

Answer the questions

- (1) Number of employees in a company increases by 30% every year. If there are 6000 employees in the company, find the number of employees in company after 2 years.
- (2) Find compound interest on Rs. 1000 for 6 months at 12% per annum compounded half yearly.
- (3) Find compound interest on Rs. 5000 for 2 years at 10% per annum compounded annually.
- (4) Pradip bought a plot at Rs. 700000. If its value appreciates at the rate of 10% per annum, find the value of the plot after 2 years.
- (5) Ria borrowed Rs. 7000 from a bank at the interest rate of 10% per annum compounded annually. What would be the amount payable to bank after 3 years?
- (6) At the rate of 10% per annum compounded annually, how long would it take for a sum of Rs. 20000 to compound to Rs. 26620.
- (7) Find compound interest on Rs. 30000 for 2 years and 6 months at 20% per annum compounded annually.
- (8) Population of a town increases by 2% every year. If current population of the town is 90000. Find the population of town after 2 years.



Answers

(1) 10140

Step 1

It is given that number of employees increases at a compounding rate of 30% yearly.

Step 2

Number of employees in the company (P) = 6000

Yearly compounding rate (R) = 30%

Time (n) = 2 years

Step 3

Using compound interest formula,

$$\text{Number of employees after 2 years} = P\left(1 + \frac{R}{100}\right)^n$$

$$= 6000\left(1 + \frac{30}{100}\right)^2$$

$$= 6000 \times (1.3)^2$$

$$= 6000 \times 1.69$$

$$= 10140$$

Step 4

Therefore, the number of employees in the company after 2 years is **10140**.

(2) Rs. 60

Step 1

We have been asked to find the compound interest on Rs. 1000 for 6 months at 12% per annum compounded half yearly.

Step 2

Principal, P = Rs. 1000

Number of terms, n = Number of half years in 6 months = 1

Interest Rate per annum = 12%, Interest Rate per term of half year, R = $12\% \div 2 = 6\%$

Step 3

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

$$= 1000\left(1 + \frac{6}{100}\right)^1$$

$$= 1000 \times 1.06$$

$$= \text{Rs. } 1060$$

Step 4

Compound Interest = Amount - Principal

$$= 1060 - 1000$$

$$= \text{Rs. } 60$$

Step 5

Therefore, the compound interest is **Rs. 60**.

(3) Rs. 1050

Step 1

We have been asked to find the compound interest on Rs. 5000 for 2 years at 10% per annum compounded annually.

Step 2

Principal, P = Rs. 5000

Rate, R = 10%

Time, n = 2 years

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

$$= 5000\left(1 + \frac{10}{100}\right)^2$$

$$= 5000(1.1)^2$$

$$= 5000 \times 1.21$$

$$= \text{Rs. } 6050$$

Step 3

Compound interest = Amount - Principal

$$= 6050 - 5000$$

$$= 1050$$

Step 4

Therefore, the compound interest is **Rs. 1050**.

(4) Rs. 847000

Step 1

We have been asked to find the value of the plot after 2 years.

Step 2

Principal, P = Rs. 700000

Rate, R = 10%

Time, n = 2 years

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

$$= 700000\left(1 + \frac{10}{100}\right)^2$$

$$= 700000 \times 1.21$$

$$= 847000$$

Step 3

Therefore, the value of plot after the 2 years is **Rs. 847000**.

(5) Rs. 9317

Step 1

It is given that,

Principal, $P = \text{Rs. } 7000$ Rate, $R = 10\%$ Time, $n = 3 \text{ years}$

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

$$= 7000\left(1 + \frac{10}{100}\right)^3$$

$$= 7000 \times 1.331$$

$$= 9317$$

Step 2Therefore, the amount payable to the bank after 3 years is **Rs. 9317**.

(6) Three years

Step 1Let the time be n years.**Step 2**

According to the question,

Principal, $P = \text{Rs. } 20000$ Rate, $R = 10\%$

Amount = Rs. 26620

Step 3

Let's find the time.

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

$$\Rightarrow 26620 = 20000\left(1 + \frac{10}{100}\right)^n$$

$$\Rightarrow \frac{26620}{20000} = \left(\frac{110}{100}\right)^n$$

$$\Rightarrow \left(\frac{11}{10}\right)^3 = \left(\frac{11}{10}\right)^n$$

$$\Rightarrow n = 3$$

Step 4Therefore, in **3 years**, Rs. 20000 will become Rs. 26620 at 10% per annum compounded annually.

(7) Rs. 17520

Step 1

Principal, P = Rs. 30000

Rate, R = 20%

Time, n = 2 years and 6 months = $2\frac{6}{12}$ years**Step 2**

For first 2 years, interest can be calculated using compound interest formula,

$$\text{Amount} = P \left[1 + \frac{R}{100} \right]^n$$

$$\text{Amount} = 30000 \left[1 + \frac{20}{100} \right]^2$$

$$= 30000 \times 1.44$$

$$= \text{Rs. } 43200$$

Step 3

Since interest is compounded annually only, interest for remaining 6 month should be calculated as simple interest on a principal of Rs. 43200,

$$\text{Amount after simple Interest for 6 months} = 43200 \left[1 + \frac{(6/12)20}{100} \right]$$

$$\Rightarrow = 43200 \times 1.1$$

$$\Rightarrow = \text{Rs. } 47520$$

Step 4

Total interest = Amount - Principal

$$47520 - 30000$$

$$= \text{Rs. } 17520$$

Step 5Therefore, the total compound interest is **Rs. 17520**.

(8) 93636

Step 1

Since population increases by 2% annually, we can use compound interest formula where current population can be considered as principal.

Step 2

Current population or principal, $P = 90000$

Rate, R by which population increases every year = 2%

Time, $n = 2$ years

Step 3

Population of the town after 2 years or Amount = $P \left[1 + \frac{R}{100} \right]^n$

$$= 90000 \left[1 + \frac{2}{100} \right]^2$$

$$= 90000 \times 1.0404$$

$$= 93636$$

Step 4

Therefore, the population of the town after 2 years will be **93636**.