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Compound Interest Questions Quiz for Bank and Insurance Exams

Compound Interest Quiz 1

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

1. Akanskha invests Rs. x in insurance which gives her returns at 21% annually and Rs. y in mutual funds which gives her returns of 10% compounded half yearly. If Akanskha gets the same returns from both the investments after 1 year, then what is the square root of the ratio of x to y?

A. 1 : 2   B. 11 : 21   C. 21 : 22
D. 21 : 25   E. None of these

2. Irfan borrows a sum of Rs. 64000 at 5% pa compound interest. He repays a certain amount at the end of one year and the balance amount of Rs. 35700 at the end of the second year. What amount does he repay in the first year?

A. Rs. 34000   B. Rs. 37200   C. Rs. 36400
D. Rs. 35700   E. Rs. 33200

3. If the compound interest accrued on an amount of Rs. 15,000 in two years is Rs. 2,496, what is the rate of interest p.c.p.a.?

A. 8%   B. 10%   C. 6%
D. Can't be determined   E. None of these

4. What is be the compound interest (in Rs.) accrued on an amount of Rs. 15000 at the rate of 20 per cent annum in two years, if the interest is compounded half-yearly?

A. 6196.5   B. 6916.5   C. 4641.5
D. 6961.5   E. None of these

5. The compound interest on Rs. 10,000 in 2 years at 4% per annum, the interest being compounded yearly, is

A. Rs. 636.80   B. Rs. 816   C. Rs. 912
D. Rs. 828.82   E. None of these

6. Find the least number of complete year in which a sum of money put out at 30% CI, will be more than double.

A. 3 yr
B. 4 yr
C. 5 yr
D. 8 yr
E. None of these

---

7. A borrowed sum was paid in the two annual installments of Rs. 121 each. If the rate of CI is 10% pa, what sum was borrowed?

A. Rs. 217.80
B. Rs. 210
C. Rs. 220
D. Rs. 200
E. None of these

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8. A sum of money lent at CI for 2 yr at 20% pa would fetch Rs. 964 more, if the interest was payable half yearly than if it was payable annually. What is the sum?

A. Rs. 40000
B. Rs. 60000
C. Rs. 90000
D. Rs. 500000
E. None of these

---

9. A sum of money is borrowed and paid back in two annual installments of Rs. 1764 each, allowing 5% CI. What was the sum borrowed?

A. Rs. 4000
B. Rs. 3340
C. Rs. 3000
D. Rs. 3280
E. None of these

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10. The income of a company increases 20% pa. If its income is Rs. 2664000 in the year 1998, what was its income in 1996?

A. Rs. 1800000
B. Rs. 4536527
C. Rs. 1850000
D. Rs. 3830000
E. None of these

Correct Answers:

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

Explanations:

1. Amount earned from insurance after one year;

A_1 = (100 + Interest) × Principal = 121% of x

Applying net% effect in the 2nd scenario to get th effective rate of interest compound half-yearly, we get

Net% effect = $x + y + \dfrac{xy}{100}$%

Here, a = b = 5%

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

∴ Amount earned from mutual funds

A_2 = (100 + interest) × Principal = (100 + 10.25)% = 110.25% of y

Given, $A_1 = A_2$

121% of x = 110.25% of y

∴ $\dfrac{x}{y} = \dfrac{110.25}{121} = \dfrac{441}{484}$

∴ $\sqrt{\dfrac{x}{y}} = \sqrt{\dfrac{441}{484}}$ = 21 : 22

Hence, option C is correct.

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2. Sum = Rs. 64000

∴ CI for 1st year = $\dfrac{64000 \times 5}{100}$ = Rs 3200

∴ A = 64000 + 320 = Rs. 67200

let the amount repaid be Rs.

Then, the sum at the beginning of the 2nd year = 67200 − x

Amount at the 2nd year = $\dfrac{100 + \text{Interest}}{100}$ × principal × time

$\Rightarrow 35700 = 1.05 \times (67200 - x) \times 1$

$\Rightarrow x = \text{Rs. } 33200.$

Hence, option E is correct.

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3. Principal (P) = Rs. 15000; CI = Rs. 2496; Time (t) = 2 years.

Let the rate be R% per annum. then,

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

Or

$$\Rightarrow 2496 = 15000\left[\left(1 + \frac{R}{100}\right)^2 - 1\right]$$

$$\Rightarrow \frac{2496}{15000} + 1 = \left(1 + \frac{R}{100}\right)^2 \Rightarrow \frac{17496}{15000} = \left(1 + \frac{R}{100}\right)^2$$

$$\Rightarrow \frac{729}{625} = \left(1 + \frac{R}{100}\right)^2$$

By comparing,

$$\Rightarrow \left(\frac{27}{25}\right)^2 = \left(1 + \frac{R}{100}\right)^2 \Rightarrow \frac{27}{25} = 1 + \frac{R}{100}$$

$$\Rightarrow R = \left(\frac{27}{25} - 1\right) \times 100 \Rightarrow R = 8\%$$

Hence, option A is correct.

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4. Rate of interest (half yearly) = $\frac{20}{2}$ = 10%

Now, P = 15000, T = 2 = 4 half years

By the net% effect we would calculate the effective compound rate of interest for 4 half years = 46.41% (Refer to sub-details)

Therefore, CI = 46.41% of 15000

$$CI = \frac{46.41 \times 15000}{100} = \text{Rs. } 6961.5$$

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Sub-details:

Calculation of effective compound rate of interest for 4 half years will be as follows.

For the first 2 half years, let's apply the net% effect.

Here, x = y = 10%

Net% effect = x + y = $\dfrac{xy}{100}$

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

Now let's take this 21% as x and 10% as y for the calculation of 3rd half year.

= 21 + 10 + $\dfrac{21 \times 10}{100}$ = 33.1%

Similarly, let's take this 33.1% as x and 10% as y for the calculation of 4th half year.

= 33.1 + 10 + $\dfrac{33.1 \times 10}{100}$ = 43.1 + 3.31 = 46.41%

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Traditional Method:

If interest is compounded half-yearly then time (t) = 2 × 2 = 4; r% = $\dfrac{20}{2}$ = 10%

$A = \left[P\left(1 + \dfrac{R}{100}\right)^t\right]$
Or
= $15000\left[\left(1 + \dfrac{10}{100}\right)^4\right]$

= $15000 \times \dfrac{11}{10} \times \dfrac{11}{10} \times \dfrac{11}{10} \times \dfrac{11}{10}$ = Rs. 21961.5

∴   CI = 21961.5 − 15000 = Rs. 6961.5

Hence, option D is correct.

5. Rate of interest = 4%
Therefore, applying the net% effect formula for effective rate of compound interest for 2 years , we get

Net% effect = x + y + $\dfrac{xy}{100}$%

x = y = 4%

= 4 + 4 + $\dfrac{4 \times 4}{100}$ = 8 + .16 = 8.16%

CI = 8.16% of 10,000

$$= \frac{8.16 \times 10000}{100} = \text{Rs. 816}$$

Hence, option B is correct,

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6. 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 1st 2 yrs = $30 + 30 + \dfrac{30 \times 30}{100} = 69\%$

Again, for next 1 yr = $69 + 30 + \dfrac{69 \times 30}{100} = 119.7\%$

Here, we can see that in 3 yrs the given compound rate of interest is occurring to more than 100%.

Therefore, 3 yrs is the correct answer.

Hence, option A is correct.

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7. According to the question,

$\Rightarrow$ Borrowed sum = $\dfrac{121}{\left(1 + \dfrac{10}{100}\right)} + \dfrac{121}{\left(1 + \dfrac{10}{100}\right)^2}$

From formula, $A = P\left(1 + \dfrac{R}{100}\right)^n \Rightarrow P = \dfrac{A}{\left(1 + \dfrac{R}{100}\right)^n}$

$\Rightarrow \dfrac{121}{\left(\dfrac{11}{10}\right)} + \dfrac{121}{\left(\dfrac{11}{10}\right)^2}$

$\Rightarrow \dfrac{121 \times 10}{11} + \dfrac{121 \times 100}{121}$

$\Rightarrow 110 + 100 = \text{Rs. 210.}$

Hence, option B is correct.

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8. Case I: When CI compounded half-yearly

rate of interest = 10%

Frequency of interest occurring in 2 yrs = 4

Applying the net% effect formula of 1st yr, (1st two frequencies)

Net% effect = $10 + 10 + \dfrac{10 \times 10}{100} = 21\%$

Fore next half a year,

$= 21 + 10 + \dfrac{21 \times 10}{100} = 33.1\%$

For next half a year,

$= 33.1 + 10 + \dfrac{33.1 \times 10}{100} = 46.41\%$

Case II: When CI compounded year y
Rate of interest = 20%
Frequency of interest occurring in 2 yrs = 2
Applying the net% effect formula of 2 yrs, we get

$= 20 + 20 + \dfrac{20 \times 20}{100} = 44\%$

Now, difference in % rate = 46.41% − 44%

$2.41\% \equiv 964$

$100\% \equiv x$

$\therefore \quad x = \dfrac{964 \times 100}{2.41} = 40{,}000/\text{-}$

Hence, option A is correct.

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9. According to the question,

$\Rightarrow$ Borrowed sum $= \dfrac{1764}{\left(1 + \dfrac{5}{100}\right)} + \dfrac{1764}{\left(1 + \dfrac{5}{100}\right)^2}$

From formula, $A = P\left(1 + \dfrac{R}{100}\right)^n \Rightarrow P = \dfrac{A}{\left(1 + \dfrac{R}{100}\right)^n}$

$\Rightarrow \dfrac{1764}{\left(\dfrac{21}{20}\right)} + \dfrac{1764}{\left(\dfrac{21}{20}\right)^2}$

$\Rightarrow \dfrac{1764 \times 20}{21} + \dfrac{1764 \times 400}{441}$

$\Rightarrow 84 \times 20 + 4 \times 400 = 1680 + 1600 =$ Rs. 3280.

Hence, option D is correct.

10. Method I:

Reqd income = $\dfrac{2664000}{\left(1 + \dfrac{20}{100}\right)^2}$

$= \dfrac{2664000}{\left(\dfrac{6}{5}\right)^2}$

$= \dfrac{2664000 \times 25}{36}$ = Rs. 1850000

Method II:

We can solve this question by the net% effect formula,

CI for 2 years at the rate of 20% pa,

$= 20 + 20 + \dfrac{20 \times 20}{100}$ = 44%

Let the sum be x,

Amount given = 2664000

So, (100 + 44)% of x = 2664000

$x = \dfrac{2664000 \times 100}{144}$ = 1850000

Hence, option C is correct.

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