CHAPTER

8

Depreciation

INTRODUCTION

Buildings, machinery, equipments of all kind, furniture, fixtures, computer, automobiles, electronic items are examples of assets that will last for more than one year, but will not last indefinitely. Value of such asses decreases year by year, on account of wear and tear, exposures, and etc. During each accounting period, a portion of the cost of these assets is being indirectly used up. The portion being used up is reported as depreciation on the income statement of a business concern. It is, therefore, very important for a financial analyst to know how to calculate depreciation. In this chapter, we shall discuss various methods of computing depreciation for a depreciable asset.

DEPRECIATION

The decrease in the value of an asset, which cannot be made by current repairs is called *depreciation.*

The value of depreciable assets at the end of its useful life is called the *scrap value.*

The difference between the original cost of the asset at the time of purchase and the scrap value at the end of its life is called the total *depreciation* of the asset. It is also known as *wearing value* of the asset.

The depreciation is generally computed on yearly basis, *i.e.,* on the basis of every financial year. Computation of annual depreciation depends on the following factors : the original cost, the useful life, and the scrap value of the machine.

One should not be confused with the scrap value and the book value. Scrap value of an asset is the value at end of the life of that asset where as book value of an asset is the value of the asset at a given date, *i.e.,* at the end/beginning of a particular financial year.

Following are the major methods of computing the depreciation :

(*a*) Diminishing Balance Methods.

(*b*) Straight Line Method

(*c*) Sum-of-the-year Digits Method.

Among the above three methods, Diminishing Balance Method is commonly used in business.

DIMINISHING BALANCE METHOD

By this method, the annual depreciation is a constant percentage of the book value of the depreciated asset at the end of the preceding year. This method is also known as constant percentage method or Reducing balance method. The constant percentage must be determined so that the book value of the asset at the end of its estimated life is reduced to the scrap value.

We have already seen that to increase some value by 100 i % we need to calculate the quantity $1 + i$ and if this is done n times, we have to calculate $(1 + i)^n$. A similar argument is applied if we need to decrease some value by 100 i %. Here we need to calculate $1 - i$ and if this is done n times, we have to calculate $(1 - i)^n$

Let r be the rate (constant percentage) of depreciation and C be the original cost of the asset.

At the end of the first year, the depreciation is Cr and the book value $= C - Cr = C\ (1 - r)$

At the end of the second year, the depreciation is $C(1 - r)\ r$ and the book value

$$= C\ (1 - r) - C\ (1 - r)\ r = C\ (1 - r)\ (1 - r) = C\ (1 - r)^2$$

Thus, if the life of the machine is n years, at the end of n years, the book value

$$= C\ (1 - r)^n$$

The book value at the end of the life of the asset is known as scrap value.

Thus, the scrap value S at the end of n years for an asset of original cost C, depreciation being calculated r per annum is given by

$$\boxed{S = C\ (1 - r)^n}$$

The Total depreciation $= C - S$

Remark 1 : To find the depreciation charge for a particular year, say k^{th} year, calculate the depreciation on the book value at the end of the $(k - 1)^{\text{th}}$ year. Another way to find the depreciation for a particular year, say k^{th} year, simply subtract the book value of the asset at the end of k^{th} year (*i.e.* $C\ (1 - r)^{\text{th}}$) from the book value at the end the $(k - 1)^{\text{th}}$ year [*i.e.* $C\ (1 - r)^{k-1}$].

Remark 2 : Changing rate of depreciation : The rate of depreciation may get changed from time to time. If the rate of depreciation is r_1% for first n_1 years and r_2% for next n_2 year and so on and r_k% for the last n_k years, then the depreciate value of an asset worth C at end of n years ($n = n_1 + n_2 + \ldots n_k$) is given by

$$S = C\ (1 - r_1)^{n_1}\ (1 - r_2)^{n_2} \ldots\ldots\ (1 - r_k)^{n_k}$$

Example 1 : *A machine, the life of which is estimated to be 10 years, cost Rs. 10,000. Calculate the scrap value at the end of its life, depreciation on the reducing balance method being charged at 10% per annum.*

Solution **:** The scrap value of an asset is given by

$$S = C(1 - r)^n$$

Here, Cost of machine, C = Rs. 10,000

Rate of depreciation, r = 10% = 0.10

Life of the machine, n = 10 years

$\therefore \quad S = 10{,}000\,(1 - 0.10)^{10}$

$\Rightarrow \quad S = 10{,}000\,(0.90)^{10} = 10{,}000\,(0.348678) = 3486.78$

$\therefore$ The scrap value is Rs. 3,486.78.

Example 2 : *A machine is being depreciated in such a way that the value of the machine at the end of any year is 90% of the value at the beginning of the year. The actual cost of the machine is Rs. 20,000. Calculate scrap value if the machine, if the estimated useful life of the machine is 6 years.*

Solution **:** The value of the machine at the end of any year is 90% of the value of the machine at the beginning of the year.

That is, 10% of the value is the depreciation for a year.

$\therefore \quad r = 10\% = 0.10$

Number of years $n = 6$

Cost of the machine C = Rs. 20,000

The scrap value of an asset worth Rs. C at r% rate of depreciation at the end of n years is given by

$$S = C(1 - r)^n$$

$\therefore$ Here $\quad S = 20{,}000\,(1 - 0.10)^6$

$$S = 20{,}000\,(0.90)^6 = 20{,}000\,(0.531441)$$

$$S = 10{,}628.82$$

$\therefore$ The scrap value is Rs. 10,628.82.

Example 3. *A machine is purchased for Rs. 10,000. Depreciation is calculated at 8% per annum for first 3 years and after that 10% per annum for next 7 years, depreciation being calculated on the diminishing value. Find the value of the machine after 10 years.*

Solution **:** Value of an asset worth C at the end of $n_1 + n_2$ years with depreciation rates of r_1% for n_1 years and r_2% for n_2 years is given by

$$S = C\,(1 - r_1)^{n_1}\,(1 - r_2)^{n_2}$$

Here $\quad n_1 = 3$ years and $n_2 = 7$ years

and $r_1 = 8\% = 0.08$ and $r_2 = 10\% = 0.10$

The cot of the machine C = Rs. 10,000

$\therefore$ $S = 10{,}000\,(1 - 0.08)^3\,(1 - 0.10)^7$

$S = 10{,}000\,(0.92)^3\,(0.90)^7$

$S = 10{,}000\,(0.778688)\,(0.4782969)$

$S = 3{,}724.44$

$\therefore$ Value of the machine after 10 years is Rs. 3,724.44.

Example 4. *A machine costing Rs. 80,000 depreciates at a constant rate of 8% per annum. The life of the machine is estimated to be 15 years.*

(a) What is the value of the machine after 7 years ?

(b) What is the depreciation charge for 10^{th} year ?

Solution : (*a*) Value of the machine after n years is given by $S = C\,(1 - r)^n$

Rate of Depreciation r = 8% = 0.08

Cot of the machine C = Rs. 80,000

n = 7 years

$\therefore$ $S = 80{,}000\,(1 - 0.08)^7$

$\Rightarrow$ $S = 80{,}000\,(0.92)^7 = 80{,}000\,(0.5578466)$

$S = 44627.73$

$\therefore$ The value of the machine after 7 years is Rs. 44,627.73.

(*b*) Depreciation charge for k^{th} year = Value of the machine at the end of $(k-1)^{th}$ year – Value of the machine at the end of k^{th} year.

Here k = 10 years

$\therefore$ Depreciation charge for 10^{th} year

= Value of the machine at the end of 9^{th} year – Value of the machine at the end of 10^{th} year.

Value of the machine at the end of 9^{th} year $= 80{,}000\,(1 - 0.08)^9$

$= 80{,}000\,(0.92)^9$

$= 80{,}000\,(0.47216136)$

$= 37{,}772.91$

Value of the machine at the end of the 10^{th} year $= 80{,}000\,(1 - 0.08)^{10}$

$= 80{,}000\,(0.92)^{10}$

$= 80{,}000\,(0.43438845)$

$= 34{,}751.08$

$\therefore$ The depreciation charge for 10^{th} year

$= 37{,}772.91 - 34{,}751.08 = 3{,}021.83$

The required depreciation charge is Rs. 3,021.83.

Example 5. *A machine depreciates at the rate of 8% of its value at the beginning of a year. The machine was purchased for Rs. 1,00,000 and the scrap realised when sold was Rs. 43,440. Find the number of years the machine was used.*

Solution : Let n be the number of years the machine was used.

The scrap value at the end of the life of an asset is given by

$$S = C(1-r)^n$$

Here scrap value S = Rs. 43,440

Cost of the machine C = Rs. 1,00,000

Rate of depreciation r = 8% = 0.08

Substituting the given values we get

$$43,440 = 1,00,000\,(1-0.08)^n$$

$$\Rightarrow (0.92)^n = \frac{43,440}{1,00,000} = 0.4344$$

Taking log on both sides, we get

$$n \log 0.92 = \log 0.4344$$

$$\Rightarrow \quad n = \frac{\log 0.4344}{\log 0.92}$$

$$\Rightarrow \quad n = \frac{\bar{1}.63789}{\bar{1}.96379} = \frac{-0.36211}{-0.03621} = 10$$

$$\therefore \quad n = 10 \text{ years}$$

$\therefore$ The life of the machine is 10 years.

Example 6. *A machine depreciates at the rate of 7% of its value at the beginning of a year. If the machine was purchased for Rs. 8,500, what is the minimum number of years at the end of which the worth of the machine will be less than or equal to half of its original cost price ?*

Solution : The depreciated value is given by

$$S = C(1-r)^n$$

Cost of the machine C = Rs. 8,500

Rate of depreciation r = 7% = 0.07

According to the given condition,

$$8,500\,(1-0.07)^n \leq \frac{1}{2}(8,500)$$

$$\Rightarrow \quad (1-0.07)^n \leq \frac{1}{2}$$

$$\Rightarrow \quad (0.93)^n \leq 0.5$$

Taking log on both sides we get

$$n \log (0.93) \leq \log 0.5$$

$$\Rightarrow \quad n \leq \frac{\log (0.5)}{\log (0.93)}$$

$$\Rightarrow \quad n \leq \frac{\bar{1}.69897}{\bar{1}.96848} = \frac{-0.30103}{-0.03152} = 9.6 \text{ years}$$

$\therefore$ The minimum number of years = 9.6 years.

Example 7. *A machine costing Rs. 5,600 will depreciate to a scrap value of Rs. 1,951 in 10 years. Given that the depreciation is calculated using diminishing balance method, find the rate of annual depreciation.*

Solution : Let r be rate of annual depreciation.

The scrap value is given by

$$S = C(1-r)^n$$

Here, Scrap value S = Rs. 1,951

Cost of machine C = Rs. 5,600

No. of years n = 10

Substituting these value in the formula, we get

$$1951 = 5{,}600\,(1-r)^{10}$$

$$\Rightarrow \quad (1-r)^{10} = \frac{1{,}951}{5{,}600} = 0.3484$$

Taking log on both sides we get

$$10 \log (1-r) = \log 0.3484$$

$$\Rightarrow \quad \log (1-r) = \frac{\log (0.3484)}{10}$$

$$\Rightarrow \quad \log (1-r) = \frac{\bar{1}.54208}{10} = \frac{-0.45792}{10} = -0.045792 = \bar{1}.954208$$

$$\Rightarrow \quad (1-r) = \text{antilog } (\bar{1}.954208)$$

$$\Rightarrow \quad 1-r = 0.8999$$

$$\Rightarrow \quad r = 1 - 0.8999 = 0.1001 = 10\%$$

$\therefore$ The rate of depreciation is 10%.

Example 8. *A machine depreciates at the ratio of 8% per annum for the first 3 years and then 6% per annum for the next four years. If the value of the machine is Rs. 8,000 initially, find the average rate of depreciation and the depreciated value of the machine at the end of the 7^{th} year.*

Solution : The scrap value at two different ratio of depreciation is given by

$$S = C(1-r_1)^{n_1}(1-r_2)^n$$

Here, $r_1 = 8\% = 0.08$ and $n_1 = 3$

$r_2 = 6\% = 0.06$ and $n_2 = 4$

cost of machine C = Rs. 8,000

$\therefore \quad S = 8{,}000\,(1-0.08)^3\,(1-0.06)^4$

$\Rightarrow \quad S = 8{,}000\,(0.92)^3\,(0.94)^4$

$\Rightarrow \quad S = 8{,}000\,(0.78688)\,(0.780749) = 4{,}863.68$

The depreciate value of the machine is Rs. 4,863.68.

Let r be the average rate of depreciation.

At $r\%$ rate of depreciation Rs. 8,000 depreciate to Rs. 4,863.68 is 7 years

$\therefore \quad 8{,}000\,(1-r)^7 = 4{,}863.68$

$$\Rightarrow \quad (1-r)^7 = \frac{4{,}863.68}{8{,}000} = 0.60796$$

Taking log on both sides

$$7 \log (1-r) = \bar{1}.78390 = -0.2161$$

$$\Rightarrow \quad \log (1-r) = \frac{-0.2161}{7} = -0.03087 = \bar{1}.96913$$

$\Rightarrow \quad 1-r = \text{antilog}\,(\bar{1}.96913)$

$\Rightarrow \quad 1-r = 0.93132$

$\Rightarrow \quad r = 1 - 0.93132 = 0.06868 = 6.87\%$

$\therefore$ The average rate is 6.87%.

Example 9. *A machine depreciates each year by 10% of its value at the beginning of the year. At the end of 4^{th} year, its value is Rs. 1,31,220. Find its original value.*

Solution : Let C be the original value.

The scrap value is given y

$$S = C\,(1-r)^n$$

Here Scrap value S = Rs. 1,31,200

Depreciation rate r = 10% = 0.10

No. of years n = 4

$\therefore \quad 1{,}31{,}220 = C\,(1-0.1)^4$

$\Rightarrow \quad 1{,}31{,}220 = C\,(0.90)^4$

$$\Rightarrow \quad C = \frac{1{,}31{,}20}{(0.90)^4} = \frac{1{,}31{,}22}{0.6561} = \text{Rs. } 2{,}00{,}000.$$

$\therefore$ Original value of the machine is Rs. 2,00,000.

Example 10. *XYZ Ltd. purchases a machinery which costs Rs. 20,000 now. The useful life of the machine is 9 years and the annual rate of depreciation is 6% per annum, depreciation being calculated on diminishing balance method. After 8 years the existing machine has to be replaced by a new one which will cost 25% more than the initial cost of the machine. What amount the company will require at the end of 9^{th} year to replace the existing machine by a new one ?*

Solution :

Cost of machine C = Rs. 20,000

Life of machine n = 9 years

Rate of depreciation r = 6% = 0.06

The scrap value is given by

$$S = C(1-r)^n$$

$\therefore$ $S = 20{,}000\,(1-0.06)^9$

$\Rightarrow$ $S = 20{,}000\,(0.94)^9$

$\Rightarrow$ $S = 20{,}000\,(0.5729948) = 11{,}460$

$\therefore$ The value of the machine at the end of 9th year is Rs. 11,460.

The cost of new machine at the end of 9th year = Initial cost + 25% of the initial cost

= 20,000 + 25% of 20,000

= 20,000 + 5,000 = Rs. 25,000

The amount required to replace the old machine = The cost of new machine − Scrap value of the old machine

$\therefore$ The required amount is Rs. 13,540 = Rs. 25,000 − Rs. 11,460 = Rs. 13,540.

STRAIGHT LINE METHOD

In the diminishing balance method, the depreciation for one year will not be the same as that of the previous year. The depreciation was calculated on constant percentage. By straight line method, the annual depreciation of an asset is found by dividing the total depreciation by the number of years in its estimated useful life.

Thus, by straight line method depreciation per year is calculated as follows :

$$D = \frac{C-S}{n}$$

In this method, the depreciation for every year will be unique through out the life of the asset.

Example 11. *A machine costing Rs. 30,000 is expected to have a useful life of 5 years and a final scrap value of Rs. 10,000. Using straight line method, find the annual depreciation and construct the depreciation schedule.*

Solution : Using straight line method the annual depreciation is given by :

$$D = \frac{C-S}{n}$$

Here C = Rs. 30,000, S = Rs. 10,000 and n = 5 years

$\therefore$ $$D = \frac{3{,}000 - 10{,}000}{5} = 4{,}000$$

$\therefore$ The annual depreciation is Rs. 4,000.

The book value at the beginning of the 1st year is Rs. 30,000. Depreciation for 1st year is Rs. 4,000.

$\therefore$ The book value at the beginning of the 2nd year is Rs. 26,000 (Rs. 30,000 – Rs. 4,000). Depreciation for second year is Rs. 4,000.

$\therefore$ The book value at the beginning 3rd year is Rs. 22,000 (Rs. 26,000 – Rs. 4,000)

In this manner, we calculate the book value of the machine at the beginning of every year. These are shown in the following table :

Year	*Bank value at the beginning of the year*	*Depreciation for that year*	*Accumulated Depreciation*	*Value of machine at the end of the year*
1	Rs. 30,000	Rs. 4,000	Rs. 4,000	Rs. 26,000
2	Rs. 26,000	Rs. 4,000	Rs. 8,000	Rs. 22,000
3	Rs. 22,000	Rs. 4,000	Rs. 12,000	Rs. 18,000
4	Rs. 18,000	Rs. 4,000	Rs. 16,000	Rs. 14,000
5	Rs. 14,000	Rs. 4,000	Rs. 20,000	Rs. 10,000

Example 12. *A machine costing Rs. 50,000 has a useful life of 4 years and the machine has no scrap value at the end of its life. Using the straight line method, find the annual depreciation.*

Solution : Using straight line method, the annual depreciation is given by

$$D = \frac{C - S}{n}$$

Hence C = Rs. 50,000, $S = 0$ and $n = 4$ years

$$\therefore \quad D = \frac{50,000 - 0}{4} - \frac{50,000}{4} = 12,500$$

$\therefore$ the annual depreciation is Rs. 12,500.

SUM-OF-THE-YEARS-DIGITS METHOD

By this method, a greater fraction of the cost of the asset is depreciated in earlier years of the life of the asset. The fraction of the asset to be depreciated each year is determined by putting the digit of the year in reverse order over the sum of the digits of the life period.

For **Example** if the life of the asset is 4 years, then the depreciation for each year is calculated in the ratio 4 : 3 : 2 : 1.

In other words, the depreciation is calculated in the order $\frac{4}{10}, \frac{3}{10}, \frac{2}{10}$ and $\frac{1}{10}$.

Example 13. *A machine which costs Rs. 20,000 is expected to have a useful life of 5 years and a scrap value of Rs. 5,000. Find the annual depreciation and form a depreciation schedule using sum-of-the-years-digits method.*

Solution : Cost of the machine C = Rs. 20,000
Scrap value S = Rs. 5,000
No. of years $n = 5$

$\therefore$ Total depreciation for five years = Rs. 20,000 – Rs. 5,000 = Rs. 15,000.

The annual depreciation is calculate in the ratio 5 : 4 : 3 : 2 : 1

i.e. in the order $\frac{5}{15}, \frac{4}{15}, \frac{3}{15}, \frac{2}{15}, \frac{1}{15}$

Now we prepare the depreciation schedule

Years	*Fraction of Assets to be depreciated*	*Annual depreciation*	*Accumulated depreciation*
1	$\frac{5}{15}$	$\frac{5}{15} \times 15{,}000$ = Rs. 5,000	Rs. 5,000
2	$\frac{4}{15}$	$\frac{4}{15} \times 15{,}000$ = Rs. 4,000	Rs. 9,000
3	$\frac{3}{15}$	$\frac{3}{15} \times 15{,}000$ = Rs. 3,000	Rs. 12,000
4	$\frac{2}{15}$	$\frac{2}{15} \times 15{,}000$ = Rs. 2,000	Rs. 14,000
5	$\frac{1}{15}$	$\frac{1}{15} \times 15{,}000$ = Rs. 1,000	Rs. 15,000

EXERCISES

1. A machine, the life of which is estimated to be 15 years, costs Rs. 40,000. Calculate the scrap value at the end of its life, depreciation on the diminishing balance system being calculated at 10% per annum. [**Ans.** Rs. 8,236]
2. A machine costing Rs. 5,000 depreciates at a constant rate of 5%. If the estimated useful life of the machine is 15 years, determine its scrap value. [**Ans.** Rs. 2,316]
3. A machine, the life of which is estimated at 10 years, costs Rs. 6,000. Calculate the scrap value at the end of its life, depreciation on the reducing balance system being charged 7% per annum. [**Ans.** Rs. 2,904]
4. A machine is being depreciated in such a way that the value of the machine at the end of any year is 95% of the value at the beginning of the year. The actual cost of the machine is Rs. 15,000. Calculate the scrap value of the machine, if the estimated useful life of the machine is 8 years. [**Ans.** Rs. 9,951.31]
5. An asset is purchased for Rs. 10,000. It is depreciated at a constant rate of 6% for the first 4 years and after that 10% for the next 6 years. Find the value of the asset after a period of 10 years. [**Ans.** Rs. 4,149.76]
6. A machine depreciates at the rate of 10% per annum for the first two years and then 7% per annum for the next three years, depreciation being calculated on the diminishing value. If the value of the machine is Rs. 10,000 initially, find the depreciated value of the machine at the end of the 5th year ? [**Ans.** Rs. 6,515.60]
7. An item costing Rs. 50,000 depreciates at a constant rate of 8% per annum. The useful life of the machine is 10 years. What is the depreciation charge for the 8th year? [**Ans.** Rs. 2,231.39]

8. A machine costing Rs. 30,000 depreciates at a constant rate of 12% per annum, depreciation being calculate on the diminishing value.

(a) What is the value of the machine after 5 years ?

(b) What is the depreciation charge for the 7^{th} year ?

[**Ans.** Rs. 15,832, (b) Rs. 1,671.86]

9. A machine costing Rs. 5,000 depreciates at a constant rate of 5% per annum. What is the depreciation charge for the 5^{th} year ? [**Ans.** Rs. 203.50]

10. An item being depreciated in such a way that the value of the item at the end of any year is 90% of the value at the beginning of the year. The cost of the item is Rs. 40,000 and it was sold eventually as waste material for Rs. 15,000 at the end of its life. Obtain the number of years the item was in use. [**Ans.** 9.3 years]

11. A machine depreciates at the 10% of its value at the beginning of the year. The machine was purchased for Rs. 44,000 and the scrap value realised when sold was Rs. 25,981.56. Find the number of years the machine was used. [**Ans.** 5 years]

12. A machine depreciated at the rate of 8% of its value at the beginning of a year. If the machine was purchased for Rs. 15,000, what is the minimum number of complete years at the end of which the worth of the machine will not exceed $(2/5)^{th}$ of its original value. [**Ans.** 11 years]

13. A machine depreciates at the rate of 10% per annum rate of depreciation. If the purchasing price of the machine is Rs. 10,000, what will be the minimum number of completed years at the end of which the worth of the machine will be less than or equal to quarter of its original cost price ? [**Ans.** 13.16 years]

14. A machine worth Rs. 12,000 is depreciated at the rate of 10% per annum. It was sold eventually as waste metal for Rs. 200. Find the number of years during which the machine was in use. [**Ans.** 38.84 years]

15. An article, the life of which is estimated to be 10 years, costs Rs. 10,000. The scrap value realised at the end of its life is Rs. 3,483.37. If the depreciation is calculate on the diminishing balance method, what is the rate of annual depreciation ?

[**Ans.** 10%]

16. A machine costing Rs. 8,000 would reduce to Rs. 2,000 is 8 years. Find the rate of yearly depreciation, given that the depreciation is calculated using diminishing balance method. [**Ans.** 15.91%]

17. An asset costing Rs. 2,000 will depreciate to a scrap value of Rs. 160 in 10 years. Find the rate of depreciation. [**Ans.** 22.33%]

18. A machine depreciates at the rate of 10% per annum for the first two years and then 7% per annum for the next three years, depreciation being calculated on diminishing value. If the value of the machine be Rs. 10,000 initially, find the average rate of depreciation and the depreciate value of the machine at the end of 5^{th} year.

[**Ans.** Rs. 6,515.29, 8.2%]

19. What the average rate of depreciation equivalent to 9% annual rate of depreciation for 3 years and 7% annual rate of depreciation for next 2 years, if the depreciation is calculated for 5 years. [**Ans.** 8.22%]

20. A machine depreciates each year by 10% of its value at the beginning of the year. At the end of 2nd year, its value is Rs. 5,536.47. Find its original value. [**Ans.** Rs. 6,000]

21. The value of a machine depreciates at the rate of 11% annually. If its present value is Rs. 38,440, find its value three years age. [**Ans.** Rs. 54,527.22]

22. A machine costing Rs. 60,000 has a useful life of 5 years. The scrap value is Rs. 20,000. Using straight line method, find the annual depreciation and construct a schedule for depreciation. [**Ans.** Rs. 8,000]

23. An asset costing Rs. 12,000 is expected to have a useful life of 6 years and a scrap value of Rs. 3,000. Find the annual depreciation charge using straight line method.

[**Ans.** Rs. 1,500]

24. A machine costing Rs. 10,000 is expected to have a useful life of 5 years. It is assumed that the scrap value is nil. Using straight line method, find the annual depreciation charge. [**Ans.** Rs. 2,000]

25. A machine costing Rs. 25,000 is expected to have a useful life of 4 years. It is assumed that the scrap value at the end of 4th year is Rs. 5,000. find the annual depreciation and prepare the depreciation schedule using sum-of the years-digit method. [**Ans.** Rs. 8,00, Rs. 6,000, Rs. 4,000 and Rs. 2,000]

26. An asset costs Rs. 3,000. The useful life of the asset is 5 years and there is no scrap value. Find the annual depreciation and prepare a depreciation schedule using sum-of-the-years-digit method. [**Ans.** Rs. 1,000, Rs. 800, Rs. 600, Rs. 400, Rs. 200]

27. A computer whose cost is Rs. 4,40,000 will depreciate to a scrap value of Rs. 24,000 in 5 years.

(*a*) If the reducing balance method of depreciation is used, find the depreciation rate.

(*b*) What is the book value of the computer at the end of the third year ?

(*c*) How much more would the book value be at the end of the third year, if straight line method of depreciation has been used ?

[**Ans.** (*a*) 44.11%, (*b*) Rs. 76,816.59, (*c*) Rs. 1,13,583]

28. A company buys a computer for Rs. 1,25,000 and houses it in a specially constructed suite at a cost of Rs. 20,000.

(*a*) If the computer depreciates at 25% (reducing balance) and the suite appreciates 5% compound, what is the book value of the suite and the computer after 5 years,

(*b*) Taking computer and suite together and using the reducing balance method, what is the overall depreciation rate ? [**Ans.** (*a*) Rs. 55,188.71, (*b*) 17.57%]

29. *ABC* Ltd. purchases a machine which cost Rs. 12,000 now. The useful life of the machine is 10 years. The rate of depreciation is 6%, depreciation being calculate on diminishing balance method. What is the scrap value of the machine at the end of its life ? If after 10 years, the existing machine has to be replaced by a new machine which cost 20% more than the cost of the old machine, what amount will be required at the end of the 10th year to replace the old machine by a new one ? [**Ans.** 7,936.62]