Depreciation

الاندثار (الاستهلاك)

Depreciation: is the process of allocating the cost of a plant asset over its useful (service) life in a rational and systematic manner. Cost allocation enables companies to properly match expenses with revenues in accordance with the expense recognition principle.

1. **Cost**: Earlier, we explained the issues affecting the cost of a depreciable asset. Recall that companies record plant assets at historical cost, in accordance with the measurement principle.

2 .**Useful life:** Is an estimate of the expected productive life, also called service life, of the asset for its owner. Useful life may be expressed in terms of time, units of activity (such as machine hours), or units of output. Useful life is an estimate. In making the estimate, management considers such factors as the intended use of the asset, its expected repair and maintenance, and its vulnerability to obsolescence. Past experience with similar assets is often helpful in deciding on expected useful life. We might reasonably expect.

3. **Salvage (residual) value**: Is an estimate of the asset's value at the end of its useful life. This value may be based on the asset's worth as scrap or on its expected trade-in value. Like useful life, salvage value is an

estimate. In making the estimate, management considers how it plans to dispose of the asset and its experience with similar assets.

4. Book value: (Cost less accumulated depreciation).

5. Depreciable base: (Cost less salvage value).

Depreciation is generally computed using one of the following methods:

1- Time- Based Depreciation Methods:

a) Straight-line method: Allocates an equal amount of depreciable base to each year of assets service.

To compute depreciation expense under the straight-line method we use the following formula;

Annual depreciation= (Cost – salvage value) ÷ estimated useful life

Also we can use Straight-line rate to compute annual depreciation. Simply straight-line rate is one divided by the number of years in the asset's service live.

For example, the straight- line rate for an asset with a five –year is one-fifth or 20% (1÷5×100%).

Example 1: Baghdad Company purchased a machine for ID 250000. The company expects the service live of the machine to be five years. During that time, it is expected that the machine will produce 140000 units. The residual or salvage value is ID 40000. The machine was disposed after

five years of use. Actual production during the five years of the asset's life was:

Year	Units produced
1	24000
2	36000
3	46000
4	8000
5	16000
Total	130000

Required:

Calculate annual depreciation for the five – year using straight- line method. Round all computations to the nearest Iraqi dinner.

Solution:

Annual depreciation = (cost- salvage value) ÷ 5 years

$$= \frac{(ID\ 250000-40000)}{5\ years} = ID\ 42000\ per\ year$$

Also we can use straight- line rate to compute annual depreciation

Straight- line rate = (100% ÷ useful life) = (%100 ÷ 5 years) = 20%

Annual depreciation = (ID 250000- 40000) × 20% = ID 42000
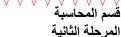
b) Double Declining balance method: An accelerated depreciation pattern can be achieved by appropriate in special situations. In this method will

not use depreciable base (Cost- savage value), but it use (cost – accumulated depreciation). So the formula will be;

Annual depreciation= (Cost- accumulated depreciation) × (%100÷ life)×2

Example 2: By using above information in example (1) calculate the depreciation by using Double declining balance method.

Solution:

Annual depreciation for year 1= (250000- 0) × (%100÷5) ×2

= 250000×%40= 100000

Year	Book Value Beginning of year	× Rate per year	Depreciation = Depreciation	Book Value End of year
1	ID 250000	%40	100000	150000
2	150000	% 40	60000	90000
3	90000	% 40	36000	54000
4	54000	%40	*14000	40000
5	40000			
Total			ID210000	

*Amount necessary to reduce book value to salvage value

C) Sum-of- the – years- digits method: In this method the annual depreciation compute according to the following formula;

$$\text{Sum of the years digits} = \frac{n(n+1)}{2}$$

Example: By using above information in example (1) compute depreciation by using sum-of- years-digits.

Solution:

Depreciable base = (Cost – salvage) = (250000 – 40000) = 210000

$$\frac{n(n+1)}{2} = \frac{5(5+1)}{2} = 15$$

Year	Depreciable Base	×	Depreciation Rate per year	=	Depreciation	Book value End of year
1	ID 210000		5/15		ID 70000	180000
2	210000		4/15		56000	124000
3	210000		3/15		42000	82000
4	210000		2/15		28000	54000
5	210000		1/15		14000	40000
Total			15/15		ID 210000	

2- Activity Based Depreciation method:

Under the units-of-activity method, useful life is expressed in terms of the total units of production or use expected from the asset, rather than as a time period. The units of- activity method is ideally suited to factory machinery. Under units-of-activity method we use the following formula;

$$\text{Annual depreciation} = \frac{(\text{cost- salvage value}) \times \text{produced units}}{\text{Total estimated production units}}$$

Solution: First step is compute depreciation rate per unit as following;

$$\frac{\text{Cost- salvage}}{\text{Total estimated production units}}$$

$$= \frac{\text{ID } 250000 - 40000}{140000 \text{ Units}} = \text{ID } 1.50 \text{ per unit}$$

Year	Units Produced	Depreciation × Rate per unit	=	Depreciation	Book value End of year
1	24000	ID 1.50		ID 36000	ID 214000
2	36000	1.50		54000	160000
3	46000	1.50		69000	91000
4	8000	1.50		12000	79000
5	16000	1.50		39000*	40000
Total	130000			ID 210000	

*Amount necessary to reduce book value to salvage value

Treatment of depreciation:

Depreciation is treated as expenses shown in income statement and accumulated depreciation shown in the balance sheet deducted from its related assets, for example accumulated depreciation of equipment shown under (deducted) equipment assets. The company computes depreciation on 31/12/20 or during the year, when the company dispose of the assets by recoding the following entry:

Depreciation expense--------------income statement

Accumulated depreciation expense- equipment --------Balance sheet

To record depreciation expense for……..

Q1: On January 1, 2003 Baghdad Company purchased a machine for ID 22000. The company expects the service live of the machine to be five years and it will be worth ID 2000 at the end of its five-year service life. During that time, it is expected that the machine will produce 100000 units Actual production during the five years of the asset's life was:

Year	Units produced
2003	22000
2004	24000
2005	15000
2006	20000
2007	21000
Total	**102000**

Required: Calculate annual depreciation for the five- year life of the machine by using of the following methods. (Round all computations to the nearest Iraqi dinner).

1- Double declining balance method.

2- Sum-of-the-years digits.

3- Units of production method.