CHAPTER – 6

DEPRECIATION AND AMORTISATION

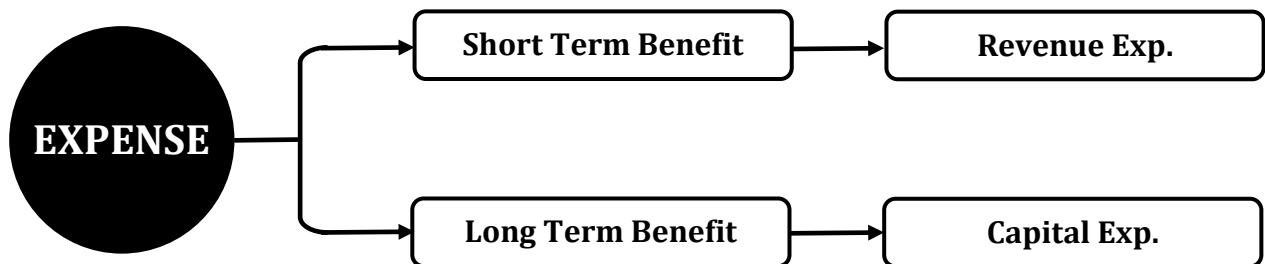## 1. BACKGROUND

1. WHY TO PROVIDE DEPRECIATION – UNDERSTANDING BACKGROUND

'5Ms OF BUSINESS MANAGEMENT OR FACTORS OF PRODUCTION'

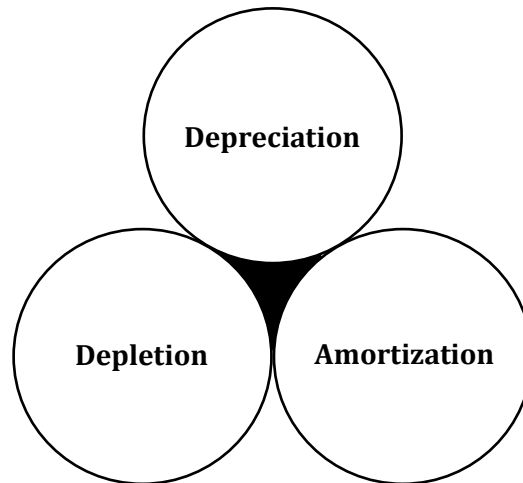5M _____ → _____
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2. WHAT IS AN ASSET

EXPENSE → Short Term Benefit → Revenue Exp.

EXPENSE → Long Term Benefit → Capital Exp.
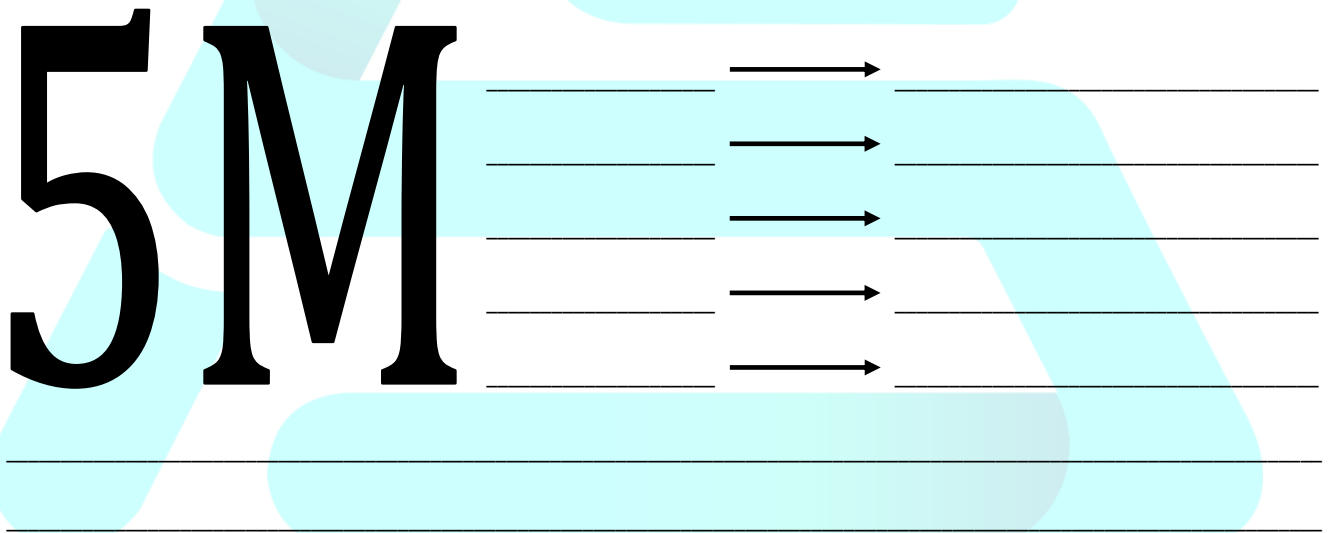
3. **DIFFERENT YET SAME**

'Depreciation' is a diminution or decrease in the value of fixed asset due to -

i. Wear and tear i.e. due to Usage of an asset
ii. Efflux of the time i.e. Passage of time
iii. Obsolescence i.e. change in technology
iv. Accidents
v. Fall in market price, etc.

Depreciation measures cost of expired service potential of the asset. It is a process of allocation and not exact valuation. The American Institute of Certified Public Accountants explained the term 'depreciation' as **"Depreciation accounting is a system of accounting which aims to distribute the cost or other basic value of tangible assets, less salvage (if any) over the estimated useful life of the unit (which may be group of assets) in a systematic and rational manner ".**

According to the Accounting Standard (AS) – 10 'Property, Plant and Equipment' issued by The Institute of Chartered Accountants of India. **"Depreciation is a measure of the wearing out, consumption or other loss of value of a depreciable asset arising from use, efflux of time or obsolescence through technology and market changes".**

Depreciation is allocated so as to charge a fair proportion of the depreciable amount in each accounting period during the expected useful life of the asset. Depreciation includes amortisation of assets whose useful life is predetermined.

AS-10 recognises most commonly applied methods of depreciation viz. **'Straight Line Method'** and **'Reducing Balance Method'.** If depreciated assets are disposed, demolished or destroyed, the profit or loss on such disposal shall be disclosed separately in the Profit and Loss Account.

Normally depreciation is attributable on account of first 'normal were and tear'. Decrease in value is attributable on account of impairment of asset as specified in AS 28.

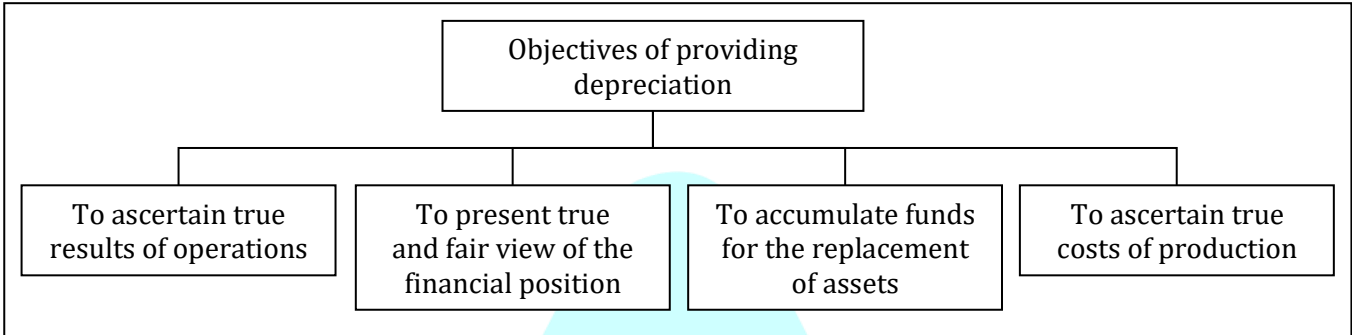According to As 28 **"Impairment of Asset" "Depreciation is systematic allocation of depreciable amount over asset's useful life."**

Depreciable Amount = Cost - Estimate scrap value.

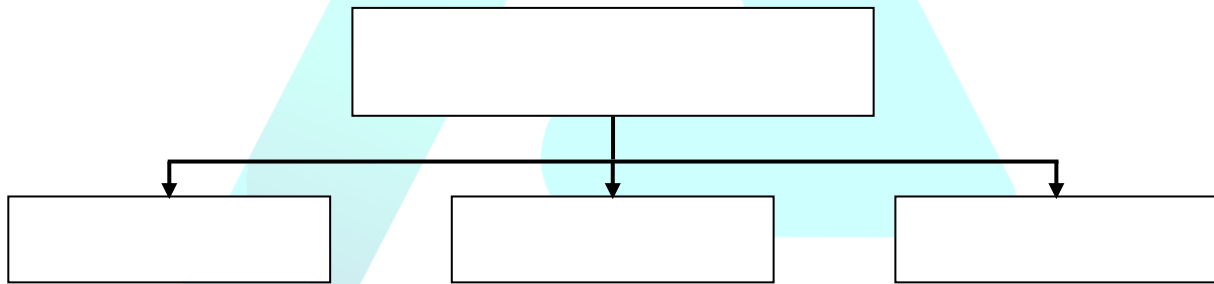**IMPORTANT - Depreciable value of an asset cannot exceed cost of an asset.**

AccDep i.e. Accumulated Depreciation means total depreciation charged on an asset from the date of acquisition/put to use till date.

2. OBJECTIVES FOR PROVIDING DEPRECIATION

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              Objectives of providing
                   depreciation
  ┌──────────────┬──────────────┬──────────────┐
To ascertain true   To present true   To accumulate funds   To ascertain true
results of operations   and fair view of the   for the replacement   costs of production
                        financial position       of assets
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Depreciation is a non-cash expenditure and hence to the extent of depreciation charged to Profit & Loss Account, funds (i.e. cash) are retained in the business. **Non provision of depreciation results in an "Error of Principle".**

3. FACTORS AFFECTING DEPRECIATION

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4. METHODS OF DEPRECIATION

There are many methods available for charging depreciation. An enterprise has to select a method which best defined depreciation pattern of his assets, to show the true and fair view of financial statements. The biggest reason for providing depreciation is **'Matching'** principle of accountancy which states that costs of a period should match revenues of that period. Further **'Consistency'** concept states that once a method of depreciation is selected for an asset, an enterprise must provide depreciation on that asset under same method, atleast for that financial year. They can't change method of depreciation on same asset within same financial year. They can change method on same asset only in subsequent financial year. Thus, an Enterprise may follow different methods of depreciation for different assets; but it cannot follow different methods for the same or similar asset, within the same financial year.

Following are the different methods available for Depreciation and their basis of charge:

No.	METHODS OF DEPRECIATION	BASIS OF CHARGE OF DEPRECIATION
1.	Straight Line Method	Efflux of Time. Actual usage of an asset is not considered.
2.	Written Down Value Method	Efflux of Time. Actual usage of an asset is not considered.
3.	Machine Hour Rate Method	Actual usage of an asset. Efflux of Time is not considered.
4.	Production Units Method	Actual usage of an asset. Efflux of Time is not considered.
5.	Depletion Method	Actual usage of an asset. Efflux of Time is not considered.
6.	Sum of Years of Digits Method	Efflux of Time. Actual usage of an asset is not considered.

"LET'S UNDERSTAND OUR SCOPE"

In every method, we have to understand the following things:
- ✓ Understanding of the terms like – Gross Cost, Net Cost, Accumulated Depreciation, WDV, Depreciable Value, Residual/Scrap Value, etc.
- ✓ How to calculate Rate of Depreciation?
- ✓ How to calculate Amount of Depreciation?
- ✓ Accounting Entries:
  - Accounting for acquisition of an asset
  - Accounting for additional cost/expenses incurred on an asset after acquisition
  - Accounting for annual depreciation
  - Accounting for revaluation of an asset
  - Accounting for Disposal of an asset
    - o Accounting for sales proceeds
    - o Providing depreciation till the date of disposal
    - o Calculation and Accounting for gain/loss on disposal of an asset

In every method that we are going to study henceforth a student is expected to keep in mind aforementioned points and ensure that he gets conversant with the same.

METHOD – 1 STRAIGHT LINE METHOD (SLM) / FIXED INSTALLMENT METHOD (FIM)	
Rate of Depreciation	$\dfrac{Amount\ of\ Depreciation}{Gross\ Cost\ of\ an\ Asset} \times 100$ **or** $\dfrac{100 - Scrap\ Value\ \%}{Life\ of\ an\ Asset(n)}$ ------- **Scrap Value %** = $\dfrac{Amount\ of\ Scrap\ Value}{Gross\ Cost\ of\ an\ Asset} \times 100$
Amount of Depreciation	$\dfrac{Cost\ -\ Estimated\ scrap\ Value}{Estimated\ life\ (No.\ of\ years)}$ **or** *Gross Cost (C) x Rate of Depreciation*

Example 1:

Cost of Machinery Rs. 6,00,000/-

Estimated useful life - 4 years.

Estimated scrap value at the end of useful life - Rs. 60,000/-

Solution:

Annual Depreciation $= \dfrac{Cost\ -\ Estimated\ scrap\ Value}{Estimated\ life\ (No.\ of\ years)}$

$= \dfrac{6,00,000 - 60,000}{4}$

= Rs. 1,35,000

(In the aforementioned example, since 'C', 'n' and 'r' is available, we can directly calculate amount of depreciation and we don't need to calculate Rate of depreciation. But, if we are supposed to calculate rate of depreciation, we can calculate using either of the formula as under).

Rate of Depreciation $= \dfrac{Amount\ of\ Depreciation}{Gross\ Cost\ of\ an\ Asset} \times 100$ | $\dfrac{100 - Scrap\ Value\ \%}{Life\ of\ an\ Asset(n)}$

$= \dfrac{1,35,000}{6,00,000} \times 100$ | $= 100 - \dfrac{\left[\dfrac{60,000}{6,00,000} \times 100\right]}{4}$

= 22.50% | $= \dfrac{100 - 10}{4} = 22.50\%$

(Now, once we have calculated rate of depreciation, we can calculate amount of depreciation with second formula as under).

Annual Depreciation = 22.5% of Rs. 6,00,000/-

= Rs. 1,35,000/-

UNDERSTANDING TERMS			
Gross Cost of an asset	Rs. 6,00,000	**Acc. Dep (2nd Year)**	Rs. 1,35,000 x 2 = Rs. 2,70,000
Net Cost / Depreciable Value	Rs. 6,00,000 – Rs. 60,000 = Rs. 5,40,000	**Acc. Dep (4th Year)**	Rs. 1,35,000 x 4 = Rs. 5,40,000

Now, if annual depreciation is plotted on graph, then we will get it as under –
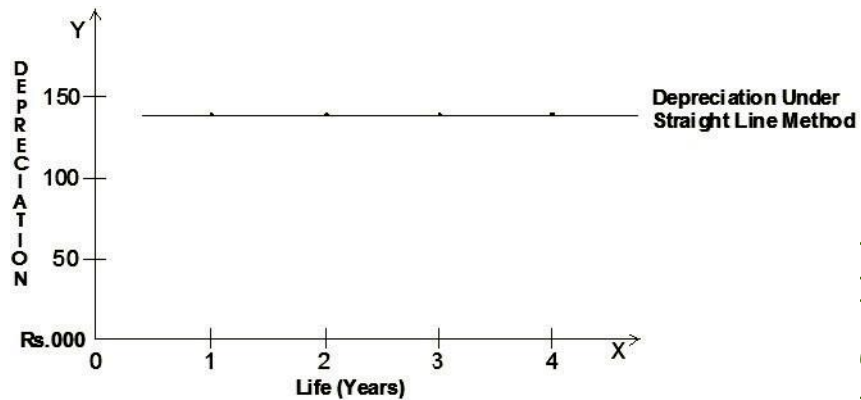
Salient Features of SLM:

1. Simple to understand, easy to operate.

2. Wide usage or popular method of depreciation.

3. Depreciation remains constant year after year.

4. Prescribed method under the Companies Act, 2013.

5. Book value of at the end of useful life of an asset can be NIL i.e. Zero.

6. Depreciation is provided on time basis i.e. on additions from the date of effective usage (i.e. Date of Put to Use) and on disposal up to the date of sale.

7. Depreciation is not linked with reference to actual usage. In other words, irrespective of variation of usage, depreciation remains constant year after year.

8. This method is more appropriate, when use of an asset is expected to remain constant year after year.

9. **When the life of the asset decreases, repairs and maintenance expense increases, considering the charge of depreciation as well as repairs & maintenance together, total charge to profit & loss A/c. is expected to increase year after year.**

    (Explained graphically at the last part of this topic).

METHOD – 2 REDUCING BALANCE METHOD (RBM) / WRITTEN DOWN VALUE METHOD (WDV)	
Rate of Depreciation	$1 - \sqrt[n]{\dfrac{r}{C}} \times 100$ ---------- **'n'** = life, **'C'** = Gross Cost and **'r'** = Residual Value **or** $\dfrac{Amount\ of\ Depreciation}{Gross\ Cost\ of\ an\ Asset} \times 100$
Amount of Depreciation	Gross Cost of an Asset (For First Year) **OR** WDV of an Asset (For Subsequent Years) $\Big\} \times Rate\ of\ Depreciation$

Example 2:

Cost of Machinery Rs. 6,00,000/-

Estimated useful life - 4 years.

Estimated scrap value at the end of useful life Rs. 60,000/-

Solution:

$$\text{Rate of Depreciation} = 1 - \sqrt[4]{\frac{60,000}{6,00,000}}$$

$$= 1 - \sqrt[4]{0.10}$$

$$= 1 - 0.562341$$

$$= 0.437659 \quad \text{i.e. } 43.7659\%$$

Summary of Depreciation

Years	WDV at the Beginning (Rs.)	Depreciation @ 43.7659% (Rs.)	WDV at the End (Rs.)
1.	(GROSS COST) 6,00,000	2,62,595	3,37,405
2.	3,37,405	1,47,668	1,89,737
3.	1,89,737	83,040	1,06,697
4.	1,06,697	46,697	60,000
	TOTAL	5,40,000	

Now, if annual depreciation is plotted on graph, then we will get it as under –
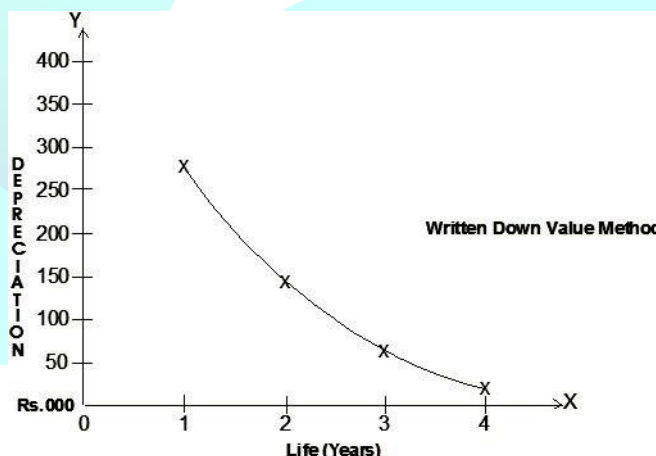
Salient Features:

1. Charge of Depreciation reduces year after year.
2. Simple to understand but complicated to calculate Rate of Depreciation with mathematical formula.
3. Rate of Depreciation remains constant throughout.
4. Wide usage and commonly used method of depreciation.
5. The method has been prescribed under the Income Tax Act, 1961 as well as under the companies Act, 2013.
6. Written down value is never nil (zero).
7. When the estimated scrap value is zero or there is a nominal scrap value, calculated rate of depreciation is absurd (i.e. illogical).
8. **When the life of the asset decreases, repairs and maintenance increases. Thus decrease in depreciation is compensated by increase in repairs and maintenance cost, thereby total charge to profit & loss account is expected to remain constant year after year.** (Explained graphically at the last part of this topic).

UNDERSTANDING TERMS			
Gross Cost of an asset	Rs. 6,00,000	**AccDep (2nd Year)**	Rs.2,62,595 + Rs.1,47,668 = Rs. 4,10,263
Net Cost / Depreciable Value	Rs. 6,00,000 – Rs. 60,000 = Rs. 5,40,000	**WDV (2nd Year) = Cost-AccDep**	Rs. 6,00,000 – Rs. 4,10,263 = Rs. 1,89,737

Example 3:

Cost of an asset = 5,00,000

Estimated life = 4 years.

Estimated scrap value at the end of economic life = 0

Solution:

Rate of Depreciation $= 1 - \sqrt[n]{\dfrac{r}{C}} = 1 - \sqrt[4]{\dfrac{0}{5,00,000}} \times 100 \qquad = 1 - \sqrt[4]{0} \qquad = 1 - 0 = 1.$ i.e. 100%.

Though the life of the asset is 4 years, entire depreciation is written off in the first year itself. As such, method yields absurd rate of depreciation.

In this case one may take nominal value as scrap value and calculate the rate of depreciation. Scrap value for depreciation calculation taken as Rs. 1,000.

Rate of Depreciation $= 1 - \sqrt[4]{\dfrac{1,000}{5,00,000}} \times 100 = 1 - \sqrt[4]{\dfrac{1}{500}} \times 100 = (1 - 0.21147425266) \times 100$

$= 0.78853$ i.e. 78.853%.

Even this calculated rate is illogical, as a major amount of cost is written off in the first few years.

Example 4:

From the following data, find out the depreciation under written down value method:

Cost = Rs. 5,00,000.

Estimated life = 5 years.

Estimated scrap value at the end of useful life = Rs. 50,000

Rate of Depreciation $= \left(1 - \sqrt[n]{\dfrac{r}{C}}\right) = 1 - \sqrt[5]{\dfrac{50,000}{5,00,000}} = 1 - \sqrt[5]{\dfrac{1}{10}} = 1 - 0.63102265454.$

$= 0.36897734546.$ i.e. 36.897%

Statement of Depreciation handing of the table.

Year	WDV at the Beginning (Rs.)	Depreciation (Rs.)	WDV at the End (Rs.)
1.	5,00,000	1,84,489	3,15,511
2.	3,15,511	1,16,417	1,99,094
3.	1,99,094	73,461	1,25,633
4.	1,25,633	46,356	79,277
5.	79,277	29,251	*50,026
	TOTAL	**4,49,974**	

* Rs. 26 difference due to rounding off

How to calculate odd root $\left(\sqrt{}\right)$ [i.e. 3, 5, 7 ....) of 0.10 of the above example?

In professional examination calculator with basic functions is allowed. Scientific calculator is not allowed.

The following steps gives nearby answer (not fully accurate answer)

Step 1 : Take figure under calculation i.e. 0.10.

Step 2 : Press root button $(\sqrt{\ })$ 12 times to step 1 answer.

= 0.9994380034

Step 3 : Subtract 1 from step 2 answer.

= -0.0005619966.

Step 4 : Step 3 answer divided by root $(\sqrt{\ })$.

= $\dfrac{-0.0005619966}{5}$ = - 0.00011239932

Step 5 : Add 1 to step 4 answer

= 0.99988760068

Step 6 : With step 5, Press x and = buttons 12 times (press x = is one time)

0.99988760068 x and = 12 times.

= 0.63102265454.

Note: The above referred steps doesn't give accurate but approximately answer is correct.

Distinguish between Straight Line Method & Written Down Value method.

No.	Straight Line Method	Written Down Value Method.
1.	Depreciation remains constant year after year	Depreciation decreases year after year.
2.	Rate of Depreciation $$= 100 - \dfrac{\text{Estimated Scrap value percentage cost}}{\text{Estimated life}}$$	$$= 1 - \sqrt[n]{\dfrac{r}{C}}$$
3.	Annual depreciation = Rate of Depreciation x cost	= Rate of Depreciation x WDV
4.	Book Value Book Value may results to 0	Book value never results to 0
5.	Prescribed under the companies Act, 2013	Prescribed under the Companies Act, 2013 and Income Tax Act, 1961.
6.	In initial years, depreciation is lesser as compared to WDV Method and in later years, there is more depreciation as compared to WDV Method.	In initial years depreciation is higher as compared to SL Method and in later years, depreciation is lesser as compared to SL Method.
7.	Depreciation + Repairs and Maintenance charges debit to profit and loss account increases year after year.	Decrease in depreciation is expected to compensate by way of increasing repairs maintenance, thereby total charge to profit and loss account will approximately remain the same.
8.	Rate as well as amount of depreciation remains constant.	Rate remains constant, but amount of depreciation decreases year after year.

METHOD – 3 MACHINE HOUR RATE METHOD	
Rate of Depreciation (Per Machine Hour)	$\dfrac{Cost - Estimated\ scrap\ value}{Estimated\ Machine\ hours\ over\ asset's\ useful\ life}$
Amount of Depreciation	$\dfrac{Cost - Estimated\ scrap\ value}{Estimated\ Machine\ hours\ over\ asset's\ useful\ life} \times Actual\ Machine\ Hrs.$

METHOD – 4 PRODUCTION UNIT METHOD	
Rate of Depreciation (Per Machine Hour)	$\dfrac{Cost - Estimated\ scrap\ value}{Estimated\ Total\ Pr\ oduction}$
Amount of Depreciation	$\dfrac{Cost - Estimated\ scrap\ value}{Estimated\ Total\ Pr\ oduction} \times Actual\ Production\ during\ the\ year$

METHOD – 5 DEPLETION METHOD	
Rate of Depreciation (Per Machine Hour)	$\dfrac{Cost - Estimated\ scrap\ value}{Estimated\ output*\ over\ asset's\ useful\ life}$
Amount of Depreciation	$\dfrac{Cost - Estimated\ scrap\ value}{Estimated\ output*\ over\ asset's\ useful\ life} \times Actual\ Extraction\ /\ Output$

(Under any of these methods there is no use of calculating % depreciation as depreciation is charged on actual usage. Therefore we calculate Rate of Depreciation per Machine Hour/Per Unit/Qty. Output).

The aforementioned three methods are identical methods, where depreciation is not charged on the basis of period but it is more appropriately charged on the basis of actual usage of an asset. These methods are applicable for those assets whose physical life and legal life may be than its' economic life is less, due to usage. More appropriately these assets do not significantly gets depreciated if they aren't used and they get significantly depreciated when radically used.

Machine Hour Rate method is used for those machines that comes with rated capacity of efficient hours of operation, i.e. the machine either becomes inoperative or inefficiently operative after its rated capacity is over. For E.g. Industrial batteries: Heavy industrial batteries are alternative source of power supply used for specific purposes. The life of such batteries depends on 'No. of recharging cycles'.

Production Unit method is used for those assets that comes with defined capacity of output, i.e. they cannot produce more than its defined capacity. For E.g. Toner/Ink of a printer: Every refill has some predetermined number of printouts. More prints taken, more is ink consumption and vice versa.

Depletion method is mostly used for depleting assets, which are scarce in volume and it's quantity decreases with extraction. For E.g. – Wasting assets like Coal Mines, Oil wells, etc.

These methods are highly dependent on estimation as the numerator comprises of 'Estimated Hours/Output'. These estimated are based on the facts and findings, but with an underlying assumption of subjectivity. Therefore, actual certainly varies from estimate. While computing depreciation, it is equally important to consider such deviation in estimated and actual (machine hours or output) as under –

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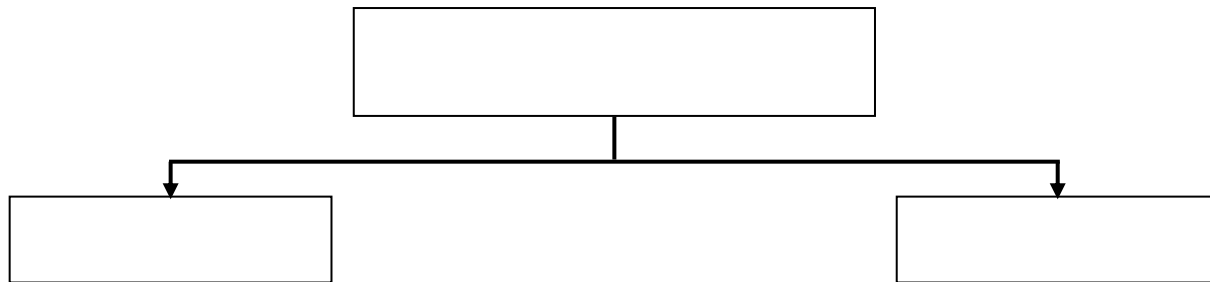
Example 5:

X & Co. purchased a machinery for Rs. 8,00,000. Estimated life of the machine is 5 years at the end of which it is expected to realise scrap value of Rs. 20,000. Machinery is expected to be used for 8 hours a day, 5 days a week, and 50 weeks in a financial year with 80% efficiency.

Actual hours for which the machine is operated is as under:

Year	Hours
1.	1350
2.	1550
3.	1650
4.	1600
5.	1750

Solution:

$$\text{Annual depreciation} = \frac{\text{Cost} - \text{Estimated scrap value}}{\text{Estimated Machine hours over asset's useful life}} \times \frac{\text{Actual Machine hours}}{\text{during the financial year}}$$

Estimated machine hours over asset's useful life = 5 years x 50 weeks x 5 days x 8 Hrs. x 80%

= 8000 Hrs.

Statement showing Depreciation

Year	Calculation	Depreciation (Rs.)
1.	$\frac{1,350}{8,000}$ x [8,00,000 - 20,000]	1,31,625
2.	$\frac{1,550}{8,000}$ x [8,00,000 - 20,000]	1,51,125

Year	Calculation	Depreciation (Rs.)
3.	$\frac{1,650}{8,000}$ x [8,00,000 - 20,000]	1,60,875
4.	$\frac{1,600}{8,000}$ x [8,00,000 - 20,000]	1,56,000
5.	$\frac{1,750}{8,000}$ x [8,00,000 - 20,000]	1,70,625
	Total	**7,70,250**

Balance in Machinery A/c at the end of 5th year after considering scrap value realised is required to be transferred to Profit & Loss Account.

Salient Features:

1. Amount of depreciation fluctuates from year to year.
2. Depreciation base is with reference to estimated machine hours and calculation is with reference to actual usage of machine hours. In other words, depreciation is provided with reference to actual usage. This is an appropriate method.

Graphical Presentation:
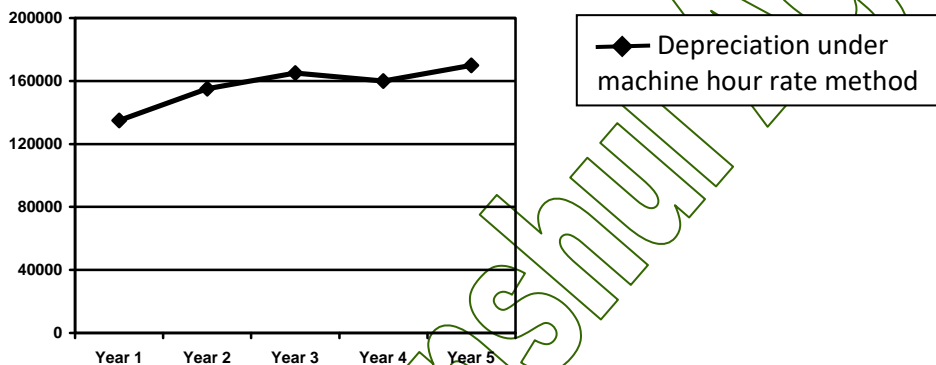
Example 6:

X & Co. purchased a machinery for Rs. 8,00,000. Estimated life of the machine is 5 years at the end of which it is expected to realise scrap value of Rs. 20,000. Machinery is expected to be used for 8 hours a day, 5 days a week, and 50 weeks in a financial year with 80% efficiency

Actual Machine hours are:

Year	Hours
1.	1350
2.	1550
3.	1650
4.	1700
5.	1850

Solution:

$$\text{Annual depreciation} = \frac{\text{Cost} - \text{Estimated scrap value}}{\text{Estimated Machine hours over asset's useful life}} \times \frac{\text{Actual Machine hours}}{\text{during the financial year}}$$

Estimated machine hours over asset's useful life = 5 years x 50 weeks x 5 days x 8 Hrs x 80%

= 8000 Hrs.

Statement showing Depreciation

Year	Calculation	Depreciation (Rs.)

Year	Calculation	Depreciation (Rs.)
1.	$\frac{1,350}{8,000}$ x [8,00,000 - 20,000]	1,31,625
2.	$\frac{1,550}{8,000}$ x [8,00,000 - 20,000]	1,51,125
3.	$\frac{1,650}{8,000}$ x [8,00,000 - 20,000]	1,60,875
4.	$\frac{1,700}{8,000}$ x [8,00,000 - 20,000]	1,65,750
5.	$\frac{1,850}{8,000}$ x [8,00,000 - 20,000] i.e. Rs. 1,80,375	6,09,375
	or balance undepreciated amount Rs. 1,70,625, whichever is lower	1,70,625
	Total	**7,80,000**

Note: Total Depreciation need not exceed depreciable amount. [i.e. 8,00,000 - 20,000]

Similar to machine hour method, one may provide depreciation on mileage method on vehicles

Annual Depreciation = $\frac{\text{Cost} - \text{Estimated scrap value}}{\text{Estimated mileage overe economic life}} \times$ Actual Machine during the financial year

Example 7:

A machine is purchased for Rs. 2,00,000 with an estimated useful life of 10 years and residual value of Rs. 20,000. The machine is expected to produce 1.5 Lakh units during its lifetime. Expected distribution pattern of production is as follows:

Year	Annual Production (Units)
1 – 3	20,000
4 – 7	15,000
8 – 10	10,000

Determine the value of depreciation for each year using Production Units Method.

Solution:

Statement showing Depreciation:

Year	Calculation	Depreciation
1-3	(2,00,000-20,000) x $\frac{20,000}{1,50,000}$	24,000
4-7	(2,00,000-20,000) x $\frac{15,000}{1,50,000}$	18,000
8-10	(2,00,000-20,000) x $\frac{10,000}{1,50,000}$	12,000

Example 8:

A mine is taken on lease for a period of 5 years by paying lump sum amount of Rs. 25,00,000/- During the lease period, the expected output is 2,00,000 kgs.

Actual output during the period is as follows:

Year	Output (kgs)
1.	34,000
2.	36,000
3.	43,000
4.	37,000
5.	45,000

Show the amount of depreciation under Depletion Method

Solution:

Statement showing Depreciation:

Year	Calculation	Depreciation
1.	$25,00,000 \times \dfrac{34,000}{2,00,000}$	4,25,000
2.	$25,00,000 \times \dfrac{36,000}{2,00,000}$	4,50,000
3.	$25,00,000 \times \dfrac{43,000}{2,00,000}$	5,37,500
4.	$25,00,000 \times \dfrac{37,000}{2,00,000}$	4,62,500
5.	$25,00,000 \times \dfrac{45,000}{2,00,000}$	5,62,500
	Total	**24,37,500**

Balance in Lease A/c at the end of 5th year amounting to Rs. 62,500 is required to be transferred to profit & loss A/c. This is on account of lesser output than as estimated.

Graphical Presentation: Depletion Method
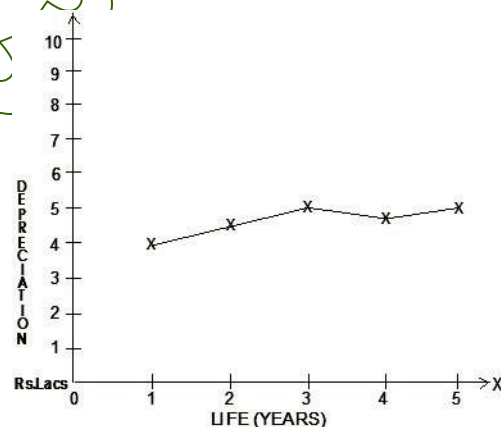
Example 9:

A mine is taken on lease for a period of 5 years by paying lump sum amount of Rs. 25,00,000/- During the lease period, the expected output is 2,00,000 kgs.

Actual output during the period is as follows:

Year	Output (kgs)
1.	34,000
2.	36,000
3.	59,000
4.	43,000
5.	46,000

Find out the depreciation under Depletion Method.

Solution:

$$\text{Annual Depreciation} = \frac{\text{Cost} - \text{Estimated scrap value}}{\text{Estimated output* over asset's useful life}} \times \left[\begin{array}{c} \text{Actual output*} \\ \text{during the financial year} \end{array}\right]$$

*Alternatively, may be called as Raisings or Extractions.

Year	Calculation	Depreciation (Rs.)
1.	$\frac{25,00,000}{2,00,000} \times 34,000$	4,25,000
2.	$\frac{25,00,000}{2,00,000} \times 36,000$	4,50,000
3.	$\frac{25,00,000}{2,00,000} \times 59,000$	7,37,500
4.	$\frac{25,00,000}{2,00,000} \times 43,000$	5,37,500
	Sub – total	**21,50,000**
5.	$\frac{25,00,000}{2,00,000} \times 46,000 = \text{Rs. } 5,75,000$ **Or** balance undepreciated amount Rs. 3,50,000, whichever is lower	3,50,000
	Total	**25,00,000**

Note: Total Depreciation not to exceed depreciable amount.

Salient Features:

1. Amount of depreciation fluctuates from year to year.
2. Depreciation base is with reference to estimated output and calculation is with reference to actual output. In other words, the depreciation is provided with reference to actual benefit derived i.e. output. This is an appropriate method.
3. The method is used for providing depreciation on wasting assets viz. quarry, mine, oil well etc.

METHOD – 6 SUM OF THE YEARS OF DIGITS METHOD	
Rate of Depreciation (Per Machine Hour)	$\left(\dfrac{Cost - EstimatedRV}{Sum\ of\ the\ Digits}\right)$ ---------Sum of the Digits = $n\left(\dfrac{n+1}{2}\right)$
Amount of Depreciation	[Cost - Estimated residue value] x $\left(\dfrac{Re\ maining\ Useful\ Life\ of\ asset}{Sum\ of\ the\ Digits}\right)$

Example 10:

From the following information calculate depreciation under Sum of the Digits Method.

Cost = Rs. 2,50,000/-

Estimated life = 5 years.

Estimated scrap value = Rs. 25,000/-

Sum of digits = $5\left(\dfrac{5+1}{2}\right)$ = 15

Annual Depreciation = $\dfrac{\left(Remaining\ life\ (including\ current\ year)\right)}{Sum\ of\ digits} \times \left[\cos t\text{-}Estimated\ scrap\ value\right]$

Statement of Depreciation

Year	Calculation	Depreciation (Rs.)
1.	5/15 x [2,50,000 - 25,000]	75,000
2.	4/15 x [2,50,000 - 25,000]	60,000
3.	3/15 x [2,50,000 - 25,000]	45,000
4.	2/15 x [2,50,000 - 25,000]	30,000
5.	1/15 x [2,50,000 - 25,000]	15,000
	Total	**2,25,000**

Graphical Presentation:
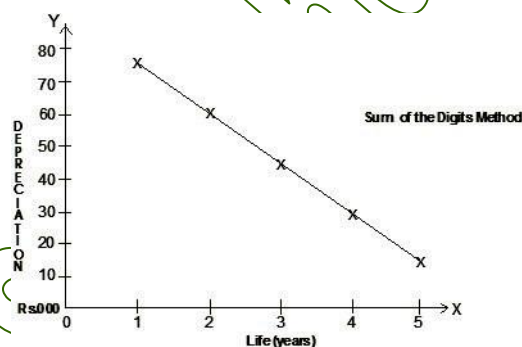
Salient Features:

1. Simple to understand, easy to operate.
2. Uncommon method of depreciation. Method of depreciation is rarely followed
3. Amount of depreciation decreases year after year.
4. The method resembles to Written Down Value Method.
5. The method is not prescribed by any law.
6. Depreciation rate cannot be calculated.

Example 11:

From the following information calculate the depreciation under Sum of the Digits Method:-

Sr. No.	Cost (Rs.)	Estimated RV (Rs.)	Life (years)	Sum of the Digits	Depreciation for	Amount Of Depreciation
1.	1,60,000	5% of cost	10		2nd Year	
					6th Year	
					9th Year	
2.	4,90,000	10,000	8		3rd Year	
					5th Year	
					8th Year	
3.	6,50,000	2% of cost	20		1st Year	
					14th Year	
					16th Year	
4.	9,00,000	4% of cost	15		4th Year	
					7th Year	
					11th Year	

5. ACCOUNTING ENTRIES UNDER VARIOUS METHODS

1. Straight line method
2. Written Down Value Method
3. Machine Hour Rate Method
4. Production Units Method
5. Depletion Method
6. Sum of the Years Digits Method

No.	Transaction	Accounting Entry
1.	Purchase of an Asset	Asset A/c .... Dr. To cash/ Bank/ Vendor's A/c.
2.	Payment to vendor	Vendor's A/c .... Dr. To Bank A/c.
3.	Depreciation	Depreciation A/c. .... Dr. To Asset A/c.
4.	Sale of an Asset i) Depreciation up to the date of sale: ii) Sale value: iii) Profit / Loss on sale of asset: a) Profit = Sale Value - Book Value (BV) B.V. = cost - Accumulated dep. B.V. = W.D.V. b) Loss = Book Value - Sale Value.	Depreciation A/c .... Dr. To Asset A/c. Cash / Bank A/c .... Dr. To Asset A/c. Asset A/c .... Dr. To profit on sale of Asset A/c. Loss on sale of Asset A/c. .... Dr. To Asset A/c.
5.	Exchange of an Asset	

No.	Transaction	Accounting Entry
	i) Cost of new Asset:	Asset A/c. .... Dr. To Vendor's A/c.
	ii) Exchange value of old asset:	Vendor's A/c .... Dr. To Asset A/c.
	iii) Settlement of Vendor's A/c:	Vendor's A/c .... Dr. To Bank A/c.

	iv) Profit / Loss on Exchange i.e. sale:
	    a) profit = Sale Value - Book Value (BV)
	        B.V. = cost - Accumulated dep.
	        B.V. = W.D.V.
	    b) Loss = Book Value - Sale Value.
		Asset A/c .... Dr.
		    To profit on sale of Asset A/c.
		
		Loss on sale of Asset A/c. .... Dr.
		    To Asset A/c.

6.	Transfer of Nominal Account Balances
	i) Debit Balances:
	
	ii) Credit Balances:
		Profit & Loss A/c .... Dr.
		    To Depreciation A/c
		    To Loss on sale of Asset A/c
		
		Profit on sale of Asset A/c .... Dr.
		    To Profit & Loss A/c.

6. ACCOUNTING ENTRIES WHEN DEPRECIATION IS CREDITED TO 'PROVISION FOR DEPRECIATION ACCOUNT'

Ordinarily, depreciation is credited to Asset A/c. Under Companies Act 2013, companies are required to show Asset Account at cost and Provision for Depreciation (Accumulated Depreciation) separately. Hence depreciation may be alternatively credited to 'Provision for Depreciation A/c'. In this case following are the relevant ledger accounts -

1. Asset Account (at cost)
2. Provision for Depreciation Account (accumulated depreciation).
3. Asset Disposal Account (Sale of Asset).

Accounting entries

No.	Transactions	
1.	Purchase of an Asset -	Asset A/c. .... Dr. To Cash / Bank A/c.
2.	Depreciation -	Depreciation A/c. .... Dr. To Provision for Depreciation A/c.

3.	Sale of an Asset -
	i) Depreciation up to the date of sale:
	
	ii) Transfer of cost
	
	iii) Transfer of Accumulated Depreciation
	[including depreciation provided up to the date of sale]
	iv) Sale value:
		Depreciation A/c. .... Dr.
		    To Provision for Depreciation A/c.
		Asset Disposal A/c. .... Dr.
		    To Asset A/c.
		Provision for Depreciation A/c. .... Dr.
		    To Asset Disposal A/c.
		
		Bank A/c. .... Dr.

No.	Transactions	
		To Asset Disposal A/c.
	v) Profit / Loss on sale:	
	a) Profit	Asset Disposal A/c. .... Dr.
		To Profit on sale of Asset A/c.
	b) Loss	Loss on sale of Asset A/c. .... Dr.
		To Asset Disposal A/c.
4.	Transfer of Nominal Account Balances –	
	i) Debit Balances:	Profit & Loss A/c. .... Dr.
		To Depreciation A/c.
		To Loss on Sale of Asset A/c.
	ii) Credit Balance:	Profit on Sale of Asset A/c. .... Dr.
		To profit & Loss A/c.

7. CHANGE OF DEPRECIATION

We have already seen factors affecting depreciation i.e. Cost of an asset, estimated Useful Life of an asset and estimated Scrap Value or Residual Value of an asset. Now, if any of these factors subsequently changes, it results into change in amount of depreciation.

CHANGE IN ESTIMATED USEFUL LIFE OF AN ASSET:

Example 20:

Lakshya Ltd. purchased plant for Rs. 6,00,000. The useful life has been estimated as 4 years. The estimated scrap value was Rs. 60,000. After providing depreciation for 2 years under SLM method, the total life of plant has been re-estimated to 6 years (including past 2 years). Find out the depreciation to be provided over useful life of an asset.

CHANGE IN ESTIMATED SCRAP VALUE OF AN ASSET:

Example 21:

Lakshya Ltd. purchased plant for Rs. 6,00,000. The useful life has been estimated as 4 years. The estimated scrap value was Rs. 60,000. After providing depreciation for 2 years under SLM method, the residual value of an asset is reassessed as Rs. 80,000. Find out the depreciation to be provided over useful life of an asset.

CHANGE IN COST OF AN SSET:

Example 22:

Lakshya Ltd. purchased a machinery for Rs. 4,50,000. The life has been estimated as 8 years at the end of which it is expected to yield scrap value @ 3% of cost. Depreciation is provided under Straight Line Method. After providing depreciation for 3 years, a new machine is attached to the earlier purchased Machinery for better quality of output at a cost of Rs. 40,000. There is no change in estimated scrap value. Find out Depreciation over asset's useful life.

8. SUBSEQUENT REVALUATION OF AN ASSET
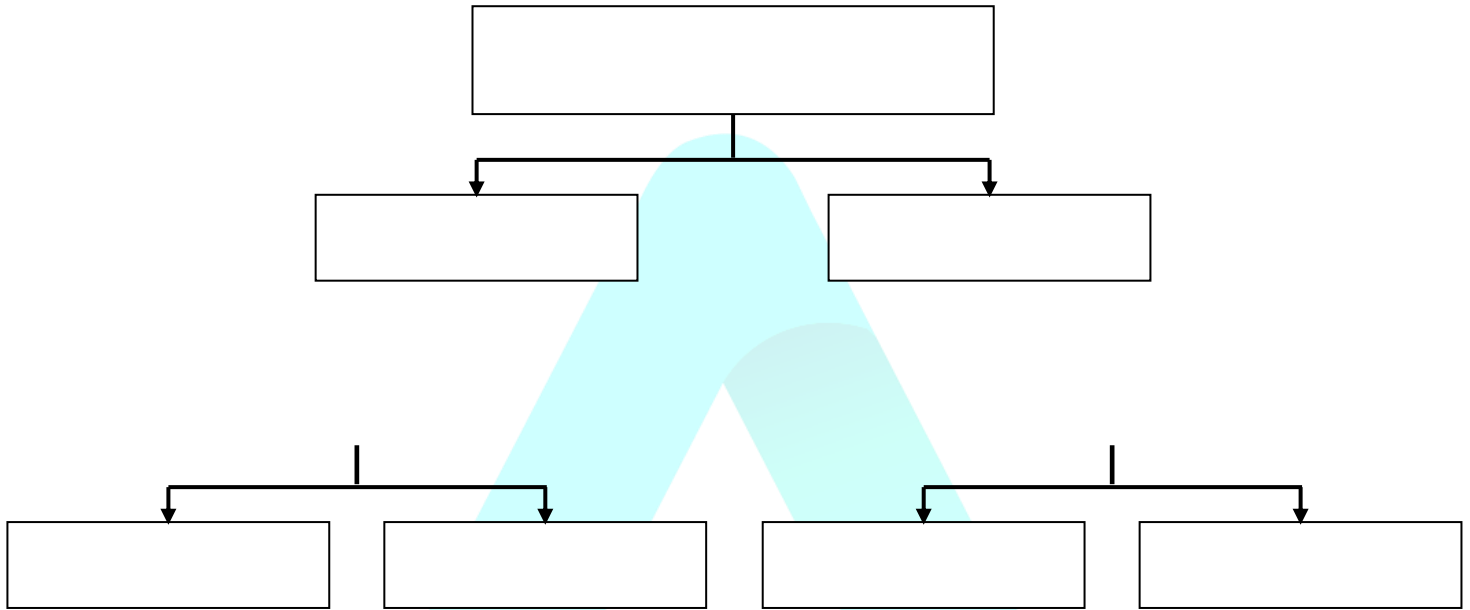
Example 23:

Lakshya Ltd. purchased a Machinery for Rs. 5,00,000 with an estimated life of 6 years. Depreciation is provided under Straight Line Method. The scrap value has been estimated to zero. After providing depreciation for 2 years, there is an upward valuation by Rs. 1,00,000. Find out amount of Depreciation over useful life of an asset. Also pass Journal Entries in the books of the company.

9. DEPRECIATION + REPAIRS = TOTAL CHARGE TO P & L ACCOUNT

An asset when newly bought tends to incur very less repairing expenses but as and when the asset is used, repairing expenses incurred thereon increases. Such repairing expenses exerts burden on overall profitability of the company. Further, depreciation provided on assets exerts more pressure on organisations profitability.

Therefore,

Total Repairing Expenses + Total Depreciation = Total Charge to Profit and Loss Account

Resulting into, decrease in profitability.

Therefore, if such a method of depreciation is adopted wherein the amount is either higher in initial years or the amount of depreciation is constant like SLM, Sum of the years of Digits Method, Annuity Method and Sinking Fund Method, then overall charge to Profit and Loss account will be higher but if such a method of depreciation is used like WDV where depreciation in initial years is more and subsequent years is less then overall charge on profitability will be balanced.

10. AMORTISATION ON INTANGIBLE ASSETS

The concept of amortisation in case of intangible assets is similar to the concept of depreciation in case of tangible assets. In other words, 'depreciation of an intangible asset' is called AMORTISATION. Amortisation can be defined as 'the systematic allocation of the depreciable amount of an intangible asset over its useful life'. Depreciable amount is the cost of an asset less its residual value.

Useful life is either:
(a) the period of time over which an asset is expected to be used by the enterprise; or
(b) the number of production or similar units expected to be obtained from the asset by the enterprise.

Residual value is the amount which an enterprise expects to obtain for an asset at the end of its useful life after deducting the expected costs of disposal. The depreciable amount of an intangible asset should be allocated on a systematic basis over the best estimate of its useful life. Amortisation should commence when the asset is available for use. It is presumed that the useful life of an intangible asset will not exceed ten years from the date when the asset is available for use unless evidence exists to the contrary. For instance, given the rapid changes in technology, computer software and many other intangible assets are susceptible to technological obsolescence. Therefore, it is likely that their useful life will be short. Similarly, intangible assets with contractual rights for a period exceeding ten years, will be amortised over such extended period rather than the presumed period of ten years.

Similar to depreciation, the amortisation method used should reflect the pattern in which the asset's economic benefits are consumed by the enterprise. If that pattern cannot be determined reliably, the straight-line method should be used. The amortisation charge for each period should be recognised as an expense unless permitted or required to be included in the carrying amount of another asset.

Given the nature of intangible assets, the residual value of an intangible asset should be assumed to be zero unless:
(a) there is a commitment by a third party to purchase the asset at the end of its useful life; or
(b) there is an active market for the asset and:
    (i) residual value can be determined by reference to that market; and
    (ii) it is probable that such a market will exist at the end of the asset's useful life.

The amortisation period and the amortisation method should be reviewed at least at each financial year end. If the expected useful life of the asset is significantly different from previous estimates, the amortisation period should be changed accordingly. If there has been a significant change in the expected pattern of economic benefits from the asset, the amortisation method should be changed to reflect the changed pattern.

11. PRACTICAL PROBLEMS

Q1. SLM Basic Question ICAM SM Illu.1   **REG. PAGE NO.**

Jain Bros. acquired a machine on 1st July, 2021 at a cost of Rs. 14,00,000 and spent Rs. 1,00,000 on its installation. The firm writes off depreciation at 10% p.a. of the original cost every year. The books are closed on 31st December every year. Required: Show the Machinery Account and Depreciation Account for the year 2021 and 2022.

Q2. SLM Basic Question ICAM SM Q3   **REG. PAGE NO.**

The LG Transport company purchased 10 trucks at Rs. 45,00,000 each on 1st April 2019. On October 1st, 2021, one of the trucks is involved in an accident and is completely destroyed and Rs. 27,00,000 is received from the insurance in full settlement. On the same date another truck is purchased by the company for the sum of Rs. 50,00,000. The company write off 20% on the original cost per annum. The company observe the calendar year as its financial year. Give the motor truck account for two year ending 31 Dec, 2022.

Q3.   SLM Basic Question   **REG. PAGE NO.**

On 1st July 2015 Lakshya Ltd., purchased second hand machinery for Rs. 20,000 and spends Rs. 3,000 on reconditioning and installing it. On 1st January 2016 the firm purchases new machinery worth Rs. 12,000. On 30th June, 2017 the machinery purchased on 1st January, 2016 was sold for Rs. 8,000 and on 1st July, 2017 new plant was installed.

Payment for this plant was to be made as follows:-

1st July, 2017   Rs. 5,000

30th June, 2018   Rs. 6,000

The company writes off 10 % p.a. on the original cost. The accounts are closed every year on 31st March. Show the Machinery Account for the year ending 31st March, 2018.

Q4.   WDV Basic Question ICAM SM Illu.2   **REG. PAGE NO.**

Jain Bros. acquired a machine on 1st July, 2021 at a cost of Rs. 14,00,000 and spent Rs. 1,00,000 on its installation. The firm writes off depreciation at 10% p.a. every year. The books are closed on 31st December every year. Required, Show the Machinery Account on diminishing balance method for the year 2021 and 2022.

Q5.   WDV Question ICAM SM Q2   **REG. PAGE NO.**

The Machinery Account of a Factory showed a balance of Rs. 19,00,000 on 1st January, 2022. Its accounts were made up on 31st December each year and depreciation is written off at 10% p.a. under the Diminishing Balance Method. On 1st June 2022, a new machinery was acquired at a cost of Rs. 2,80,000 and installation charges incurred in erecting the machine works out to Rs. 8,920 on the same date. On 1st June, 2022 a machine which had cost Rs. 4,37,400 on 1st January 2020 was sold for Rs. 75,000. Another machine which had cost Rs. 4,37,000 on 1st January, 2021 was scrapped on the same date and it realised nothing. Write a machinery account for the year 2022, allowing the same rate of depreciation as in the past, calculating depreciation to the nearest multiple of a Rupee.

Q6.   WDV Method   **REG. PAGE NO.**

A firm purchased on 1st January, 2018 certain machinery for Rs. 5,82,000 and spent Rs. 18,000 on its erection. On July 1, 2018 another machinery for Rs. 2,00,000 was acquired. On 1st July, 2019 the machinery purchased on 1st January, 2018 having become obsolete was auctioned for Rs. 38,600 and on the same date fresh machinery was purchased at a cost of Rs. 4,00,000. Depreciation was provided for annually on 31st December at the rate of 10 per cent p.a. on written down value.

Required: Prepare machinery account.

Q7.   SOYD Method ICAI SM Illu.3   **REG. PAGE NO.**

M/s Akash & Co. purchased a machine for Rs. 10,00,000. Estimated useful life and scrap value were 10 years and Rs. 1,20,000 respectively. The machine was put to use on 1.1.2017. Required, Show Machinery Account and Depreciation Account in their books for 2022 by using sum of years digits method.

Q8.   Machine Hour Rate Method Basic Question ICAI SM Illu.4   **REG. PAGE NO.**

A machine was purchased for Rs. 30,00,000 having an estimated total working of 24,000 hours. The scrap value is expected to be Rs. 2,00,000 & anticipated pattern of distribution of effective hours is as follows:

Year

1 - 3   3,000 hours per year

4 – 6   2,600 hours per year

7 – 10   1,800 hours per year

Required, Determine Annual Depreciation under Machine Hour rate Method.

Q9.   Depletion Method Basic Question ICAI SM Illu.6   **REG. PAGE NO.**

M/s Surya & Co. took lease of a quarry on 1-1-2019 for Rs. 1,00,00,000. As per technical estimate the total quantity of mineral deposit is 2,00,000 tonnes. Depreciation was charged on the basis of depletion method. Extraction pattern is given in the following table:

Year	Quantity of Mineral Extracted
2019	2,000 Tonnes
2020	10,000 Tonnes
2021	15,000 Tonnes

Required, Show the Quarry Lease Account and Depreciation Account for each year from 2019 to 2021.

Q10. Normal Method and Prov. For Depr. Method of Accounting ICAI SM Illu.8 REG. PAGE NO.

On April 1, 2019 Shubra Ltd. purchased a machinery for Rs. 12,00,000. On Oct 1, 2021, a part of the machinery purchased on April 1, 2019 for Rs. 80,000 was sold for Rs. 45,000 and a new machinery at a cost of Rs. 1,58,000 was purchased and installed on the same date. The company has adopted the method of providing 10% p.a. depreciation on the written down value of the machinery.

Required : Show the necessary ledger accounts for the years ended 31 st March, 2020 to 2022 assuming that (a) 'Provision for Depreciation Account' is not maintained (b) Provision for Depreciation Account is maintained.

Q11. Change in Method of Depreciation – WDV to SLM ICAI SM Illu.10 REG. PAGE NO.

M/s Anshul & Co. commenced business on 1st January 2017, when they purchased plant and equipment for Rs.7,00,000. They adopted a policy of charging depreciation at 15% per annum on diminishing balance basis and Over the years, their purchases of plant have been:

1st Jan 2018   Rs. 1,50,000
1st Jan 2021   Rs. 2,00,000

On 1-1-2021 it was decided to change the method and rate of depreciation to straight line basis. On this date remaining useful life was assessed as 6 years for all the assets purchased before 1.1.2021 with no scrap value and 10 years for the asset purchased on 1.1.2021.

Required: Calculate the difference in depreciation to be adjusted in the Plant and Equipment Account for the year ending 31st December, 2021.

Q12. Amortisation on Intangible Assets ICAI SM Illu.13 REG. PAGE NO.

Kumar R&D Co. registered a patent (the patent meets the criteria of an intangible asset) on 1st July, 2021 developed at a cost of Rs. 28,00,000 and spent Rs. 2,00,000 towards legal fees and registration. The patent is granted for a period of 10 years. The books are closed on 31st December every year.

Required, Show the Patent Account and Amortisation Account for the year 2021 and 2022.

Q13. Amortisation on Intangible Assets ICAI SM Illu.14 REG. PAGE NO.

Prime Streaming Co. acquired the streaming rights of a movie for Rs. 18,00,000 with the contracted duration of the streaming period being 10 years. At the beginning of the fourth year, based on the decline in viewership, Prime Streaming Co. decided to stream the movie only for the next 5 years.

Required, Calculate amortisation for the fourth year.

Q14. Short Question on SLM REG. PAGE NO.

A Machine costing Rs. 6,00,000 is depreciated on straight line basis, assuming 10 years working life and Nil residual value, for three years. The estimate of remaining useful life after third year was reassessed at 5 years.

Required: Calculate depreciation for the fourth year.

Q15. Short Question on Revaluation REG. PAGE NO.

A machine of cost Rs. 12,00,000 is depreciated straight-line assuming 10 year working life and zero residual value for three years. At the end of third year, the machine was revalued upwards by Rs. 60,000 the remaining useful life was reassessed at 9 years.

Q16. Short Question on SLM REG. PAGE NO.

A Machinery costing Rs. 20,00,000 is depreciated on straight line assuming 10 years working life and nil salvage value for four years. At the end of the fourth year, the machinery was revalued upwards by Rs. 80,000. The remaining useful life of the machinery was also reassessed as 8 years at the end of the fourth year. Calculate the depreciation for 5th Year.

Q17. Provision for Depreciation Method (SLM) ICAI SM Q1----DZH Special   REG. PAGE NO.

A firm's plant and machinery account at 31st December 2021 and the corresponding depreciation provision account, broken down by year of purchase are as follows:

YEAR OF PURCHASE	PLANT & MACHINERY (At Cost) Rs.	DEPRECIATION PROVISION Rs.
2005	2,00,000	2,00,000
2011	3,00,000	3,00,000
2012	10,00,000	9,50,000
2013	7,00,000	5,95,000
2020	5,00,000	75,000
2021	3,00,000	15,000
TOTAL	30,00,000	21,35,000

Depreciation is at the rate of 10% per annum on original cost. It is company's policy to assume that all purchases, sales or disposal of plant occurred on 30th June in the relevant year for the purpose of calculating depreciation, irrespective of the precise date on which these events occurred.

During 2015 the following transactions took place:
1.   Purchase of plant and machinery amounted to Rs. 15,00,000.
2.   Plant that has been bought in 2011 for Rs. 1,70,000 was scrapped.
3.   Plant that has been bought in 2012 for Rs. 90,000 was sold for Rs. 5,000.
4.   Plant that has been bought in 2013 for Rs. 2,40,000 was sold for Rs. 15,000.

You are required to calculate the provision for depreciation of plant and machinery for the year ended 31st December 2022. In calculating this provision you should bear in mind that it is company's policy to show any profit or loss on disposal of plant as a completely separate item in the profit and loss account. You are also required to prepare the following ledger accounts during the year 2022.
(i)   Plant and Machinery Account (at Cost);
(ii)   Depreciation Provision Account
(iii)   Sale of Disposal of Plant and Machinery Account.

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"SUCCESS is not how high one climb but it depends on how one Bounces back when he falls down"
- Anshul A. Agrawal