$

$25 : 26$

$25 = \frac{\cancel{650}^{\,25}}{\cancel{26}_{\,2}} \times 25$

$= 625$

A sum becomes Rs. 4500 after two years and Rs. 6750 after four years at the same rate of compound interest. The sum is:

(a) Rs. 4000 (b) Rs. 2500

(c) Rs. 3000 (d) Rs. 3050

$P \xrightarrow{2\,yr} 4500 \xrightarrow{2\,yr} 6750$

2 : 3

2 : 3

1500

$2 = P = \frac{4500}{3} \times 2 = 3000$

4500 : 6750

90 : 135

10 : 15

2 : 3

An amount of money appreciates to Rs. 7,000 after 4 years and to Rs. 10,000 after 8 years at a certain compound interest compounded annually. The initial amount of money was

(a) Rs. 4700 (b) Rs. 4900

(c) Rs. 4100 (d) Rs. 4300

$P \xrightarrow{4\ yr} 7000 \xrightarrow{4\ yr} 10000$

$7 : 10$

$7 : 10$

$10 = 7000$

$7 = \frac{7000}{10} \times 7 = 4900$

An amount of money at compound interest grows up to Rs. 3,840 in 4 years and up to Rs. 3,936 in 5 years. Find the rate of interest.

(a) 2.5% (b) 2%

(c) 3.5% (d) 2.05%

$r = ?$

$$\begin{array}{r} 3936 \\ 3840 \\ \hline 96 \end{array}$$

$$P \xrightarrow{4\,yr} 3840 \xrightarrow{1\,yr} 3936$$

$$\xrightarrow{5\,yr}$$

$CI = 96$

$$r = \% = \frac{96}{3840} \times 100 = 2.5\%$$

A certain amount of money at r% compounded annually after two and three years becomes Rs. 1440 and Rs. 1728 respectively. r% is

(a) 5 (b) 10

(c) 15 (d) 20

$$\begin{array}{r} 1728 \\ 1440 \\ \hline 288 \end{array}$$

$$P \xrightarrow{2yr} 1440 \xrightarrow{1\ yr} 1728$$

CI: 288

r: ?

$$r\% = \% = \frac{\overset{2}{\cancel{288}}}{\cancel{1440}} \times 100 = 20\%$$

The compound interest on a certain sum for two successive years are Rs. 225 and Rs. 238.50. The rate of interest per annum is:

$r = ?$

(a) $7\frac{1}{2}\%$ (b) 5% (c) 10% (d) 6%

$P \xrightarrow{1\text{ yr}} 225 \xrightarrow{1\text{ yr}} 238.50$

CI = 13.5

$r\% = \% = \frac{135}{2250} \times 100 = 3 \times 2 = 6\%$

A man invested a sum of money at compound interest. It amounted to ₹12100 in two years and to ₹13310 in three years. The rate of interest per annum is:

1. 11%
2. 9.5%
3. 12.5%
4. 10%

$r = ?$

A_1 A_2

$P \xrightarrow{2\text{ yr}} 12100 \xrightarrow{1\text{ yr}} 13310$

CI = 1210

13310
12100
1210

$r\% = \frac{1210}{12100} \times 100 = 10\%$

A sum of money on compound interest amounts to Rs. 10648 in 3 years and Rs. 9680 in 2 years. The rate of interest per annum is:

r = ?

(a) 5% (b) 10%

(c) 15% (d) 20%

$$\begin{array}{r} 10648 \\ 9680 \\ \hline 968 \\ \hline \end{array}$$

$$r = \frac{968}{9680} \times 100 = 10\%$$

$$P \xrightarrow{2\,yr} 9680 \xrightarrow{1\,yr} 10648$$

CI = 968

A sum of money amounts to Rs. 4,840 in 2 years and to Rs. 5,324 in 3 years at compound interest (compounded annually). The rate of interests per annum is: r: ?

(a) 10% (b) 9%

(c) 11% (d) 8%

$P \xrightarrow{2\,yr} 4840 \xrightarrow{1\,yr} 5324$

484

5324
4840
484

$r: \frac{484}{4840} \times 100$

= 10%

A certain sum of money amounts to Rs. 2,420 in 2 years and Rs. 2,662 in 3 years at same rate of compound interest, compounded annually. The rate of interest per annum is:

(a) 6% (b) 8%

(c) 9% (d) 10%

$P \xrightarrow{2Y} 2420 \xrightarrow{1Y} 2662$

242

$r = ?$

2662

2420

242

$\frac{242}{2420} \times 100 = 10\%$

A sum of ₹ 10,000 is lent partly at 8% and remaining at 10% per annum. If the yearly interest on the average is 9.2%, the two parts are:

(a) ₹ 4000, ₹ 6000

(b) ₹ 4500, ₹ 5500

10000 — 9.2%

2 x y 3

8% 10%

I II

8% 10%

9.2%

0.8 1.2

8 : 12

2 : 3 = 5

5 = 10000

2000

1 = ~~1000~~ 5

2 = 4000

3 = 6000

P: 10000

①

10% 20%

Total-IN: 300

12

20

1 2

30

25

2 : 3 = 5 =

5 : 5

A sum of ₹ 1550 was lent partly at 5% and partly at 8% simple interest. The total interest received after 3 years is ₹ 300. The ratio of money lent at 5% to that at 8% is:

(a) 5 : 8 (b) 8 : 5

(c) 31 : 6 (d) 16 : 15

3 yr → 300

1 yr → 100

P

1550 $\xrightarrow{1\,yr}$ 100

r% 31

100 = $\frac{1550 \times r \times 1}{100}$

2

r = $\frac{200}{31}$ %

(2)

$P: 10000 \xrightarrow{9.2\%} 10000 \times \frac{92}{100} = 920$ SI

$8\% \quad 8\% + 12\%$

$4000 \quad = 6000$

$8\% = \frac{10000 \times 8}{100} = 800 + 120$

II $2\% = 120$

$100\% = \frac{120}{2} \times 100 = 6000$

A sum of ₹10000 is invested in three schemes of simple interest. The annual interest rates are respectively, 4%, 6% and 10%. ₹4000 were invested in the first scheme. If the total interest earned after five years is ₹2800, then how much money was invested in the third scheme?

1. ₹1500
2. ₹5000
3. ₹1000
4. ₹3000

10000 $\xrightarrow{5y}$ 2800

4000 → 1y → 560 − 160

6000 $\xrightarrow{1y}$ 400

560
2800
8

$\frac{4000 \times 4}{100} = 160$

$400 : \frac{6000 \times y \times 1}{100}$

$y : \frac{20}{3}\%$

18% 30%

20%

10 : 2

6% 10%

$\left(\frac{20}{3}\%\right)$

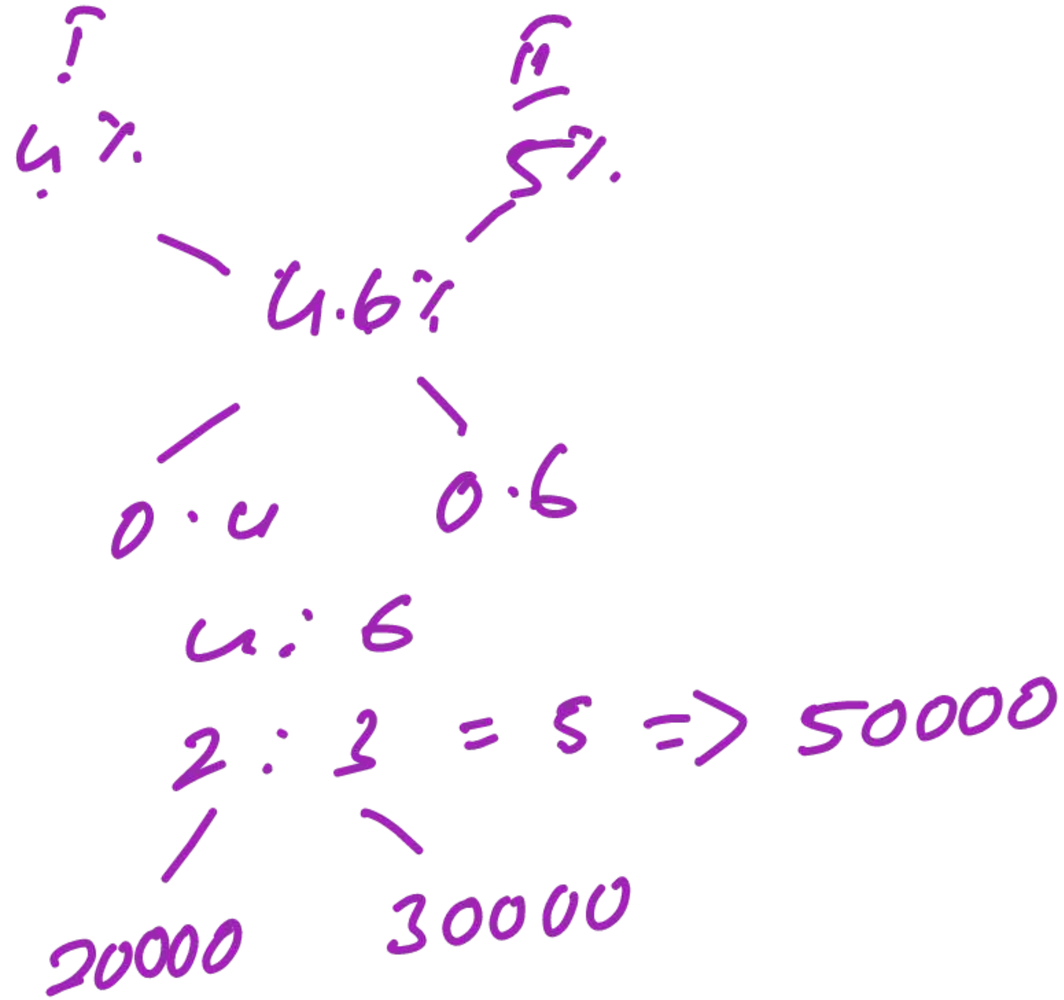
5 : 1 = 6 ⇒ 6000

5 − 5000

1 − 1000

A sum of ₹50,000 is lent partly at 4% and remaining at 5% per annum. If the yearly simple interest on the average is 4.6%, the two parts are:

1. ₹22500, ₹27500
2. ₹15000, ₹35000
3. ₹20000, ₹30000
4. ₹25000, ₹25000



I	II
5% ×31	8% ×3

$\left(\frac{200}{31}\%\right)$

I	II
155%	208%

200%

48 : 45

16 : 15

A sum of ₹ 10000 is lent partly at 8% and remaining at 10% per annum. If the yearly interest on the average is 9.2%, then both parts are respectively.

1. ₹ 5500 and ₹ 4500
2. ₹ 4500 and ₹ 5500
3. ₹ 5000 and ₹ 5000
4. ₹ 4000 and ₹ 6000

I 8% II 10%

9.2%

0.8 1.2

8 : 12 ×2

2 : 3 = 5 ⇒ 10000

×2 ↓ ↓

4000 6000

②

$1550 \xrightarrow[\text{whole}]{1\%} 100$

5% — 800

$5\% + 3\%$ — 750

77.5

$1550 \times \frac{8}{100} = 77.5 + 22.5$

2

$3\% = 22.5$ 75

$100\% = \frac{225}{3 \times 10} \times 100\% = 750$

I	:	II
800	:	750
16	:	15

A certain sum amounts to ₹20720 in four years and ₹24080 in six years at a certain rate of simple interest. The sum (in ₹) is:

1. 11000
2. 12000
3. 14000
4. 15000

$14000 \xrightarrow{6YY} 24080$

$P \xrightarrow[4YRS]{r\%} 20720 \xrightarrow[2YY]{r\%} 24080$

6720

$2YY = 3360$

$4YY = 6720$

24080
20720
3360

20720
6720
14000

www.

P: 50000 $\xrightarrow[1\,Yr]{4.6\%}$ $50000 \times \frac{4.6}{100} = 2300$

4% | 4% + 1%

I | II → 30000

20000

$4\% = 50000 \times \frac{4}{100} = 2000 + 300$

II 1% : 300

100% : 30000

$\begin{array}{r} 46 \\ 5 \\ \hline 230 \end{array}$ 3

A sum becomes ₹500 in 5 years and ₹600 in 7 years at a certain rate percent p.a at of simple interest. What is the sum?

1. ₹300
2. ₹400
3. ₹200
4. ₹250

7-yr

250 P $\xrightarrow[5yr]{r\%}$ A_1 500 $\xrightarrow{2yr}$ A_2 600

250

SI

2yr = 100 SI

1yr = 50

5yr = 50×5 = 250

A certain sum of money amounts to ₹ 756 in 2 years and to ₹ 873 in $3\frac{1}{2}$ years at a certain rate of simple interest. The rate of interest per annum is

(a) 10% (b) 11%

(c) 12% (d) 13%

600 A

P $\xrightarrow{2yr}$ 756 $\xrightarrow{3/2\ yr}$ 873

156 SI 117

$\frac{3}{2}$ yr = 39

$2yr = \frac{117}{3} \times 2 \times 2$

$= 156$

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

$156 = \frac{600 \times r \times 2}{100}$

13

26

$r = 13\%$

$P = 10000 \xrightarrow{9.2\%} 10000 \times \frac{92}{100} = 920$

$8\% \rightarrow 4000$

$8\% + 12\% \rightarrow 6000$

$10000 \times \frac{8}{100} = 800 + 120$

120

$1\% = 120$

$100\% = \frac{120}{2} \times 100\% = 6000$

If a sum of money amounts to ₹ 12, 900 and ₹ 14, 250 at the end of 4th year and 5th year respectively at a certain rate of simple interest, then the rate of interest is:

(a) 10% (b) 12%

(c) 18% (d) 20%

(SSC Constable (GD) Exam 12.05.2013)

SI : $\frac{Prr}{100}$

1080 15

5400 = $\frac{7500 \times r \times 4}{100}$

216 54 18

r = $\frac{1080}{15 \times 4}$

3

14250
12900
1350

12900
5400
7500

r : 18%

7500

P $\xrightarrow[4yr]{r\%}$ 12900 $\xrightarrow[1yr]{}$ 14250

5400

1yr = 1350

4yr = 5400

In simple interest rate per annum a certain sum amounts to ₹ 5,182 in 2 years and ₹ 5,832 in 3 years. The principal in rupees is

(a) ₹ 2882 (b) ₹ 5000

(c) ₹ 3882 (d) ₹ 4000

3882

P $\xrightarrow{2yr}$ 5182 $\xrightarrow{1yr}$ 5832

1300

1yr: 650 ×2

2yr: 1300

5182
1300
3882

5832
5182
650

(2)

6000 $\xrightarrow{1\%}$ 400

6% — II

6%+4% — III

40

$6000 \times \frac{6}{100} = 360 + 40$

III 4% = 40

100% = $\frac{40}{4\%} \times 100\% = 1000$

A sum of money lent out at simple interest amounts to ₹ 720 after 2 years and ₹ 1020 after a further period of 5 years. Find the principal.

(a) ₹ 6000 (b) ₹ 600

(c) ₹ 1740 (d) ₹ 120

600
P $\xrightarrow{2yr}$ 720 $\xrightarrow{5yr}$ 1020

120

5yr = 300

1yr = $\frac{300}{5}$ = 60

2yr = 120

A sum of ₹ 400 amounts to ₹ 480 in 4 years. What will it amount to if the rate of interest is increased by 2%?

(a) ₹ 484 (b) ₹ 560

(c) ₹ 512 (d) None of these

P A

400 $\xrightarrow[4\text{ yr}]{x\%}$ 480

32

512

400 $\xrightarrow[1\text{ yr}]{2\%}$ 8

1 × 4

$\xrightarrow[4\text{ yr}]{2\%}$ 32

A sum of ₹ 2,400 amounts to ₹ 3,264 in 4 years at a certain rate of simple interest. If the rate of interest is increased by 1% the same sum in the same time would amount to

(a) ₹ 3,288 (b) ₹ 3,312

(c) ₹ 3,340 (d) ₹ 3,360

(SSC MTS Exam 24.03.2013)

P A

2400 $\xrightarrow[4\text{ yr}]{r\%}$ 3264

96

3360

2400 $\xrightarrow[1\text{ yr}]{1\%}$ 24

$\xrightarrow[4\text{ yr}]{1\%}$ 24×4 = 96

A sum of ₹ 800 amounts to ₹ 920 in 3 years at the simple interest rate. If the the rate is increased by 3% p.a. , what will be the sum amount to in the same period?

(a) ₹ 992 (b) ₹ 962

(c) ₹ 942 (d) ₹ 982

P A

800 $\xrightarrow[3\text{ yr}]{r\%}$ 920

72

992

800 $\xrightarrow[3\text{ yr}]{3\%}$ $24 \times 3 = 72$

A certain sum amounts to ₹12096 at 8% p.a. in $5\frac{1}{2}$ years at simple interest. What will be the simple interest on the same sum at 10% p.a. in 8 years?

1. ₹6760
2. ₹6810
3. ₹6680
4. ₹6720 ✓

$5\frac{1}{2} \rightarrow 11/2$

$P \xrightarrow[4\frac{1}{2}\text{ yr}]{8\%} 12096$

$A = P + SI$

$A = P + \frac{PRT}{100}$

$12096 = P\left(1 + \frac{8 \times 11}{100 \times 2}\right)$

$\boxed{A = P\left(1 + \frac{RT}{100}\right)}$

$12096 = P\left(\frac{100 + 44}{100}\right) \Rightarrow P = \frac{12096 \times 100}{144} = 8400$

84
1008
12

$P \xrightarrow[8\text{ yr}]{10\%} SI$

$8400 \quad ?$

$SI = \frac{8400 \times 10 \times 8}{100}$

$SI = 6720$

A sum of ₹9000 amounts to ₹13356 at a certain rate percent per annum in $4\frac{2}{5}$ years at simple interest. What will be the simple interest on the same sum at double the rate for $2\frac{1}{3}$ years?

1. ₹4640
2. ₹4760
3. ₹4260
4. ₹4620 ✓

r $2r$ $7/3$ SI $\frac{22}{5}$

$9000 \xrightarrow[\frac{22}{5} \times 11]{r\%} 4356$

$\cancel{56}$ 11 726

$4356 = \frac{9000 \times r \times 22}{100 \times 8}$

$r = 11\%$ $2r = 22\%$

P

$9000 \xrightarrow[\frac{7}{3} \times 11]{22\%}$ SI $= \frac{9000 \times 22 \times 7}{100 \times 3} = 210 \times 22$

$= 4620$

$$\begin{array}{r} 13356 \\ 9000 \\ \hline 4356 \end{array}$$

$$\begin{array}{r} 21 \\ 22 \\ \hline 42 \\ 42 \\ \hline 4620 \end{array}$$

A certain sum invested on compound interest (compounded annually) grows to ₹5040 in three years. If the rate of interest is 20% for the first year, 40% for the second and 50% for the third year, then what is the sum?

1. ₹1210
2. ₹2566
3. ₹1800
4. ₹2000

A: 5040, t: 3yr

r%	I	II	III
	20%	40%	50%

$$\frac{100}{120} \times \frac{100}{140} \times \frac{100}{150} = \frac{25}{63}$$

25 → P, 63 → A, ×80 → 5040

80

25 = $\frac{5040}{63} \times 25 = 2000$

A sum of ₹1000 is invested on compound interest (compounding annually) for three years. If the rate of interest is 10% per annum for the first two years and 50% per annum for the third year, then what will be the interest?

1. ₹612
2. ₹655
3. ₹815
4. ₹756

P = 1000 CI = ?

r% I II III

10% 10% 50%

$\frac{100}{110} \times \frac{100}{110} \times \frac{150}{100} = \frac{200}{363}$ A

1000 / 200 P) 163 CI

121
3
363

163 = CI = $\frac{1000}{200} \times 163$

= 815

Raman paid ₹ 13,300 as interest after 9 years. He had borrowed some money at rate of 6% for first two years, 9% for next three years and 14% for rest of the period. How much money did he borrow?

1. ₹ 12,000
2. ₹ 10,000
3. ₹ 14,000
4. ₹ 12,500

SI = 13300 P = ? t = 9 yr

2 yr 6% 2×6% = 12%

3 yr 9% 3×9% = 27%

4 yr 14% 4×14% = 56%

10% 2 yr

10% + 10% = 20%

overall r = 95% ⇒ 13300

$100\% = \frac{13300}{95} \times 100$

= 700 × 20 =

= 14000

12
27
56
95%

A principal of Rs. 10,000, after 2 years compounded annually, the rate of interest being 10% per annum during the first year and 12 % per annum during the second year (in rupees) will amounts to:

(a) Rs. 12,000 (b) Rs. 12,320
(c) Rs. 12,500 (d) Rs. 21,000

P: 10000 t: 2yr

r: I II

10% 12%

$\frac{100}{110} \times \frac{100}{112} = \frac{10000 - P}{12320 - A}$

112
11
112
112
1232

What does Rs. 250 amounts to in 2 years with compound interest at the rate of 4% in the 1st year and 8% in the second year?

(a) Rs. 280 (b) Rs. 280.80

(c) Rs. 468 (d) Rs. 290.80

(SSC GD Exam 12.05.2013)

P = 250 A : ? t = 2 yr

r	I	II
	4%	8%

$\frac{\cancel{100}^{25}}{\cancel{100}_{26}} \times \frac{\cancel{104}^{25}}{\cancel{108}_{27}} = \frac{625}{702} - 250 \rightarrow ?$

$702 : A = \frac{\cancel{250}^{\cancel{10}\,2}}{\cancel{625}_{\cancel{25}\,\cancel{5}}} \times \cancel{702}^{140.4}$

$\begin{array}{r} 26 \\ 27 \\ \hline 182 \\ 52 \\ \hline 702 \end{array}$ 4 1

= 2 × 140.4

= 280.80

The amount on ₹ 25000 in 2 years at annually compound interest. if the rates for the successive years be 4% and 5% per annum respectively is:

(a) ₹ 26800 (b) ₹ 27300

(c) ₹ 28500 (d) ₹ 30000

A: ? P: 25000 t: 2 yr

r	I	II
	4%	5%

$\frac{25}{100} \times \frac{105}{100} = \frac{250}{273} \rightarrow 25000$

$\frac{21}{13}$

$\frac{63}{21}$

$\frac{273}{}$

A: 27300

A sum of ₹ 10500 becomes ₹ 17745 in 2 years at the rate of compound interest. If the interest is compounded annually, then what will be the rate of interest?

1. 40%
2. 30%
3. 25%
4. 20%

r = ?

P → A

10500 $\xrightarrow{2\,yr}$ 17745

10 $\xrightarrow{1\,yr}$ 13

CI = 3

$r\% = \frac{3}{10} \times 100 = 30\%$

P : A = 10500 : 17745

2100 : 3549

700 : 1183

100 : 169

$10^2 : 13^2$

At what percent per annum will Rs. 3000 amounts to Rs. 3993 in 3 years if the interest is compounded annually ? $r = ?$

(a) 9% (b) 10%

(c) 11% (d) 13%

$1^2 - 30^2$

$1^3 - 15^3$

$P \xrightarrow{3yr} A$

$3000 \xrightarrow{3yr} 3993$

$10^3 \xrightarrow{3yr} 11^3$

$3 \times \frac{1}{3} = 1$

$10^{3 \times \frac{1}{3}} \xrightarrow{1 \times r} 11^{3 \times \frac{1}{3}}$ $\times \frac{1}{3}$

$10 \xrightarrow{1yr} 11$

1

$r\% = \frac{1}{10} \times 100 = 10\%$

1000 1331

$P : A = 3000 : 3993$

$P : A = 1000 : 1331$

$P : A = 10^3 : 11^3$

At what rate per cent per annum will Rs. 2304 amounts to Rs. 2500 in 2 years at compound interest? r:?

(a) $4\frac{1}{2}\%$ (b) $4\frac{1}{5}\%$

(c) $4\frac{1}{6}\%$ (d) $4\frac{1}{3}\%$

P:A – 2304 : 2500

576 : 625

$24^2 : 25^2$

P A

2304 $\xrightarrow{2yr}$ 2500

$24^{2\times1/2}$ $)\times1/2$ $25^{2\times1/2}$

P A

24 $\xrightarrow{1yr}$ 25

$\frac{1}{24}\times100 = 4\frac{1}{6}$

$= 4\frac{1}{6}\%$

A sum of Rs. 8000 will amount to Rs. 8820 in 2 years if the interest is calculated every year. The rate of compound interest is:

$r = ?$

(a) 6% (b) 7%

(c) 3% (d) 5%

P: A: 8000 : 8820

400 : 441

$20^2 : 21^2$

P A

8000 $\xrightarrow{2\text{ yr}}$ 8820

$20^2 \xrightarrow{2\text{ yr}} 21^2$

$20 \xrightarrow{1\text{ yr}} 21$

1

$r = \frac{1}{20} \times 100 = 5\%$

2 yr = 820

1 1

400 400+20

400 → 20

100 → 5%

At what rate of compound interest per annum will a sum of ₹1200 become ₹1348.32 in 2 years?

r: ?

(a) 6.5% (b) 4.5%

(c) 6% (d) 7.5%

1200 $\xrightarrow{2\,yr}$ 1348.32

P A

120000 $\xrightarrow{2\,yr}$ 134832

50 $\xrightarrow{1\,yr}$ 53

3

P : A :- ~~120000 : 134832~~

~~60000 : 67416~~

~~10000 : 11236~~

~~5000 : 5618~~

2500 : 2809

50^2 : 53^2

$r = \frac{3}{50} \times 100 = 6\%$

At what rate percent of compound interest on ₹ 10,000 amounts to ₹ 13,310 in 3 years is:

(a) 13% (b) 11% (c) 10% (d) 12%

$1000\cancel{0} : 1331\cancel{0}$

$10^3 : 11^3$

$10000 \xrightarrow{3\,yr} 13310$

$10 \xrightarrow{1\,yr} 11$

$\frac{1}{10} \times 100 = 10\%$

P, A, r $\quad t = ?$

$r : 20\% = \frac{1}{5}$

$P \xrightarrow{r\%} A$

$\frac{5}{5} \cdot \xrightarrow{1 \times 1} \frac{6}{6}$

$5 = \quad \times \quad 6 =$

In what time will Rs. 1000 amounts to Rs. 1331 at 20% per annum, compounded half yearly?

(a) $1\frac{1}{2}$ years (b) 2 years

(c) 1 years (d) $2\frac{1}{2}$ years

6 months = 1 yr

$20\% = \frac{20}{2} = 10\% = \frac{1}{10}$

$10 \xrightarrow[\times 3]{1\,yr} 11$

$10^3 \xrightarrow{3\,yr} 11^3$

$1000 \xrightarrow[6\,yr]{10\%} 1331$

$10^3 \longrightarrow 11^3$

3 yr : 1.5 yr

P

80000 $\xrightarrow{5\%}$ 92610

t : ?

20 $\xrightarrow{1\times 1}$ 21

5% : 1/20

20^3 $\xrightarrow[3\times 1]{1\times 3}$ 21^3

20 $\xrightarrow{1\times 1}$ 21

$\boxed{t : 3\times 1}$

80000 : 92610

20^3 : 21^3

The compound interest on an amount for 2 years at 5% per annum compounded annually is ₹205. The simple interest is:

1. ₹210
2. ₹220
3. ₹200
4. ₹250

A

F: 2 yr r: 5% CI: 205 SI: ?

P: 100

SI

I II

5 + 5 = 10

?

$5 \times \frac{5}{100} = \frac{25}{100} = 0.25$

CI

I II

5 + 5 + 0.25

5 + 5.25 = 10.25

||

205

$10 = \frac{20500}{1025} \times 10 = 200$

The difference between the compound interest and simple interest on a certain sum at 10% per annum for 2 years is ₹ 42 when the interest is compounded yearly. What is the sum?

1. ₹ 8400
2. ₹ 2100
3. ₹ 4200
4. ₹ 5200

P = 100

P

r = 10% t = 2 yr

CI - SI = 42 P = ?

SI

I II

10 10

20

CI

I II

10 10+1

21

1 = 42

100 = 4200

If the difference between simple and compound interest on a sum of money for 2 years at 5% p.a is ₹125, the sum (in ₹) is:

1. 50000
2. 5000
3. 10000
4. 1000

CI − SI = 125 t = 2 yr r = 5%

$5 \times \frac{5}{100} = \frac{25}{100} = 0.25$

P = 100

SI

I	II
5	5

10

CI

I	II
5	5 + 0.25 = 5.25

10.25

CI − SI = 0.25 ⇒ 125

$P = 100 = \frac{125}{25} \times 100 \times 100$

P = 50,000

The simple interest on a sum of money for 2 years at certain rate of interest is ₹320. The compound interest, compounded annually on the same sum for the same duration and at the same rate of interest is ₹384. The sum (in ₹) is:

1. 400 ✓
2. 250
3. 200
4. 309

t : 2 yr SI : 320 CI : 384 P : ?

$\begin{array}{r} 320 \\ 64 \end{array}$

r : x%

SI $\xrightarrow{2yr}$ 320

$\xrightarrow{1yr}$ 160

SI I	II	P (40%)	I	CI	II
160	160	→	160		160 + 64

$160 \times x\% = 64$

$r = \frac{x}{100} = \frac{64}{160} \times 100 = 40\%$

$P \times \frac{40}{100} = 160$

$\boxed{P : 400}$

If the compound interest on a certain sum for 2 years at 4% p.a. is Rs. 102, the simple interest at the same rate of interest for two years would be :

(a) Rs. 200 (b) Rs. 50

(c) Rs. 150 (d) Rs. 100

CI : 102 t : 2 yr

r : 4% SI : ?

$4 \times \frac{4}{100} = \frac{16}{100}$

$= 0.16$

P : 100

SI

I II

4 4

8 : ?

CI

I II

4 4 + 0.16

8.16 = 102

$8 = \frac{102}{8.16} \times 100 \times 8$

SI : 100

On what sum does the difference between the compound interest and the simple interest for 3 years at 10% is Rs. 31?

(a) Rs. 1500 (b) Rs. 1200

(c) Rs. 1100 (d) Rs. 1000

P = ? t = 3 yr

r = 10% CI − SI = 31

×10

3.1 = 31

×10

100 = 1000

SI P = 100 CI

SI I	SI II	SI III	CI I	CI II	CI III
10	10	10	10	10+1 = 11	11+1.1 = 12.1

30 diff 3.1 33.1

$11 \times \frac{10}{100} = 1.1$

The difference between the simple and compound interest on a certain sum of money at 5% rate of interest per annum for 2 years is Rs. 15. Then the sum is:

(a) Rs. 6,500 (b) Rs. 5,500

(c) Rs. 6,000 (d) Rs. 7,000

r : 5% t : 2 yrs Diff. : 15

CI - SI : 15

SI P - 100 CI

10 5 5 + 0.25

10.25

CI - SI : 0.25 = 15

P : 100 $= \frac{1500}{25} \times 100$

= 6000

The difference between compound interest and simple interest on Rs. 2500 for 2 years at 4% per annum is:

(a) Rs. 40 (b) Rs. 45

(c) Rs. 14 (d) Rs. 4

CI - SI = ? P = 2500

r = 2 yr , r = 4%

P = 100

$4 \times \frac{4}{100} = 0.16$

SI

CI

8

4 4 + 0.16

CI - SI = 0.16 = ?

100 = 2500

$0.16 = \frac{2500}{100} \times 0.16$

= 4

The difference between simple and compound interest (compounded annually) on a sum of money for 2 years at 10% per annum is Rs. 65. The sum is

(a) Rs. 65650 (b) Rs. 65065

(c) Rs. 6565 (d) Rs. 6500

P

100

SI CI

20 10 10+1

2,

1 : 65

100 : 6500

population or price ↓ ↑

$P \rightarrow A \rightarrow A_2 \rightarrow A_3$

$P_1' \rightarrow P_2 \rightarrow P_2 \rightarrow P_3$

depreciate

The value of a flat worth ₹7,000,000 is depreciating at the rate of 20% p.a. Then in how many years will the value be reduced to ₹35,84,000.

P A

r = 20% = 1/5 a

1. 5 years
2. 4 years
3. 2 years
4. 3 years

$2x\ 5 \xrightarrow{1\times r} 4\times 2$

$10 \xrightarrow[\times 3]{1\times r} 8$

$10^3 \xrightarrow{3\times r} 8^3$

7000 000 : 35 84 000

1000 : 512

$10^3 : 8^3$

The value of a property depreciates every year by 10% of its value at the beginning of the year. The present value of the property is ₹ 8100. What was its value 2 years ago ?

(a) ₹10,000 (b) ₹ $\left(\frac{90}{11}\right)^2 \times 100$

(c) ₹ $\left(\frac{100}{101}\right)^2 \times 8100$ (d) ₹ 9801

$r = 10\% = \frac{1}{10}$

$10 \xrightarrow{1\,yr} 9$

$\times 2$

P $100 = 10^2 \xrightarrow{2\,yr} 9^2 = 81$ A

$\downarrow$ $\downarrow$

10000 8100

Maths

The value of an equipment depreciates by 20% each year. How much less will the value of the equipment be after 3 years?

(a) 48.8% (b) 51.2%

(c) 54% (d) 60%

$20\% = 1/5$

$5 \xrightarrow{1\,yr} 4$

$)\times 3$

$125 = 5^3 \xrightarrow{3\,yr} 4^3 = 64$

61

$= \frac{61}{125} \times 100 = \frac{244}{5}$

48.8%

. The value of a machine depreciates by 5% every year. If its present value is ₹ 2,00,000, its value after 2 years will be:

(a) ₹ 1,80,500 (b) ₹ 1,99,000

(c) ₹ 1,80,000 (d) ₹ 2,10,000

$5\% = \frac{5}{100} = \frac{1}{20}$

$20 \xrightarrow{1 \times 1} 19$

$\times 2$

S E

$400 = 20^2 \xrightarrow{2 \times 1} 19^2 = 361$

200000 ?

$361 = \frac{\cancel{200000}^{500}}{\cancel{400}} \times 361 = 180500$ 3

If the population of a town is 64000 and its annual increase is 10%, then its population at the end of 3 years will be :

(a) 80000 (b) 85184

(c) 85000 (d) 85100

$10\% = 1/10 \uparrow$

$10 \xrightarrow{1\,yr} 11$

$)\times 3$

$1000 = 10^3 \xrightarrow{3\,yr} 11^3 = 1331$

$\downarrow$ 64000 $\qquad\qquad \downarrow$?

$1331 = \frac{64000}{1000} \times 1331$