

EXERCISE 14.5

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1. Ms. Cherian purchases a boat for Rs. 16000. If the total cost of the boat is depreciating at the rate of 5% per annum, calculate its value after 2 years.

Solution:

Given details are,

Price of a boat is = Rs 16000

Depreciation rate = 5% per annum

By using the formula,

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

$$= P (1 + R/100)^2$$

Since it is depreciation we use $P (1 - R/100)^n$

$$= 16000 (1 - 5/100) (1 - 5/100)$$

$$= 16000 (95/100) (95/100)$$

$$= 16000 (0.95) (0.95)$$

$$= 14440$$

∴ Value of the boat after two years is Rs 14440

2. The value of a machine depreciates at the rate of 10% per annum. What will be its value 2 years hence, if the present value is Rs 100000? Also, find the total depreciation during this period.

Solution:

Given details are,

Present value of machine is = Rs 100000

Rate of depreciation = 10% per annum

By using the formula,

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

$$= 100000 (1 - 10/100) (1 - 10/100)$$

$$= 100000 (90/100) (90/100)$$

$$= 100000 (0.9) (0.9)$$

$$= 81000$$

Value of machine after two years will be Rs 81000

∴ Total depreciation during this period is Rs (100000 - 81000) = Rs 19000

3. Pritam bought a plot of land for Rs. 640000. Its value is increasing by 5% of its previous value after every six months. What will be the value of the plot after 2 years?

Solution:

Given details are,

Price of land is = Rs 640000

Rate of increase = 5% in every six month

By using the formula,

$$\begin{aligned}A &= P (1 + R/100)^n \\&= 640000 (1 + 5/100) (1 + 5/100) (1 + 5/100) (1 + 5/100) \\&= 640000 (105/100) (105/100) (105/100) (105/100) \\&= 640000 (1.025) (1.025) (1.025) (1.025) \\&= 706440.25\end{aligned}$$

∴ The value of the plot after two years will be Rs 706440.25

4. Mohan purchased a house for Rs. 30000 and its value is depreciating at the rate of 25% per year. Find the value of the house after 3 years.

Solution:

Given details are,

Price of house is = Rs 30000

Depreciation rate is = 25% per year

By using the formula,

$$\begin{aligned}A &= P (1 + R/100)^n \\&= 30000 (1 - 25/100) (1 - 25/100) (1 - 25/100) \\&= 30000 (75/100) (75/100) (75/100) \\&= 30000 (0.75) (0.75) (0.75) \\&= 12656.25\end{aligned}$$

∴ The value of the house after 3 years is Rs 12656.25

5. The value of a machine depreciates at the rate of 10% per annum. It was purchased 3 years ago. If its present value is Rs. 43740, find its purchase price.

Solution:

Given details are,

Present value of machine is = Rs 43740

Depreciation rate of machine is = 10% per annum

Let the purchase price 3 years ago be = Rs x

By using the formula,

$$\begin{aligned}A &= P (1 + R/100)^n \\43740 &= x (1 - 10/100) (1 - 10/100) (1 - 10/100) \\43740 &= x (90/100) (90/100) (90/100) \\43740 &= x (0.9) (0.9) (0.9) \\43740 &= 0.729x \\x &= 43740/0.729 \\&= 60000\end{aligned}$$

∴ The purchase price is Rs 60000

6. The value of a refrigerator which was purchased 2 years ago, depreciates at 12% per annum. If its present value is Rs. 9680, for how much was it purchased?

Solution:

Given details are,

Present value of refrigerator is = Rs 9680

Depreciation rate is = 12%

Let the price of refrigerator 2 years ago be = Rs x

By using the formula,

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

$$9680 = x (1 - 12/100) (1 - 12/100)$$

$$9680 = x (88/100) (88/100)$$

$$9680 = x (0.88) (0.88)$$

$$9680 = 0.7744x$$

$$x = 9680/0.7744$$

$$= 12500$$

∴ The refrigerator was purchased for Rs 12500

7. The cost of a T.V. set was quoted Rs. 17000 at the beginning of 1999. In the beginning of 2000 the price was hiked by 5%. Because of decrease in demand the cost was reduced by 4% in the beginning of 2001. What was the cost of the T.V. set in 2001?

Solution:

Given details are,

Cost of T.V at beginning of 1999 is = Rs 17000

Hiked in price in the year 2000 is = 5%

Depreciation rate in the year 2001 is = 4%

By using the formula,

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

$$= 17000 (1 + 5/100) (1 - 4/100)$$

$$= 17000 (105/100) (96/100)$$

$$= 17000 (1.05) (0.96)$$

$$= 17136$$

∴ The cost of TV set in the year 2001 is Rs 17136

8. Ashish started the business with an initial investment of Rs. 500000. In the first year he incurred a loss of 4%. However during the second year he earned a profit of 5% which in third year rose to 10%. Calculate the net profit for the entire period of

3 years.

Solution:

Given,

Initial investment by Ashish is = Rs 500000

Incurred loss in the first year is = 4%

Profit in 2nd year is = 5 %

Profit in 3rd year is = 10%

By using the formula,

$$\begin{aligned}A &= P (1 + R/100)^n \\ &= 500000 (1 - 4/100) (1 + 5/100) (1 + 10/100) \\ &= 500000 (96/100) (105/100) (110/100) \\ &= 500000 (0.96) (1.05) (1.1) \\ &= 554400\end{aligned}$$

∴ The net profit for the entire period of 3 years is Rs 554400