**Depreciation**

Is an artifice that reflects the decrease in the asset's value over time or with usage .

\*not cash flow

**1-Straight Line Depreciation ( SLN ) :**

Annual depreciation charges from a uniform annual series

dt =

βt= P –( t dt)

dt : depreciation allowed at end of each year t : no. of year P:present value

βt :Unrecovered investment book value at end of each year F : salvage value

**2-Declining balance Depreciation ( DB )**

Larger depreciation chargers in the early years and smaller depreciation years in the later years . (negative geometric series )

dt = ρ P , βt =

at Declining ( DB ) ρ = 1 –

at **Double** Declining ( DDB ) ρ = = ( ρ = = )

**\* Declining balance with switch to ( SLN )**

dt =

βt =

Used SLN & DB(or DDB) , then choice the larges between them and contract from βt even end of year .

**3- Sum of years Digits Depreciation**

dt = (P – F )

βt =(P – F ) + F

**Ex.1**

**P = 1600 000 , F = 100 000 , n=5**

**a) By Straight Line**

dt = = 300 000

|  |  |  |
| --- | --- | --- |
| Bt | dt | Eoy |
| 1 600 000 | - | 0 |
| 1 300 000 | 300 000 | 1 |
| 1 000 000 | 300 000 | 2 |
| 700 000 | 300 000 | 3 |
| 400 000 | 300 000 | 4 |
| 100 000 ≥ s.v o.k | 300 000 | 5 |

**b) Declining balance depreciation :**

ρ = 1 – () = 0.426

dt = 1 600 000 ( 0.426)

dt = 681 600

|  |  |  |
| --- | --- | --- |
| βt | dt | EOY |
| 1 600 000 | - | 0 |
| 918 400 | 681 600 | 1 |
| 527 161.6 | 391 238.4 | 2 |
| 302590.76 | 224570.8 | 3 |
| 173687.1 | 128903.66 | 4 |
| 99 696.39 ≤ s.v Not o.k | 73 990.7 | 5 |
| 100 000 o.k | 73 687.1 |  |

**c- sum of years digits Depreciation :**

dt = ( 1 500 000 )

|  |  |  |
| --- | --- | --- |
| βt | dt | Eoy |
| 1 600 000 | - | 0 |
| 1 100 000 | 500 000 | 1 |
| 700 000 | 400 000 | 2 |
| 400 000 | 300 000 | 3 |
| 200 000 | 200 000 | 4 |
| 100 000 ≥ s.v | 100 000 | 5 |

**C- Double Declining depreciation ( 200% )**

ρ = = = 0.4

dt = 1 600 000 ( 0.4 )

dt = 640 000

|  |  |  |
| --- | --- | --- |
| tβ | dt | EOY |
| 1 600 000 | - | 0 |
| 960 000 | 640 000 | 1 |
| 576 000 | 384 000 | 2 |
| 345 600 | 230 400 | 3 |
| 207 360 | 138 240 | 4 |
| 124 416 ≥ s.v | 62 944 | 5 |

**d) Double declining Switching to ( SLN ) [200%]**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| βt | Dt ( SLN ) |  | Dt ( DB) | EOY |
| 1 600 000 | - | > | - | 0 |
| 960 000 | 300 000 | > | 640 000 | 1 |
| 576 000 | 215 000 | > | 384 000 | 2 |
| 345 000 | 158 666.67 | > | 230 400 | 3 |
| 207 360 | 122 800 | > | 138 240 | 4 |
| 100 000 | 107 360 | > | 82 944 | 5 |

Dt ( SLN ) =

Other method to find Dt :

a – Units of production method

Ut = Unit during year

U = Total unit in life

b- Operation day ( hr ) method

Qt = Unit during year

Q = Total Unit

C-Income for cost method

Rt= Rental income during year

R = Total useful life income

Ex.2

1. A small truck is production for SR 270,000 . The truck is expected to be of use to the company for 5 years , after which it will be sold for SR 40,000 . Calculate the depreciation deduction and the resulting un recovered investment during each year of the asset's life .
2. Use straight –Line depreciation
3. Use sum of the year's digits depreciation .
4. If for the same truck , depreciation is calculated based on mileage driven and expected mileage per year is :

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year | 1 | 2 | 3 | 4 | 5 |
| Mileage( km) | 85,000 | 72,000 | 60,000 | 45,000 | 38,000 |

Calculate the depreciation deduction and the resulting unrecovered investment during each year the truck's life according to units of production method .

Solution :

a-i

P = 270 000 , n = 5 , sv = 40 000

|  |  |  |
| --- | --- | --- |
| N |  | βt |
| 0 | - | 270 000 |
| 1 | 4 600 | 265 400 |
| 2 | 4 600 | 260 800 |
| 3 | 4 600 | 256 200 |
| 4 | 4 600 | 251 600 |
| 5 | 4 600 | 247 000 > s.v |

a-ii

|  |  |  |
| --- | --- | --- |
| N | dt = ( P – F ) | βt |
| 0 | - | 270 000 |
| 1 | 76 666 | 193 334 |
| 2 | 61 333 | 132 001 |
| 3 | 46 000 | 86 001 |
| 4 | 30 666 | 55 335 |
| 5 | 15 333 | 40 002 |

B- mileage per year

|  |  |  |  |
| --- | --- | --- | --- |
| N | Mileage | Dt | βt |
| 0 | - | - | 270 000 |
| 1 | 85 000 | 25 166.8 | 244 833 |
| 2 | 72 000 | 55 200 | 189 633 |
| 3 | 60 000 | 46 000 | 143 633 |
| 4 | 45 000 | 34 500 | 109 133 |
| 5 | 38 000 | 29133.5 | 80 000 |
| Total = 300 000 | |  | |

Ex.3

A small factory has purchased a vehicle for SR 10 000 with an anticipated salvage of SR 500 after 8 years of service . Compute the depreciation deduction and the resulting un covered investment during each year of that period using 200% declining balance switching to straight-line depreciation .

Solution :

P = 10 000 , F = 500 , n = 8 , R = 200%

|  |  |  |  |
| --- | --- | --- | --- |
| Year | D ( DB ) | D ( SLN ) | βt |
| 0 | - | - | 10 000 |
| 1 | 2 500 | 1 187 | 7 500 |
| 2 | 1 875 | 1 000 | 5 625 |
| 3 | 1 406 | 854.1 | 4 218 |
| 4 | 1 054 | 743.8 | 3 164 |
| 5 | 791 | 666 | 2 373 |
| 6 | 593 | 624 | 1 748 |
| 7 | 437 | 624 | 1 124 |
| 8 | 281 | 624 | 500 |