Bernoulli's Theorem - Quick Revision Sheet

Definition: In steady, incompressible and frictionless fluid flow, the total energy (Pressure energy + Kinetic energy + Potential energy) remains constant at every point.

Formula: $P/\rho g + v^2/2g + z = \text{constant}$

Diagram: Venturi tube showing pressure drop at narrow section (Venturi effect).

Applications:

Application	Description
Venturimeter	Measures fluid flow rate using pressure difference.
Carburetor	Mixes air and fuel in engines using low pressure zone.
Atomizers & Sprays	Used in perfumes, inhalers, coating sprays in pharma.
Airplane Wings	Generates lift due to pressure difference over wing surfaces.
Pipelines	Helps calculate pressure drops for design.
Medical Venturi Masks	Controls oxygen flow for patients.

Limitations:

- Does not consider viscosity (real fluids have friction).
- No heat transfer effects included.
- Assumes incompressible fluids (not accurate for gases).
- Applies only to steady flow conditions.
- Does not account for energy losses in bends, valves, or fittings.