



CHEMICAL ENGINEERING

Plant Design Economics (PDE)

Hand Notes For GATE, IES, PSUs & Competitive Exam

Hand Notes

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EconomicsTotal Capital Investment:-

It is a total investment required to start a project.

Consist of two types

→ Fixed Capital Investment

Actually capital invested for start of plant

→ Working Capital Investment
to fulfil plant worse condition.

→ Manufacturing FC-I
→ Non-Manufacturing FC-I

* Fixed C.I.:-

It is the capital needed to supply the necessary manufacturing and plant facilities and It is the actual money that is invested in the project.

→ Manufacturing fixed Capital:-

Money that is directly related to the ^{plant} ^{production} process operation.

ex → equipment, piping, electricity, raw material cost etc.
installation, manufacturing,

→ Non-Manufacturing fixed Capital:-

Money that is indirectly related to the process operation

ex → shops utilities, facilities for employees, construction overhead etc.
administrative office.
all office indirectly related
accounting office

* Working C.I.:- money, that we keep with us for emergency purposes.

Capital necessary for the handling of emergency purposes.
ex → in case of strike.

* Depreciation:-

0	V_0	3L
1	V_1	2.4L
2	V_2	2.0L

> (or) Depreciation.

These values are known as Book Value
or
(V_n) / Asset Value

n service life \rightarrow (10)
 \rightarrow salvage value $V_s \neq 0$
 \rightarrow scrap \rightarrow $V_s = 0$

Book Value

It is the net present value of the equipment at the end of the year. It is represented by V_a . Which means yearly cost with net present value of the equipment at the end of the year 'a'

$$d_a = V_{a-1} - V_a$$

Depreciation
amt

Service Life:-

The period during which the use of the property is economically feasible is known as the service life. It is denoted by 'n'.

Salvage/Scrap Value:-

Salvage is the net amt of money obtainable from the sale of used property over and above any charges involved in the removal and sale. (over & above charge is deinstallation)

Scrap is the value obtainable from the equipment is negligible then it is dismantled and sold as junk. The profit then obtained is known as the scrap value.

It is represented as V_s .

Salvage value $V_s \neq 0$
 Scrap " $V_s = 0$

Depreciation:-

Equipments, buildings, and other material objects comprising a manufacturing plant require an initial investment, which must be written off as an manufacturing expense. In order to write right