COMPOUND INTEREST

Money is said to be lent at compound interest (C. I.) if the interest is not paid as soon as falls due, but is added to the Principal after a fixed period, so that the amount at the end of period becomes the principal for the next period. If A is the amount, C.I. is the compound interest, P is the principal, R is the rate, and t is the time, then

$$A = P\,(1 + R/100\,)^t$$

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

Note :

1- If interest is paid half yearly; time is doubled, and the rate is halved.

2- Compound interest for one year is equal to the simple interest for one year.

Some Unsolved Examples -

Example 1- The simple interest on certain sum of money for 3 years at 4 % is Rs. 303.60. Find the compound interest on the same sum for the same period at the same rate ?

Example 2- A sum of money put out at compound interest amounts in one year to Rs. 4050 and in three years to Rs. 4723.92. Find the original sum and the rate of interest.

Example 3- A sum of Rs. 13040 is borrowed at $3\frac{3}{4}\%$ per annum. Compound interest is to be repaid in two equal yearly instalments. Find the amount of each instalment.

EXERCISE

1. Kamal borrows Rs. 500 from a bank. If the bank charges interest at 6 % per annum, how much amount shall he pay after 2 years ?

   (a) Rs. 560.00 (b) Rs. 561.80

   (c) Rs. 572.70 (d) Rs. 512.40

   (e) None of these

2. A sum of money placed at compound interest doubles itself in 4 years. In how many years will it amount to 8 times ?

   (a) 6 years (b) 8 years

   (c) 12 years (d) 10 years

   (e) None of these

3. Find the compound interest of Rs. 10,000 in 9 months at 4 % per annum interest payable quarterly.

   (a) Rs. 300 (b) Rs. 310

   (c) Rs. 303 (d) Rs. 303.01

   (e) None of these

4. Some money was lent on 4 % C. I. If the difference in interest of second and the first year is Rs. 88, find out the sum.

   (a) Rs. 50, 000 (b) Rs. 60,000

   (c) Rs. 65,000 (d) Rs. 55,000

   (e) None of these

5. The population of a town is 50,000. It decreases by 20 per thousand per year. Find out the population after 2 years.

   (a) 46,000 (b) 46,200

   (c) 48,020 (d) 48,320

   (e) None of these

6. If the population of a town at present is 10648 and the rate of increment is 10 % per year. What was the population before 3 years ?

(a) 10,000 (b) 9,000

(c) 11,000 (d) 8,000

(e) None of these

7. A father left a will of Rs. 16,400 for his two sons aged 17 and 18 years. They must get equal amounts when they are 20 years at 5 % compound interest. Find the present share of the younger son.

(a) Rs. 8,000 (b) Rs. 8,400

(c) Rs. 8,200 (d) Rs. 10,000

(e) None of these

8. The compound interest on a sum of money for 2 years is Rs. 410 and the simple interest on the same sum for the same period and at the same rate is Rs. 400. Find the rate of interest.

(a) 4 % (b) 3 %

(c) 5 % (d) 6 %

(e) None of these

Answer Key

1. b
2. c
3. d
4. d
5. c
6. d
7. a
8. c

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