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Compound Interest Questions Quiz for CDS, CLAT and SSC Exams

Compound Interest Quiz 3

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

1. A sum of money doubles itself at compound interest in 5 years. In how many years will it become eight times?

A. 20 years   B. 25 years   C. 30 years   D. 15 years

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2. What annual payment will discharge a debt of Rs. 7620 due in 3 years at 50/3% per annum compound interest?

A. Rs. 3430   B. Rs. 4334   C. Rs. 6465   D. Rs. 4544

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3. In a factory the production of cement rose 4840 tonnes from 4000 tonnes in two years. Find the rate of growth per annum.

A. 10   B. 12   C. 8   D. 9

---

4. Amit borrowed Rs. 20,000 from his friend at 15% per annum simple interest he lent it to Tarun at the same but rate compounded annually. Find his gain after 2 years.

A. 324   B. 604   C. 450   D. 572

---

5. Akash borrowed Rs. 72,000 from a bank to purchase one bike. If the rate of interest be 10% per annum compounded annually, what payment he will have to make after 2 years 4 months?

A. 75,752   B. 86,350   C. 85,040   D. 90,024

---

6. Certain sum amounts to Rs. 1,952 in two years and to Rs. 2,147.20 in 3 years at compound interest, then rate percent is:

A. 11%   B. 13%   C. 10%   D. 12%

---

7. The difference between simple and compound interests compounded annually on a certain sum of money for 2 years at 4% per annum is Re. 1. The sum (in Rs.) is:

A. Rs. 625   B. Rs. 630   C. Rs. 640   D. Rs. 650

8. A man gave 50% of his savings of Rs 84,100 to his wife and divided the remaining sum between his two sons A and B of 15 and 13 years of age respectively. He divided it in such a way that each of his sons, when they attain the age of 18 years, would receive the same amount at 5% compound interest per annum. The share of B was

A. Rs 20,000   B. Rs 20,050   C. Rs 22,000   D. Rs 22,050

9. The difference between compound and simple rates of interest on Rs. 10000 for 3 years at 5% p.a. is :

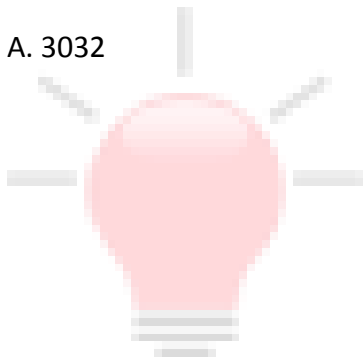A. 76   B. 76.25   C. 76.5   D. 76.75

10. Arvind takes a loan of Rs. 10500 at 10% p.a. compounded annually which is to be repaid in two equal annual installments. First at the end of one year and other at the end of the second year. The value of each installment.

A. 3032   B. 6050   C. 4500   D. 5630

Correct Answers:

1	2	3	4	5	6	7	8	9	10
D	A	A	C	D	C	A	A	B	B

Explanations:

1.

$$P\left(1 + \frac{R}{100}\right)^5 = 2P \Rightarrow \left(1 + \frac{R}{100}\right)^5 = \frac{2P}{P} = 2 \quad \text{...(i)}$$

Let $P\left(1 + \frac{R}{100}\right)^n = 8P$

$$\Rightarrow \left(1 + \frac{R}{100}\right)^n = 8 = 2^3 = \left\{\left(1 + \frac{R}{100}\right)^5\right\}^3 \quad \text{[using (i)]}$$

$$\Rightarrow \left(1 + \frac{R}{100}\right)^n = \left(1 + \frac{R}{100}\right)^{15} \Rightarrow n = 15.$$

Thus, the required time = 15 years.
Hence, option D is correct.

2.

So, $\dfrac{x}{\left(1 + \dfrac{50}{3 \times 100}\right)} + \dfrac{x}{\left(1 + \dfrac{50}{3 \times 100}\right)^2} + \dfrac{x}{\left(1 + \dfrac{50}{3 \times 100}\right)^3} = 7620$

$\Rightarrow 294x + 252x + 216x = 7620 \times 343$

$\Rightarrow x = \left(\dfrac{7620 \times 343}{762}\right) = 3430.$

So, Amount of each installment = Rs. 3430.
Hence, option A is correct.

3.

$$4840 = 4000 \left(1 + \frac{R}{100}\right)^2$$

$$\frac{121}{100} = \left(1 + \frac{R}{100}\right)^2$$

$$\left(\frac{11}{10}\right)^2 = \left(1 + \frac{R}{100}\right)^2$$

$$\Rightarrow \left(1 + \frac{10}{100}\right) = \left(1 + \frac{R}{100}\right) \Rightarrow R = 10.$$

Hence, option A is correct.

4. Method I:

As we all know,

S.I. and C.I. for 1st year is the same.

for second year C.I. = R% of S.I. + S.I.

By this,

Gain of Amit = C.I. of 2 years - S.I. of 2 years.

$\Rightarrow$ S.I. (of 1st year) + (S.I. + R% of S.I.) - 2 S.I.

$\Rightarrow$ R% of S.I.

As S.I. for each year is the same

So, gain = $\dfrac{15}{100} \times \dfrac{20{,}000 \times 15 \times 1}{100}$ $\Rightarrow$ 15 × 15 × 2 $\Rightarrow$ Rs. 450.

_____

Method II:

SI for 2 year at the rate of 15% = 15 × 2 = 30%

CI for 2 year at the rate of 15%, applying the net% effect for 2 years

= $15 + 15 + \dfrac{15 \times 15}{100}$ = 32.25%

Amit's gain % = 32.25% – 30% = 2.25%

So, Total gain of Amit = 2.25% of 20,000 = $\dfrac{2.25 \times 20{,}000}{100}$ = 450

Hence, option C is correct.

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5. Method I:

Principal amount → Rs. 72,000

Rate → 10%

Time = $\left(2 + \dfrac{1}{3}\right)$ years.

$A = P\left(1 + \dfrac{R}{100}\right)^{7/3}$

$A = 72000 \left(1 + \dfrac{10}{100}\right)^{7/3}$

$A = 72000 \left(\dfrac{11}{10}\right)^{2} \times \left(1 + \dfrac{10}{3 \times 100}\right)$

$A = 72000 \left(\dfrac{121}{100} \times \dfrac{31}{30}\right)$

A = 90,024.

_____

Method II:

CI for 2 yr 4 months at the rate of 10, applying the net% effect for first 2 years

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

Rate of interest of 4 months $= \frac{4}{12} \times 10 \approx 3.3\%$

For next 4 months $= 21 + 3.3 + \frac{21 \times 3.3}{100} = 24.99\% \approx 25\%$

Here, we can see that in 2yr 4 months the given compound rate of interest is approximate 25%.

Now, 125% of 72000 $= \frac{125 \times 72000}{100} = 90,000 \approx 90,024$

Hence, option D is correct.

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6. Let rate be R%

$$P \left(1 + \frac{R}{100}\right)^2 = 1952 \quad ....(i)$$

$$P \left(1 + \frac{R}{100}\right)^3 = 2147.20 \quad ....(ii)$$

Dividing equation (ii) by (i)

$$\Rightarrow \quad 1 + \frac{R}{100} = \frac{2147.2}{1952}$$

$$\Rightarrow \frac{R}{100} = \frac{2147.2 - 1952}{1952}$$

$$\Rightarrow R = \frac{195.2}{1952} \times 100 = 10\%.$$

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Method II:

Difference between the amount of 2 yr and 3 yr = 2147.20 − 1952 = 195.20

Now, this sum of Rs. 195.20 is earned as an interest on Rs. 1952 (2 years' SI) taken as principal.

Therefore, the reqd. rate % $= \frac{195.20}{1952} \times 100 = 10\%.$

Hence, option C is correct.

7. We can solve it by the net% effect formula,

Rate % of SI for 2 yr at 4% pa = 4 × 2 = 8%

Rate % of CI for 2 yr at 4% pa,

$$= 8 + 8 + \frac{8 \times 8}{100} = 8.16\%$$

% rate difference of CI and SI = 8.16% − 8 = 0.16%

Let the sum be x, then

0.16% of x = 1

$$x = \frac{1 \times 100}{0.16} = \text{Rs. } 625$$

Hence, option A is correct.

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8. Total Income = 84,100

After giving 50% salary to his wife the man is left with an amount = 42,050

Let's assume the man gave Rs. x to A. Therefore B will get Rs. (42050 − x).

$$42050$$

15 years A ↙   ↘ 13 years B

      x   (42050 − x)

Now, as per the question A & B will be getting an equal amount with CI at 5% rate per year at the 18th year.

$$\Rightarrow x \left(1 + \frac{5}{100}\right)^3 = (42050 - x) \left[1 + \frac{5}{100}\right]^5$$

$$\Rightarrow \frac{x}{(42050 - x)} = \frac{\left(1 + \frac{5}{100}\right)^5}{\left(1 + \frac{5}{100}\right)^3}$$

$$\Rightarrow \frac{x}{(42050 - x)} = \left(\frac{21}{20} \times \frac{21}{20}\right)$$

$$\Rightarrow 400 x = 42050 \times 441 - 441x$$
$$\Rightarrow 841x = 42050 \times 441$$

$$x = \frac{42050 \times 441}{841} = 50 \times 441 = 22050/\text{-}$$

Therefore, at the time of division of money, B would have got a sum = (42050 − 22050) = Rs. 20000

Hence, option A is correct.

9. SI for 3 year at the rate of 5% = 5 × 3 = 15%

CI for 3 year at the rate of 5%, applying the net% effect for first 2 years

$$= 5 + 5 + \frac{5 \times 5}{100} = 10.25\%$$

For next year $= 10.25 + 5 + \frac{10.25 \times 5}{100} = 15.7625\%$

Here, we can see that in 3 yrs the given compound rate of interest is 15.7625%.

Difference between SI and CI for 3 years = 15.7625 − 15% = 0.7625%

Now, 0.7625% of 10000 $= \frac{0.7625 \times 10000}{100} = 76.25$

Hence, option B is correct.

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10. Let the installments be x. Then,

According to the question,

$$\Rightarrow 10{,}500 = \frac{x}{\left(1 + \frac{10}{100}\right)} + \frac{x}{\left(1 + \frac{10}{100}\right)^2}$$
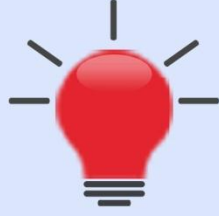
From formula, $A = P\left(1 + \frac{R}{100}\right)^n \Rightarrow P = \frac{A}{\left(1 + \frac{R}{100}\right)^n}$

$$\Rightarrow 10{,}500 = \left[\frac{10}{11} + \frac{100}{121}\right]x.$$

$$\Rightarrow 10{,}500 = \frac{110x + 100x}{121}$$

$$\Rightarrow x = \frac{10500 \times 121}{210} = 6050$$

Hence, option B is correct.