14.06.22.

UNIT - IV

Depreciation

→ Value of assets decreases in every year.

Method of Depreciation.

i) Straight line Method of Depreciation.
ii) Declining Balance
iii) Sum of years Digits
iv) Sunk fund
v). Service output.

STRAIGHT LINE METHOD OF DEPRECIATION.

→ Fixed amount of Depreciation.

P - Fixed cost of the asset.
F - Salvage Value / future resale value.
N - No. of years. [Life of the Asset]
D_t - Depreciation amount for period (t)
B_t - Book value for period (t)

$$D_t = (P - F) / n$$
$$B_t = B_{t-1} - D_t \; / \; B_{t-1} - D_t.$$

$$\boxed{D_t = P - F / n}$$

$$\boxed{B_t = B_{t-1} - D_t}$$

Specific period (t)

$$\boxed{B_t = P - t \times D_t}$$
$$= P - t \times \boxed{(P-F)/n}$$

1.) A company has purchased an equipment whose 1st first cost is Rs. 1,00,000 with an estimated life of 8 years. The estimated salvage value of the equipment at the end of life time of is Rs: 20,000 Determine the Depreciation charge & Book value at the end various years using Straight Line method of Depreciation.

Ans Given :

$P = Rs: 1,00,000/-$

$n = 8$ years

$F = Rs: 20,000$

$D_t = ?$

$B_t = ?$

$D_t = (P - F)/n$

$= (1,00,000 - 20,000)/8$

$= (80,000)/8$

$= Rs: 10,000/-$

$$\boxed{D_t = 10,000/-}$$

$$B_t = B_{t-1} - D_t.$$

Period (t)	Depreciation (D_t)	Bookvalue (B_t)
0	-	100,000
1	10,000	90,000
2	10,000	80,000
3	10,000	70,000
4	10,000	60,000
5	10,000	50,000
6	10,000	40,000
7	10,000	30,000
8	10,000	20,000

Speiific period (t)

$t = 4$

$$B_4 = P - t \times [(P-F)/n] \rightarrow D_t$$

$$= 100,000 - 4 \times [10,000]$$

$$= 1,00,000 - 40,000$$

$$= \text{Rs: } 60,000/-$$

ii) DECLINING BALANCE METHOD :-

⇒ Constant percentage of the Book Value of the previous period of the Asset will be charged as the Depreciation amount for the current period.

k = Constant percentage

$$D_t = k \times B_{t-1}$$

$$B_t = B_{t-1} - D_t.$$

Specific year (t)

$$D_t = k(1-k)^{t-1} \times P$$

$$B_t = (1-k)^t \times P$$

(2) Given.

$P = 1,00,000 \quad K = 0.2 \quad F = 20,000 \quad , \quad n = 8$

$D_t = K \times B_{t-1}$

After 1 year

$= 0.2 \times 1,00,000$

$D_t = 20,000$

$B_t = B_{t-1} - D_t$

$= 1,00,000 - 20,000$

$= 80,00,000.$

After 2 yr

$D_{t=2} = 0.2 \times 80,000$

$D_t = 16,000$

$B_t = 80,000 - 16,000$

$= 64,000/--$

Period (t)	Depreciation (D_t)	Book value B_t
0	-	1,00,000
1	20,000	80,000
2	16,000	64,000
3	12,800	51,200
4	10,240	40,960
5	8,192	32,768
6	6,553	26,215
7	5243	20,972
8	4,194	16,778

After 4 years

$$D_{t=4} = 0.2(1-0.2)^{4-1} \times 1,00,000$$

$$= 0.2(0.8)^3 \times 1,00,000$$

$$= 0.2(0.512)$$

$$= 0.1024 \times 1,00,000$$

$$= 10,240/-$$

$$B_{t=4} = (1-0.2)^4 \times 1,00,000$$

$$= (0.8)^4 \times 1,00,000$$

$$= 0.4096 \times 1,00,000$$

$$= 40,960/-$$

iii) SUM OF YEARS DIGITS :-

$$D_t = \text{Rate} \times (P-F)$$

$$B_t = B_{t-1} - D_t.$$

$$\text{Sum of Digits} = \frac{n(n+1)}{2}$$

$$\text{Rate} = \frac{\text{no. of years}}{\text{Sum of Digits}}$$

Specific year (t)

$$D_t = \frac{n-t+1}{[n(n+1)]/2} [P-F]$$

$$B_t = [P-F] \frac{[n-t]}{n} \frac{[n-t+1]}{n+1} + P$$

③ $\text{Rate} = \dfrac{n}{\text{Sum of Digits}} = \dfrac{8}{\frac{n(n+1)}{2}} = \dfrac{8}{\frac{8(9)}{2}} = \dfrac{8}{72/2}$

$= \dfrac{8}{36}$

Given:

$P = 1,00,000$

$F = 20,000$

$\text{Rate} = 8/36$

$D_t = \text{Rate} \times (P - F)$

$= \dfrac{8}{36} \times (1,00,000 - 20,000)$

$= \dfrac{8}{36} \cdot (80,000)$

$= 0.222 \times (80,000)$

$= 17,760/-$

$B_t = B_{t-1} - D_t$

$= 1,00,000 - 17,760 = 82,240/-$

Period / Rate	Depreciation	Book Value.
0	-	1,00,000
1 = 8/36	17,760/-	82,240/-
2 = 7/36	15,555/-	66,684/-
3 = 6/36	13,333/-	53,350/-
4 = 5/36		
5 = 4/36		
6 = 3/36		
7 = 2/36		
8 = 1/36		

iv) SINKING METHOD OF DEPRECIATION

→ Book value decreases at increasing rate.

P F n Bt Dt

A - Annual equalent amount
i - rate of return component annually

Formula :-

$$A = (P - F) \times [A/F, i, n]$$

$$D_t = (P - F) \times [A/F, i, n] \times [F/P, i, t-1]$$

$$B_t = P - [P - F] \times [A/F, i, n] \times [F/P, i, t]$$

A/F , 10% , 4

(4) P = 1,00,000 F = Rs: 20,000 n = 8
i = 12%

$A = [(P - F) \times [A/F, i, n]$ { fixed Depreciation for every year.

$= (100,000 - 20,000) \times [A/F, 12, 8]$

$= 80,000 \times .0813$

A = 6504

End of year	Fixed Depreciation	Net Depreciation	Book value.
0	6504	-	1,00,000
1	6504	6504.	93,496
2	"	7284.48	86,211.52
3	"	8156.01	78055.51
4	"		
5	"		
6	"		
7	"		
8	6504.		

$D_2 = (P-F) \times [A/F, i, n] \times [F/P, i, t-1]$

$= 80{,}000 \times [A/F, 12, 8] \times [F/P, 12, 2-1]$

$= 80{,}000 \times 0.0813 \times \cancel{1.254}\ 1.120$

$= 7284.48$

$D_3 = (P-F) \times [A/F, 12, 8] \times [F/P, 12, 2]$

$= 80{,}000 \times 0.0813 \times 1.254$

$= 8156.01$

$B_2 = B_{t-1} - D_t$

$= 93{,}496 - 7284.48$

$= 86{,}211.52$ //

v) SERVICE OUTPUT METHOD.

X - maximum capacity of service
x = quantity of service used / rendered.

P = 80,00,000
F = 50,000
x = 2,000 km. - 3 yrs.
X = 75,000 km - 5 yrs.

Depreciation unit of service = $P-F/X$

Depreciation of a unit of service in a period = $\frac{P-F}{X} \times x$

Depreciation for 3 years = $\frac{80,00,000 - 50,000}{75,000} \times 2,000$

= 212,000