EXERCISE 14.1

Find the compound interest when principal = Rs 3000, rate = 5% per annum and time = 2 years.

Solution:

Given details are,

Principal (p) = Rs 3000

Rate (r) = 5%

Time = 2years

Interest for the first year = (3000×5×1)/100 = 150

Amount at the end of first year = Rs 3000 + 300 = Rs 3150

Principal interest for the second year = (3150×5×1)/100 = 157.5

Amount at the end of second year = Rs 3150 + 157.5 = Rs 3307.5

∴ Compound Interest = Rs 3307.5 – Rs 3000 = Rs 307.5

1. What will be the compound interest on Rs. 4000 in two years when rate of interest is 5% per annum?

Solution:

Given details are,

Principal (p) = Rs 4000

Rate (r) = 5%

Time = 2years

By using the formula,

$A = P (1 + R/100)^n$

$= 4000 (1 + 5/100)^2$

$= 4000 (105/100)^2$

= Rs 4410

∴ Compound Interest = A – P = Rs 4410 – Rs 4000 = Rs 410

2. Rohit deposited Rs. 8000 with a finance company for 3 years at an interest of 15% per annum. What is the compound interest that Rohit gets after 3 years?

Solution:

Given details are,

Principal (p) = Rs 8000

Rate (r) = 15%

Time = 3years

By using the formula,

$A = P (1 + R/100)^n$

$= 8000 (1 + 15/100)^3$

$= 8000 (115/100)^3$
$= Rs\ 12167$
∴ Compound Interest = A – P = Rs 12167 – Rs 8000 = Rs 4167

3. Find the compound interest on Rs. 1000 at the rate of 8% per annum for 1 ½ years when interest is compounded half yearly.
Solution:
Given details are,
Principal (p) = Rs 1000
Rate (r) = 8%
Time = 1 ½ years = 3/2 × 2 = 3 half years
By using the formula,
$A = P (1 + R/200)^{2n}$
$= 1000 (1 + 8/200)^3$
$= 1000 (208/200)^3$
$= Rs\ 1124.86$
∴ Compound Interest = A – P = Rs 1124.86 – Rs 1000 = Rs 124.86

4. Find the compound interest on Rs. 160000 for one year at the rate of 20% per annum, if the interest is compounded quarterly.
Solution:
Given details are,
Principal (p) = Rs 160000
Rate (r) = 20% = 20/4 = 5% (for quarter year)
Time = 1year = 1 × 4 = 4 quarters
By using the formula,
$A = P (1 + R/100)^n$
$= 160000 (1 + 5/100)^4$
$= 160000 (105/100)^4$
$= Rs\ 194481$
∴ Compound Interest = A – P = Rs 194481 – Rs 160000 = Rs 34481

5. Swati took a loan of Rs. 16000 against her insurance policy at the rate of 12 ½ % per annum. Calculate the total compound interest payable by Swati after 3 years.
Solution:
Given details are,
Principal (p) = Rs 16000
Rate (r) = 12 ½ % = 12.5%
Time = 3years

By using the formula,
$A = P (1 + R/100)^n$
$= 16000 (1 + 12.5/100)^3$
$= 16000 (112.5/100)^3$
$= Rs\ 22781.25$
∴ Compound Interest = A – P = Rs 22781.25 – Rs 16000 = Rs 6781.25

6. Roma borrowed Rs. 64000 from a bank for 1 ½ years at the rate of 10% per annum. Compare the total compound interest payable by Roma after 1 ½ years, if the interest is compounded half-yearly.
Solution:
Given details are,
Principal (p) = Rs 64000
Rate (r) = 10 % = 10/2 % (for half a year)
Time = 1 ½ years = 3/2 × 2 = 3 (half year)
By using the formula,
$A = P (1 + R/100)^n$
$= 64000 (1 + 10/2\times100)^3$
$= 64000 (210/200)^3$
$= Rs\ 74088$
∴ Compound Interest = A – P = Rs 74088 – Rs 64000 = Rs 10088

7. Mewa lal borrowed Rs. 20000 from his friend Rooplal at 18% per annum simple interest. He lent it to Rampal at the same rate but compounded annually. Find his gain after 2 years.
Solution:
Given details are,
Principal (p) = Rs 20000
Rate (r) = 18 %
Time = 2 years
By using the formula,
Interest amount Mewa lal has to pay,
By using the formula,
Simple interest = P×T×R/100
= (20000×18×2)/100 = 7200

Interest amount Rampal has to pay to Mewa lal,
By using the formula,
$A = P (1 + R/100)^n$

$= 20000 (1 + 18/100)^2$
$= 20000 (118/100)^2$
= Rs 27848 – 20000 (principal amount)
= Rs 7848

∴ Mewa lal gain = Rs (7848 - 7200) = Rs 648

8. Find the compound interest on Rs. 8000 for 9 months at 20% per annum compounded quarterly.
Solution:
Given details are,
Principal (p) = Rs 8000
Rate (r) = 20 % = 20/4 = 5% (for quarterly)
Time = 9 months = 9/3 = 3 (for quarter year)
By using the formula,
$A = P (1 + R/100)^n$
$= 8000 (1 + 5/100)^3$
$= 8000 (105/100)^3$
= Rs 9261
∴ Compound Interest = A – P = Rs 9261 – Rs 8000 = Rs 1261

9. Find the compound interest at the rate of 10% per annum for two years on that principal which in two years at the rate of 10% per annum given Rs. 200 as simple interest.
Solution:
Given details are,
Simple interest (SI) = Rs 200
Rate (r) = 10 %
Time = 2 years
So, by using the formula,
Simple interest = P×T×R/100
P = (SI × 100)/ T×R
= (200 × 100) / 2 × 10
= 20000/20
= Rs 1000

Now,
Rate of compound interest = 10%
Time = 2years

By using the formula,
$A = P (1 + R/100)^n$
$= 1000 (1 + 10/100)^2$
$= 1000 (110/100)^2$
$= Rs\ 1210$
∴ Compound Interest = A – P = Rs 1210 – Rs 1000 = Rs 210

10. Find the compound interest on Rs. 64000 for 1 year at the rate of 10% per annum compounded quarterly.
Solution:
Given details are,
Principal (p) = Rs 64000
Rate (r) = 10 % = 10/4 % (for quarterly)
Time = 1year = 1× 4 = 4 (for quarter in a year)
By using the formula,
$A = P (1 + R/100)^n$
$= 64000 (1 + 10/4\times100)^4$
$= 64000 (410/400)^4$
$= Rs\ 70644.03$
∴ Compound Interest = A – P = Rs 70644.03 – Rs 64000 = Rs 6644.03

11. Ramesh deposited Rs. 7500 in a bank which pays him 12% interest per annum compounded quarterly. What is the amount which he receives after 9 months.
Solution:
Given details are,
Principal (p) = Rs 7500
Rate (r) = 12 % = 12/4 = 3 % (for quarterly)
Time = 9 months = 9/12years = 9/12 × 4 = 3 (for quarter in a year)
By using the formula,
$A = P (1 + R/100)^n$
$= 7500 (1 + 3/100)^3$
$= 7500 (103/100)^3$
$= Rs\ 8195.45$
∴ Required amount is Rs 8195.45

12. Anil borrowed a sum of Rs. 9600 to install a hand pump in his dairy. If the rate of interest is 5 ½ % per annum compounded annually, determine the compound interest which Anil will have to pay after 3 years.
Solution:

Given details are,
Principal (p) = Rs 9600
Rate (r) = 5 ½ % = 11/2 %
Time = 3years
By using the formula,
$A = P (1 + R/100)^n$
$= 9600 (1 + 11/2\times100)^3$
$= 9600 (211/200)^3$
= Rs 11272.71
∴ Compound Interest = A – P = Rs 11272.71 – Rs 9600 = Rs 1672.71

13. Surabhi borrowed a sum of Rs. 12000 from a finance company to purchase a refrigerator. If the rate of interest is 5% per annum compounded annually, calculate the compound interest that Surabhi has to pay to the company after 3 years.
Solution:
Given details are,
Principal (p) = Rs 12000
Rate (r) = 5 %
Time = 3years
By using the formula,
$A = P (1 + R/100)^n$
$= 12000 (1 + 5/100)^3$
$= 12000 (105/100)^3$
= Rs 13891.5
∴ Compound Interest = A – P = Rs 13891.5 – Rs 12000 = Rs 1891.5

14. Daljit received a sum of Rs. 40000 as a loan from a finance company. If the rate of interest is 7% per annum compounded annually, calculate the compound interest that Daljit pays after 2 years.
Solution:
Given details are,
Principal (p) = Rs 40000
Rate (r) = 7%
Time = 2years
By using the formula,
$A = P (1 + R/100)^n$
$= 40000 (1 + 7/100)^2$
$= 40000 (107/100)^2$

= Rs 45796

∴ Compound Interest = A – P = Rs 45796 – Rs 40000 = Rs 5796