UNIVERSITI TEKNOLOGI MARA

UiTM di hatiku

DEPRECIATION

Prepared by:
Mathematical Science Department

LEARNING OUTCOMES

By the end of this chapter, student should be able to :

- explain the concept of depreciation,
- Identify the terms used and its meaning related to depreciation,
- differentiate the two methods used in this chapter,
- calculate the depreciation using on straight line method,
- calculate the depreciation using declining balance method.

DEPRECIATION

Definition:

Depreciation is defined as the loss in value of capital assets such as vehicles, machinery tools and equipment due to usage over time.

Thus, in general the term depreciation refers to fall in the value or utility of fixed assets which are used in operations over the definite period of years. In other words, depreciation is the process of spreading the cost of fixed assets over the number of years during which benefit of the asset is received.

The fall in value or utility of fixed assets due to so many causes like wear and tear, decay, effluxion of time or obsolescence, replacement, breakdown, fall in market value etc.

FACTORS AFFECTING THE AMOUNT OF DEPRECIATION

The following factors are to be considered while charging the amount of depreciation :

(1) The original cost of the asset.

(2) The useful life of the asset.

(3) Estimated scrap or residual value of the asset at the end of its life.

(4) Selecting an appropriate method of depreciation.

IMPORTANT TERMS

- ***Original cost (C)*** **:** The *cost paid for the item* including any sales tax, transportation charges, installation charges and other cost that incurred.
- ***Salvage cost (S)*** **:** *Cost at the end of its lifetime*. It is also called *scrap-value* or *trade-in-value* or *junkyard*.
- ***Useful life (n)*** : *life expectancy* or the number of years the asset is expected to last. Sometimes called as economic life.
- ***Book value (BV)*** **:** The *difference* between the *original cost* and the *accumulated depreciation to that date*. May also refer as the market value or market price of an asset at certain years.
- ***Total depreciation*** : difference between original cost and the salvage value.
- ***Annual depreciation*** : the amount of depreciation in a year.
- ***Accumulated depreciation*** : the total depreciation to date.

METHOD OF DEPRECIATION
1. STRAIGHT LINE METHOD

This method is also termed as Constant Charge Method. Under this method, depreciation is charged for every year will be the constant amount throughout the life of the asset.

Accordingly depreciation is calculated by deducting the scrap value from the original cost of an asset and the balance is divided by the number of years estimated as the life of the asset.

$$\text{Depreciation} = \frac{\text{Total Cost of an Asset} - \text{Scrap value}}{\text{Estimated life of asset}}$$

Source: https://corporatefinanceinstitute.com/resources/knowledge/accounting/types-depreciation-methods/

IMPORTANT FORMULA USED IN STRAIGHT LINE METHOD

$$\text{Annual Depreciation}(AD) = \frac{\text{Cost} - \text{Scrap Value}}{\text{Useful Life}} = \frac{C - S}{n}$$

$$\text{Annual Rate of Depreciation} = \frac{\text{Annual Depreciation}}{\text{Total Depreciation}} x\,100\% = \frac{AD}{TD} x\,100\%$$

or

$$\text{Annual Rate of Depreciation} = \frac{1}{\text{Useful Life}} x\,100\% = \frac{1}{n} x\,100\%$$

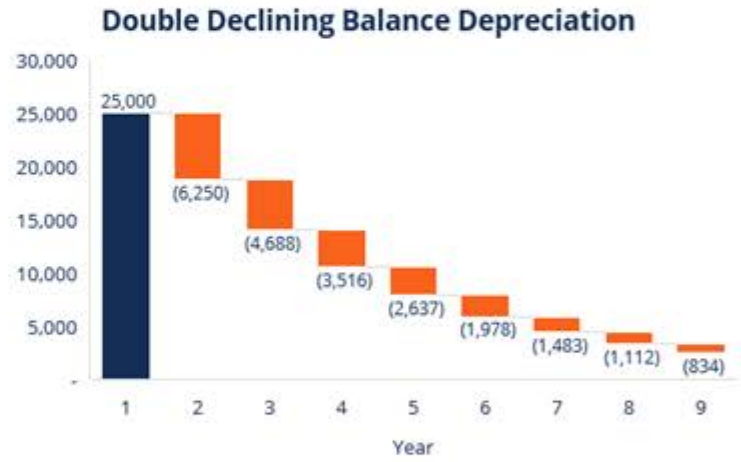
$$\text{Book Value}(BV_n) = \text{Cost} - \text{Accumulated Depreciation} = C - nAD$$

METHOD OF DEPRECIATION
2. DECLINING BALANCE METHOD

The declining balance method produces the highest depreciation charges in the earlier years of the asset .

The book value of the asset remaining at the end of the depreciation year becomes the scrap value.

Year	Book value of asset, beginning of the year	Rate of declining balance	Depreciation expense	Balance accumulated depreciation	Book value of asset, end of the year
1	500,000	40%	200,000	200,000	300,000
2	300,000	40%	120,000	320,000	180,000
3	180,000	40%	72,000	392,000	108,000
4	108,000	40%	43,200	435,200	64,800
5	64,800	40%	14,800*	450,000	50,000



Source: https://corporatefinanceinstitute.com/resources/knowledge/accounting/types-depreciation-methods/

IMPORTANT FORMULA USED IN DECLINING BALANCE METHOD

$$Rate\ of\ Depreciation(r) = 1 - \sqrt[n]{\frac{S}{C}}$$ or $$Rate\ of\ Depreciation(r) = 1 - \sqrt[n]{\frac{BV}{C}}$$

$$Accumulated\ Depreciation_n(AcD_n)$$
$$= Cost - Book\ Value$$
$$= C - C(1-r)^n$$

$$Book\ Value(BV_n)$$
$$= C(1-r)^n$$

n = useful life in years

S =salvage value

C =cost

Example 1

Fantastic laundry bought a washing machine at RM10,000. It is estimated to last for 5 years and has salvage value of RM2,000. Find

i) the book value of the washing machine after 3 years using the straight line method

ii) the annual rate and the amount of depreciation of the washing machine for the third year by using the declining balance method.

SOLUTION

$C = 10000; n = 5; S = 2000$

i) Annual Depreciation (AD)

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

$$= \frac{10000 - 2000}{5}$$

$$= \text{RM}1600$$

Book Value (BV_3)

$$= C - 3AD$$

$$= 10000 - 3(1600)$$

$$= RM\,5200$$

ii) Annual Rate (r)

$$= 1 - \sqrt[5]{\frac{2000}{10000}}$$

$$= 1 - 0.7248$$

$$= 0.2752$$

Accumulated Depreciation (AcD_3)

$$= C - C(1-r)^3$$

$$= 10000 - 10000(1 - 0.2752)^3$$

$$= 10000 - 3807.63$$

$$= RM\,6192.37$$

Accumulated Depreciation (AcD_2)

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

$$= 10000 - 10000(1 - 0.2752)^2$$

$$= RM\,4746.65$$

Amount of Depreciation for 3rd year

$$= AcD_3 - AcD_2$$

$$= 6192.37 - 4746.65$$

$$= RM1445.72$$

Example 2

Five years ago, Salleh bought a tractor, which currently has a value RM8,500. This tractor has a life expectancy of another 15 years. At the end of its life, the tractor will have a value of RM5,000. By using the straight line method, calculate the cost of the tractor. Then, calculate its annual depreciation.

SOLUTION

$BV_5 = 8500, n = 20, S = 5000$

$BV_5 = C - 5AD$

$8500 = C - 5AD \rightarrow (1)$

$S = BV_{20} = 5000$

$BV_{20} = C - 20AD$

$5000 = C - 20AD \rightarrow (2)$

$(2) - (1)$

$-3500 = -15AD$

$$AD = \frac{-3500}{-15} = 233.33$$

Replace AD $= 233.33$ into (1)

$8500 = C - 5(233.33)$

$C = 8500 + 1166.65$

$C = RM\,9666.65$

Exercise

1. The depreciation for the third year of a machine is RM5,000. If the annual rate of depreciation is 2%, find the cost for the machine using declining balance method.
2. Raju owns Asset 1 and Asset 2 where details are given as follows:

Item	Asset 1	Asset 2
Cost (RM)	25,530	25,000
Annual rate of depreciation (%)	20	k
Method of depreciation	Straight Line	Declining Balance

i) The total depreciation for Asset 1 over its useful life is estimated to be RM12,000, calculate the price that should be offered by Raju if he wishes to sell the asset after using it for 5 years.

ii) Find the value of k if the book value of Asset 2 at the third year is RM15,000.