Thermodynamics

Books : Cengel & Boles ⇒ Theory

P.K. Nag ⇒ Questions

Questions → Work Book → Class / Gdrive

Questions → Theory Book

→ GATE Previous Year

→ ESE PYQ (5 Year)

→ GATE OTS

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HW

TH-B

P-224

Q8, Q9

"Reversible & Irreversible"

↳ Video

Prime

Youtube

Amrinder Sir entropy

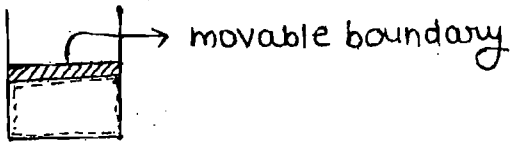
"Civil Services questions"

*Thermodynamics –

It is a branch of science which deals with energy interaction and its effect on system and surrounding.

→ Energy – It is the Ability to cause changes.

→ System – It is a fixed mass (control mass) ~~system~~ or a region in a space (control Volume) where our study is focused.

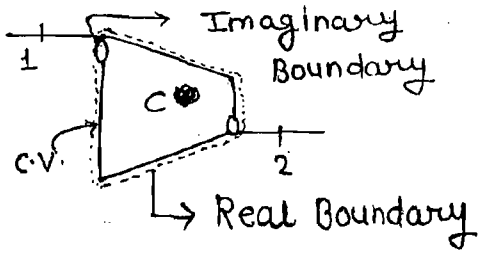


→ Surrounding – Everything except the system becomes surrounding.

- The Part of surrounding which is direcHy affected by the system is called Immediate surrounding.

→ Boundary – It is a real or imaginary surface which separates the system from the surrounding.

Boundary can be fixed or movable.

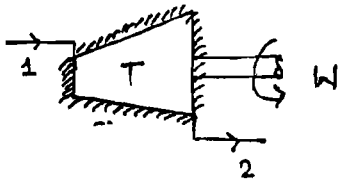


Type of System :→

Type of system	Mass	Energy	Example
1. closed	X	✓	Piston cylinder without valves
2. open	✓	✓	Piston cylinder with valves
3. Isolated	X	X	Perfectly insulated thermos universe

	Mass	Work	Heat
Insulated	✓	✓	×
Isolated	×	×	×

→ eg. insulated turbine



- Properties of the System :→

Any characteristics of the System is called as the Property of the System. and the Properties can be classified as :

1. Intensive (Intrinsic) :→

Independent of mass of the System under Consideration.

eg. P, T, e, u, velocity (c), thermal conductivity (k)

NOTE: All Specific Properties are intensive Properties,

eg. h, s, u, w, q, C (Specific heat)

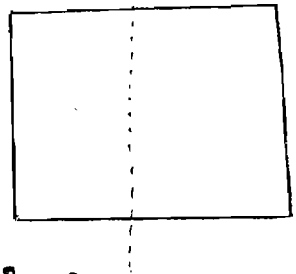
2. Extensive (Extrinsic) : →

Depense of mass of the System Under Consideration.

eg. E, V, m, Entropy, Enthalpy, Internal Energy

$C_{rms}^2 \propto T$

$\frac{1}{2} m_1 c_1^2 + \frac{1}{2} m_2 c_2^2 + \cdots = \frac{1}{2} \Sigma m C_{rms}^2$



$P_L = P$

$T_L = T$

$V_L = V/2$