

Depreciation

DIB Question Solution

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Depreciation

Depreciation in accounting refers to an indirect and explicit cost that a company incurs every year while using a fixed asset such as equipment, machinery, or expensive tools. It is the depleting value of a tangible asset. In the case of intangible assets, the act of depreciation is called amortization. Thus-

- Depreciation is a decrease in the book value of fixed assets.
- Depreciation involves loss of value of assets due to the passage of time and obsolescence.
- Depreciation is an ongoing process until the end of the life of assets.

Depreciation in Accounting

Companies depreciate to allocate the cost of a **tangible asset**, over its **useful life**. When the asset is used, wear and tear occur from erosion, dust, and decay. Despite proper maintenance and precaution, it is impossible to preserve the original form and quality of the asset. Therefore, depreciation expense is used to recognize the amount of wear and tear. Firms depreciate because the technology used in the machine may become obsolete, or the asset may become inoperable due to an accident.

In depreciation, there is no cash outflow. Instead, while accounting, this expense is transferred to the **accumulated depreciation**. It is an essential part of accounting that facilitates companies to record the real-time **book value** of tangible assets. Also, this sum can be used for purchasing a new asset in the future. Now, let us understand some of the terminologies used in this concept:

- **Fixed Asset Cost:** It is the cost at which the organization buys a tangible asset.
- **Salvage Value:** The residual cost can be recovered from selling the asset after its useful life.
- **Useful Life of Fixed Asset:** It is the estimated number of years for which an asset remains productive and efficient.
- **Depreciation Rate:** It is the percentage charged as depreciation on the fixed asset.

Causes of depreciation

Physical Deterioration-This physical deterioration leads to a decrease in the asset's value.

Obsolescence-Technological advancements can quickly render certain assets obsolete.

Expiry of Useful Life

Depletion-Natural resources

Accidental Damage or Breakdown

Deterioration of Quality

Environmental Factors

Factors affecting depreciation

- **The original Cost of the asset.**
- **The estimated salvage value at the end of its life**
- **The estimated useful life of the asset**
- **The amount to be expended to make the assets workable say, transport cost, installation cost, sale tax, training cost, assembling cost etc.**
- **Depreciation Method to be used**
- **Market Conditions**
- **Technological Advancements**

Capital Expenditure Vs Revenue Expenditure

- Capital expenditures (CAPEX) are funds used by a company to acquire, upgrade, and maintain physical assets such as equipment.
- Capital expenditures are typically one-time large purchases of fixed assets that will be used for revenue generation over a longer period.
- Revenue expenditures are the ongoing operating expenses, which are short-term expenses used to run the daily business operations.

Types of Revenue Expenditures:

Salary & wages, Utilities, Overhead Expenses

Types of Capital Expenditures:

Factory upgrade or expansion, Vehicles, Manufacturing equipment

Capital Expenditure Vs Revenue Expenditure

Particulars	Capital Expenditure	Revenue Expenditure
Definition	Expenditure is incurred to acquire assets, and enhance the capacity of an existing asset resulting in increasing its lifespan	Expense incurred to maintain the day to day business activities
Tenure	Long term	Short term
Value Addition	Enhances the existing asset value	Does not enhance the existing asset value
Physical Presence	Has a physical presence except for intangible assets	Does not have a physical presence
Occurrence	Non-recurring in nature	Recurring in nature
Availability of Capitalization	Yes	No
Impact on Revenue	Do not reduce business revenue	Reduce business revenue
Potential Benefit	Long-term benefits for business	Short-term benefits for business
Appearance	Appears as assets in the balance sheet and some portion in the income statement	Always appears in the income statement

Impact of wrong classification

- XYZ limited purchased a machine for its production process on 01.01.2021 for an amount of Tk. 1500,000 of which economic life is 03 years. At the end of the year 2021 it is found that the Accountant wrongly classified the value of the machine as revenue expenditure.

What is the financial impact?

Impact of wrong classification

Answer:

Since the machine has been purchased for production process and economic life is 03 years it must be treated as capital expenditure(Fixed Asset). But the accountant classified it as revenue expenditure. i.e. Tk. 15,00,000 has been considered as expenses for the year 2021 instead of Tk. 5,00,000. In the year 2021 the profit is understated by Tk. 10,00,000 and next two years will be overstated by Tk. 500,000 each.

Types of Depreciation Methods

All tangible assets depreciate with time. Therefore, firms use the following five methods to charge for it.

1

• **Straight-Line Method**

2

• **Declining Balance Method**

3

• **Double Declining Balance Method**

4

• **Units of Production Method**

5

• **Sum-of-Years Digits Method**

Straight-Line Method

This is the simplest method of calculating used most of the time. In SLM, a constant depreciation amount is charged every year. First, corporations have to estimate the salvage (residual) value. The **salvage value** represents the cost the company expects to recover at the end of the machine's useful life. After deducting this residual value from the fixed asset cost, the value acquired is divided by the useful life of the **fixed assets**.

Formula:

$$\text{Depreciation} = \frac{(\text{Cost} - \text{Salvage Value})}{\text{No. of Years in Useful Life}}$$

Declining Balance Method

In this method, the depreciated percentage is charged on the net book value of a fixed asset. This net book value is the remaining balance of fixed asset cost after deducting the overall depreciation charged for the previous years. Thus, the depreciable value diminishes every year, and so does the depreciated expense.

Formula:

Depreciation = Net Book Value X Rate of Depreciation (SLR)

Last year additional Depreciation = (Net Book Value – Salvage Value)

Double Declining Balance Method

This method works similar to the **declining balance method**; however, it charges double the depreciated rate on the fixed asset's balance or net book value. Therefore, it is also known as an **accelerated method**.

Formula:

$$\text{Depreciation per year} = \frac{\{(Cost - Accumulated Depreciation) \times 2\}}{\text{No. of Years in Useful Life}}$$

Or,

$$\text{Depreciation per year} = 2 \times (Cost - Accumulated Depreciation) \times \frac{100\%}{\text{No. of Years (Estimated Life)}}$$

$$= 2 \times \text{Net Book Value} \times \text{Straight Line Rate (SLR)}$$

Units of Production Method

Under this method, the fraction of the number of fixed asset units (machinery) produced per year and the total number of units generated in a lifetime is multiplied with the fixed asset cost to yield the depreciated expense of each year. Hence, if the production decreases, the depreciated cost also steeps down and vice versa.

Formula:

$$\text{Depreciation per Unit} = \frac{\text{Fixed Asset Cost} - \text{Salvage Value}}{\text{Total No. of Units Produced during the Useful Life}}$$

$$\text{Depreciation} = \text{No. of Units Produced in Given Year} \times \text{Depreciation per Unit}$$

Sum-of-Years Digits Method

As the name indicates, this method takes the total useful years. Here the digits are arranged in descending order. Then the remaining number of useful years are divided by this sum and multiplied by 100 to get the depreciated rate for the particular year. Finally, the depreciated expense is computed by multiplying this rate with the remaining fixed asset cost after deducting the salvage value.

Formula:

$$\text{Depreciation} = \left[\frac{\text{Useful Life Remaining}}{\text{Sum of Years Digits}} \times 100 \right] \times \text{Depreciable Fixed Asset}$$

Or,

$$\begin{aligned} \text{Depreciation} &= (\text{Cost} - \text{Salvage Value}) \times \frac{\text{Years in Reverse Order}}{\text{Sum of Years Digit (SYD)}} \\ &= (\text{Cost} - \text{Salvage Value}) \times \frac{\text{Years in Reverse Order}}{n(n+1)/2} \end{aligned}$$

May– 2024 (Question no. 3c)

'X' company purchased a factory machine of Tk.21,00,000 on January 1, 2019. The machine is expected to have a salvage value of Tk.75,000 at the end of its 5 years useful life. Prepare schedule of depreciation on the basis of following methods:

- i. Straight Line Method
- ii. Diminishing Balance Method; and
- iii. Sum of Year-Digit Method

May– 2024 (Question no. 3c) **Straight Line Method**

Formula:

Depreciation = (Cost – Salvage Value) ÷ No. of Years in Useful Life

Given that,

Cost = Tk. 21,00,000/-

Salvage Value = Tk. 75,000/-

No. of Years in Useful Life = 5

So, Depreciation per year = Tk. (21,00,000 – 75,000) ÷ 5

= Tk. 20,25,000 ÷ 5

= Tk. 4,05,000/-

May– 2024 (Question no. 3c)

Reducing Balance Method

Year	Depreciation Base (Tk.)	Depreciation per year @ 20% (Tk.)	Accumulated Depreciation/ (Tk.)	Book Value (Tk.)
1	21,00,000	4,20,000	4,20,000	16,80,000
2	16,80,000	3,36,000	7,56,000	13,44,000
3	13,44,000	2,68,800	10,24,800	10,75,200
4	10,75,200	2,15,040	12,39,840	8,60,160
5	8,60,160	1,72,032	14,11,872	6,88,128
5		6,13,128	20,25,000	<u>75,000</u>

May– 2024 (Question no. 3c)

Sum-of-Years Digit Method

Formula:

$$\text{Depreciation} = (\text{Cost} - \text{Salvage Value}) \times (\text{Years in Reverse Order} \div \text{SYD})$$

Where,

$$\begin{aligned} \text{SYD} = \text{Sum of Years Digit} &= n(n+1) \div 2 = 5(5+1) \div 2 \\ &= 15 \end{aligned}$$

Given that,

$$\text{Cost} = \text{Tk. } 21,00,000/-$$

$$\text{Salvage Value} = \text{Tk. } 75,000/-$$

$$\text{No. of Years in Useful Life (n)} = 5$$

$$\begin{aligned} \text{So, Depreciation 1}^{\text{st}} \text{ year} &= \text{Tk. } \{(21,00,000 - 75,000) \times (5 \div 15)\} \\ &= \text{Tk. } (20,25,000 \times 0.333) \\ &= \text{Tk. } 6,75,000/- \end{aligned}$$

Sum of Years Digit Method Contd...

$$\begin{aligned}\text{Depreciation 2}^{\text{nd}} \text{ year} &= \text{Tk. } \{(21,00,000 - 75,000) \times (4 \div 15)\} \\ &= \text{Tk. } (20,25,000 \times 0.267) \\ &= \text{Tk. } 5,40,000/-\end{aligned}$$

$$\begin{aligned}\text{Depreciation 3}^{\text{rd}} \text{ year} &= \text{Tk. } \{(21,00,000 - 75,000) \times (3 \div 15)\} \\ &= \text{Tk. } (20,25,000 \times 0.2) \\ &= \text{Tk. } 4,05,000/-\end{aligned}$$

$$\begin{aligned}\text{Depreciation 4}^{\text{th}} \text{ year} &= \text{Tk. } \{(21,00,000 - 75,000) \times (2 \div 15)\} \\ &= \text{Tk. } (20,25,000 \times 0.133) \\ &= \text{Tk. } 2,70,000/-\end{aligned}$$

$$\begin{aligned}\text{Depreciation 5}^{\text{th}} \text{ year} &= \text{Tk. } \{(21,00,000 - 75,000) \times (1 \div 15)\} \\ &= \text{Tk. } (20,25,000 \times 0.067) \\ &= \text{Tk. } 1,35,000/-\end{aligned}$$

October– 2023 (Question no. 3b)

M/s Karim enterprise purchased a new machine at a cost of BDT 15,00,000 at the beginning of the year. It has an estimated economic life of 5 years with salvage value of BDT 200,000. You are asked to determine the depreciation of the machine under :

- i. Straight Line Method
- ii. Sum-of-Years Digit Method
- iii. Unit of Activity Method (Assumed that production would be 1st year = 200,000 units, 2nd year= 180,000 units, 3rd year= 150,000 units, 4th year= 130,000 and 5th year =100,000 units)

Solution

Straight Line Method

Formula:

Depreciation = (Cost – Salvage Value) ÷ No. of Years in Useful Life

Given that,

Cost = Tk. 15,00,000/-

Salvage Value = Tk. 2,00,000/-

No. of Years in Useful Life = 5

So, Depreciation per year = Tk. (15,00,000 – 2,00,000) ÷ 5

= Tk. 13,00,000 ÷ 5

= Tk. 2,60,000/-

Solution

Sum-of-Years Digit Method

Formula:

$$\text{Depreciation} = (\text{Cost} - \text{Salvage Value}) \times (\text{Years in Reverse Order} \div \text{SYD})$$

Where,

$$\text{SYD} = \text{Sum of Years Digit} = n(n+1) \div 2 = 5(5+1) \div 2 = 15$$

Given that,

$$\text{Cost} = \text{Tk. } 15,00,000/-$$

$$\text{Salvage Value} = \text{Tk. } 2,00,000/-$$

$$\text{No. of Years in Useful Life (n)} = 5$$

$$\begin{aligned} \text{So, Depreciation 1}^{\text{st}} \text{ year} &= \text{Tk. } \{(15,00,000 - 2,00,000) * (5 \div 15)\} \\ &= \text{Tk. } (13,00,000 \times 0.33) \\ &= \text{Tk. } 4,33,333/- \end{aligned}$$

Sum of Years Digit Method Contd...

$$\begin{aligned}\text{Depreciation 2}^{\text{nd}} \text{ year} &= \text{Tk. } \{(15,00,000 - 2,00,000) \times (4 \div 15)\} \\ &= \text{Tk. } (13,00,000 \times 0.267) \\ &= \text{Tk. } 3,46,667/-\end{aligned}$$

$$\begin{aligned}\text{Depreciation 3}^{\text{rd}} \text{ year} &= \text{Tk. } \{(15,00,000 - 2,00,000) \times (3 \div 15)\} \\ &= \text{Tk. } (13,00,000 \times 0.2) \\ &= \text{Tk. } 2,60,000/-\end{aligned}$$

$$\begin{aligned}\text{Depreciation 4}^{\text{th}} \text{ year} &= \text{Tk. } \{(15,00,000 - 2,00,000) \times (2 \div 15)\} \\ &= \text{Tk. } (13,00,000 \times 0.1) \\ &= \text{Tk. } 1,73,333/-\end{aligned}$$

$$\begin{aligned}\text{Depreciation 5}^{\text{th}} \text{ year} &= \text{Tk. } \{(15,00,000 - 2,00,000) \times (1 \div 15)\} \\ &= \text{Tk. } (13,00,000 \times 0.067) \\ &= \text{Tk. } 86,667/-\end{aligned}$$

Solution

Unit of Activity Method

Formula:

Depreciation per Unit = (Cost - Salvage Value) ÷ Estimated Output by Asset

Given that,

Cost = Tk. 15,00,000/-

Salvage Value = Tk. 2,00,000/-

No. of Years in Useful Life = 5

Expected Units of Production = 7,60,000

So, Depreciation per Unit = (Cost - Salvage Value) ÷ Estimated Production Units
= Tk. {(15,00,000 – 2,00,000) ÷ 7,60,000}
= Tk. 1.71053

Unit of Activity Method Contd...

Year	Depreciation Base	Depreciation per unit	Assumed units of production in the year	Depreciation for the year
1 st	13,00,000	1.71053	2,00,000	3,42,105
2 nd			1,80,000	3,07,895
3 rd			1,50,000	2,56,579
4 th			1,30,000	2,22,368
5 th			1,00,000	1,71,053
Total			7,60,000	13,00,000

May – 2023 (Question no. 4c)

ABC Company purchased a machinery on January 01, 2020 at a price of Tk. 6,50,000/-, useful life of which is 5 years and residual value is Tk. 50,000/-. The transportation cost of the machine was Tk. 20,000/- and the installation cost was Tk. 30,000/-.

Calculate depreciation for the machinery under Diminishing Balance Method.

Solution

Diminishing Balance Method

Depreciation Base = Price + Transportation Cost + Installation Cost = Tk. (6,50,000 + 20,000 +30,000) = Tk. 7,00,000/-	Straight Line Rate = 100% ÷ 5 years = 20%
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Year	Depreciation Base (Tk.)	Depreciation per year @ 20% (Tk.)	Accumulated Depreciation/ Salvage Value (Tk.)	Book Value (Tk.)
1	7,00,000	1,40,000	1,40,000	5,60,000
2	5,60,000	1,12,000	2,52,000	4,48,000
3	4,48,000	89,600	3,41,600	3,58,400
4	3,58,400	71,680	4,13,280	2,86,720
5	2,86,720	57,344	4,70,624	2,29,376
5		1,79,376	6,50,000	<u>50,000</u>

November – 2022 (Question no. 5c)

Anika Furniture Ltd., a furniture wholesaler, acquired a new equipment at a cost of Tk. 20,00,000/- at the beginning of the year. The equipment has an estimated economic life of 04 (Four) years and estimated salvage value of Tk. 2,00,000/-. The president of the company has requested for information regarding alternative depreciation method.

You are requested to determine the annual depreciation expenses and schedule for 4 years as under:

- i. Straight Line Method
- ii. Sum of Years Digit Method
- iii. Reducing Balance Method

Solution

Straight Line Method

Formula:

Depreciation = (Cost – Salvage Value) ÷ No. of Years in Useful Life

Given that,

Cost = Tk. 20,00,000/-

Salvage Value = Tk. 2,00,000/-

No. of Years in Useful Life = 4

So, Depreciation per year = Tk. (20,00,000 – 2,00,000) ÷ 4

= Tk. 18,00,000 ÷ 4

= Tk. 4,50,000/-

Solution

Sum of Years Digit Method

Formula:

$$\text{Depreciation} = (\text{Cost} - \text{Salvage Value}) \times (\text{Years in Reverse Order} \div \text{SYD})$$

Where,

$$\text{SYD} = \text{Sum of Years Digit} = n(n+1) \div 2 = 4(4+1) \div 2 = 10$$

Given that,

$$\text{Cost} = \text{Tk. } 20,00,000/-$$

$$\text{Salvage Value} = \text{Tk. } 2,00,000/-$$

$$\text{No. of Years in Useful Life (n)} = 4$$

$$\begin{aligned} \text{So, Depreciation 1}^{\text{st}} \text{ year} &= \text{Tk. } \{(20,00,000 - 2,00,000) * (4 \div 10)\} \\ &= \text{Tk. } (18,00,000 \times 0.4) \\ &= \text{Tk. } 7,20,000/- \end{aligned}$$

Sum of Years Digit Method Contd...

$$\begin{aligned}\text{Depreciation 2}^{\text{nd}} \text{ year} &= \text{Tk. } \{(20,00,000 - 2,00,000) \times (3 \div 10)\} \\ &= \text{Tk. } (18,00,000 \times 0.3) \\ &= \text{Tk. } 5,40,000/-\end{aligned}$$

$$\begin{aligned}\text{Depreciation 3}^{\text{rd}} \text{ year} &= \text{Tk. } \{(20,00,000 - 2,00,000) \times (2 \div 10)\} \\ &= \text{Tk. } (18,00,000 \times 0.2) \\ &= \text{Tk. } 3,60,000/-\end{aligned}$$

$$\begin{aligned}\text{Depreciation 4}^{\text{th}} \text{ year} &= \text{Tk. } \{(20,00,000 - 2,00,000) \times (1 \div 10)\} \\ &= \text{Tk. } (18,00,000 \times 0.1) \\ &= \text{Tk. } 1,80,000/-\end{aligned}$$

Solution

Reducing Balance Method

Year	Depreciation Base (Tk.)	Depreciation per year @ 25% (Tk.)	Accumulated Depreciation/ (Tk.)	Book Value (Tk.)
1	20,00,000	5,00,000	5,00,000	15,00,000
2	15,00,000	3,75,000	8,75,000	11,25,000
3	11,25,000	2,81,250	11,56,250	8,43,750
4	8,43,750	2,10,938	13,67,188	6,32,812
4		4,32,812	18,00,000	<u>2,00,000</u>

October – 2021 (Question no. 4d)

A transport company purchased 03 (Three) buses of which are summarized as under:

Bus	Date of Acquisition	Cost (Tk.)	Useful Life	Salvage Value (Tk.)	Depreciation Method
1	01.01.2015	73,00,000	5 Years	3,00,000	Straight Line
2	01.01.2016	62,00,000	4 Years	2,00,000	Double Declining Balance
3	01.01.2016	70,50,000	5 Years	50,000	Unit of Activity

For bus 3, total kilometers were expected to be 1,20,000. Actual kilometers of use were 24,000 in 2016; 34,000 in 2017; 30,000 in 2018; 20,000 in 2019 and 12,000 in 2020

Requirement: Prepare depreciation schedule for each of the buses.

Solution

Bus-1: Straight Line Method

Formula:

Depreciation = (Cost – Salvage Value) ÷ No. of Years in Useful Life

Given that,

Cost = Tk. 73,00,000/-

Salvage Value = Tk. 3,00,000/-

No. of Years in Useful Life = 5

So, Depreciation per year = Tk. (73,00,000 – 3,00,000) ÷ 5

= Tk. (70,00,000 ÷ 5)

= Tk. 14,00,000/-

Solution

Bus-2: Double Declining Balance Method

Formula:

Depreciation per year = {(Net Book Value) X 2} ÷ No. of Years in Useful Life

Or, Depreciation per year = (2 X SLR) X Net Book Value

Where,

Net Book Value = Cost - Accumulated Depreciation

SLR = Straight Line Rate = 100% ÷ Number of Years (Estimated Life)

Given that,

Cost = Tk. 62,00,000/-

Salvage Value = Tk. 2,00,000/-

No. of Years in Useful Life (n) = 4

So, SLR = 100% ÷ 4 = 25%

Double Declining Balance Method Contd...

$$\begin{aligned}\text{Depreciation for year 2016} &= \text{Tk. } \{(2 \times \text{SLR}) \times \text{Net Book Value}\} \\ &= \text{Tk. } \{(2 \times 25\%) \times (62,00,000-0)\} \\ &= \text{Tk. } 31,00,000/-\end{aligned}$$

$$\begin{aligned}\text{Depreciation for year 2017} &= \text{Tk. } \{(2 \times \text{SLR}) \times \text{Net Book Value}\} \\ &= \text{Tk. } \{(2 \times 25\%) \times (62,00,000-31,00,000)\} \\ &= \text{Tk. } 15,50,000/-\end{aligned}$$

$$\begin{aligned}\text{Depreciation for year 2018} &= \text{Tk. } \{(2 \times \text{SLR}) \times \text{Net Book Value}\} \\ &= \text{Tk. } \{(2 \times 25\%) \times (62,00,000-31,00,000-15,50,000)\} \\ &= \text{Tk. } 7,75,000/-\end{aligned}$$

Double Declining Balance Method Contd...

Depreciation for year 2019

$$= \text{Tk. } \{(2 \times \text{SLR}) \times \text{Net Book Value}\}$$

$$= \text{Tk. } \{(2 \times 25\%) \times (62,00,000 - 31,00,000 - 15,50,000 - 7,75,000)\}$$

$$= \text{Tk. } 3,87,500/-$$

But we know that it has salvage value of Tk.2,00,000.

So, Depreciation For the Year 2019 would be

$$= \text{Tk. } (62,00,000 - 31,00,000 - 15,50,000 - 7,75,000 - 2,00,000)$$

$$= \text{Tk. } 5,75,000/-$$

Solution

Bus-3: Unit of Activity Method

Formula:

$$\text{Depreciation per Unit} = (\text{Cost} - \text{Salvage Value}) \div \text{Estimated Output by Asset}$$

Given that,

$$\text{Cost} = \text{Tk. } 70,50,000/-$$

$$\text{Salvage Value} = \text{Tk. } 50,000/-$$

$$\text{No. of Years in Useful Life} = 5$$

$$\text{Expected kilometers by Bus} = 1,20,000$$

$$\begin{aligned}\text{So, Depreciation per km} &= (\text{Cost} - \text{Salvage Value}) \div \text{Estimated km by Bus} \\ &= \text{Tk. } \{(70,50,000 - 50,000) \div 1,20,000\} \\ &= \text{Tk. } 58.33\end{aligned}$$

Unit of Activity Method Contd...

Year	Depreciation Base	Depreciation per kilometer	Actual kilometer run in the year	Depreciation for the year
2016	70,00,000	58.33	24,000	14,00,000
2017			34,000	19,83,333
2018			30,000	17,50,000
2019			20,000	11,66,667
2020			12,000	7,00,000
Total			1,20,000	70,00,000

Thank You All

Any Question?