

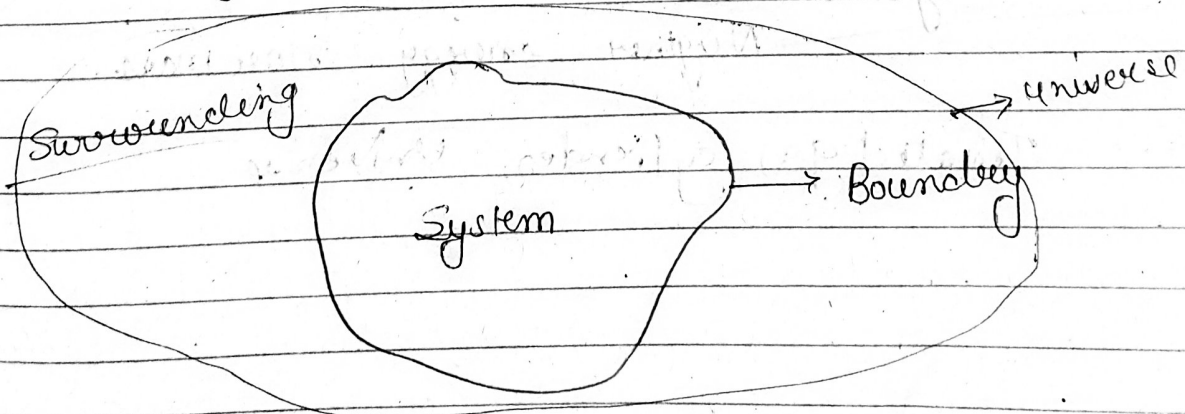
Basic Concept:

Thermodynamics is the branch of science, which deals with energy interaction of the system with surrounding and its net effect on the system.

System:- System is a body on which our analysis depends.

Surrounding:- All the things away from system is known as surrounding.
(Real or imaginary)

Boundary:- A boundary is a line which separates system from surrounding.



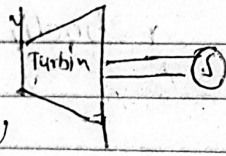
Universe:- Summation of system & surrounding is known as universe.

Types of system	System	Energy Transferred	Mass Transferred
		E.T.	M.T.
	1. Open system,	✓	✓
	2. closed system,	✓	—
	3. Isolated system,	—	—

1. Open System :-

परिभाषा

A system is open system when energy as well as mass transferred.



piston cylinder with valves is open

2. Closed system :-

A egg

A system is closed system when only energy is transferred not at all any mass.

piston cylinder arrangement without valves

3. Isolated system :-

Neither energy nor mass.

Ex. Isolated gas cylinder, universe

Engineers app^o

* Macroscopic & Microscopic Approach :-

Quantum Approach

(Statistical Analysis approach)

Large No. of Variable & propul.

Small propul.

In microscopic approach behaviours of all molecules should be analysed & in macroscopic approach the average behaviour of molecules is considered.

NOTE: Engineers thermodynamics concern with only with macroscopic approach.

वैश्विक के लिए ही उपयुक्त है (property)

* THERMODYNAMICS PROPERTIES :-

In property

A property represent a true characteristic of system. There are two types:

Intensive properties Extensive properties

1. Intensive properties :- (Independent of mass) Those properties which are independent of mass.

* All the specific energy intensive properties, or the ratio of two Ex. properties, are intensive properties.

2. Extensive properties :- Those property depends upon mass.

* All the energy are Ex. property.

P, T, m V, C_p	\Rightarrow	P	P ← Intensi
		T	T
		$m/2$	$m/2$ ← Ext
		$V/2$	$V/2$
		C_p	C_p

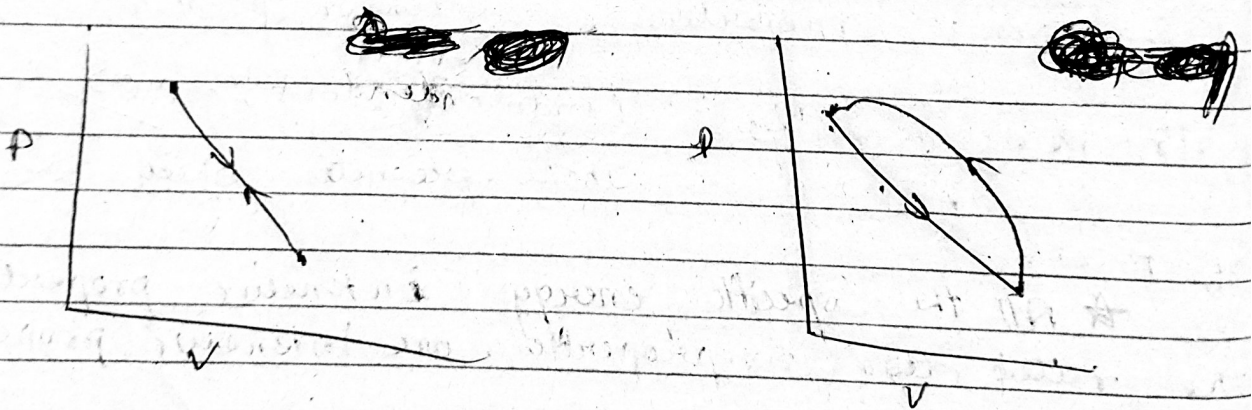
★ (States in समुदाय)

State :- State represents the position or condition of system.

Process :- The change of state is known as process

PATH :- A path followed by during a process.

Reversible & Irreversible process :-

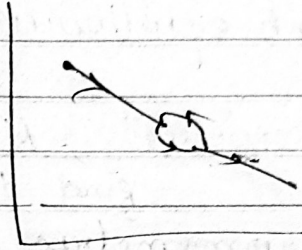


A process is said to be reversible in which system returns to its original state without leaving any effect on surrounding.

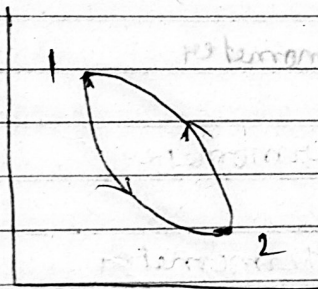
Temperature \Rightarrow $1/273.15^{\text{th}}$ of triple point of water.

NOTE: During a reversible process a path followed by the system in forward direction is same in reverse direction.

Irreversible process:



Cyclic process:-



* initial and final point of system same.

NOTE:- minimum two process are required for a cyclic process.