Specific Gravity: It is defined as the ratio of the Weight density (or density) of a fluid to the Weight density (or density) of a standard fluid.

For liquids the standard fluid taken as water and for gases the standard liquid taken as air.

The Specific gravity is also called relative density. It is a dimension less quantity and it is denoted by **S**.

S (for liquids) = weight density of liquid/ weight density of water

**S (for gases) =** weight density of gas /weight density of air

- **VISCOSITY:** It is defined as the property of a fluid which offers resistance to the movement of one layer of the fluid over another adjacent layer of the fluid.

- When the two layers of a fluid, at a distance 'dy' apart, move one over the other at different velocities, say u and u+du. The viscosity together with relative velocities causes a shear stress acting between the fluid layers.

- The top layer causes a shear stress on the adjacent lower layer while the lower layer causes a shear stress on the adjacent top layer.

Water   Olive Oil   Honey

Low viscosity   Medium viscosity   High viscosity

High viscosity   Low viscosity
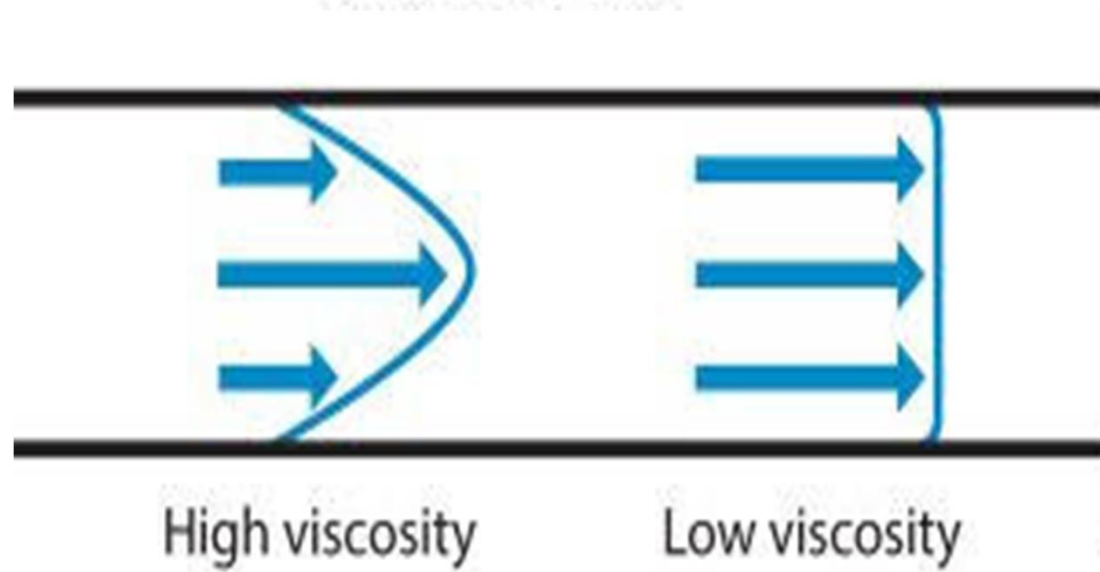
This shear stress is proportional to the rate of change of velocity with respect to y. it is denoted by symbol τ .

Fig. 1.2
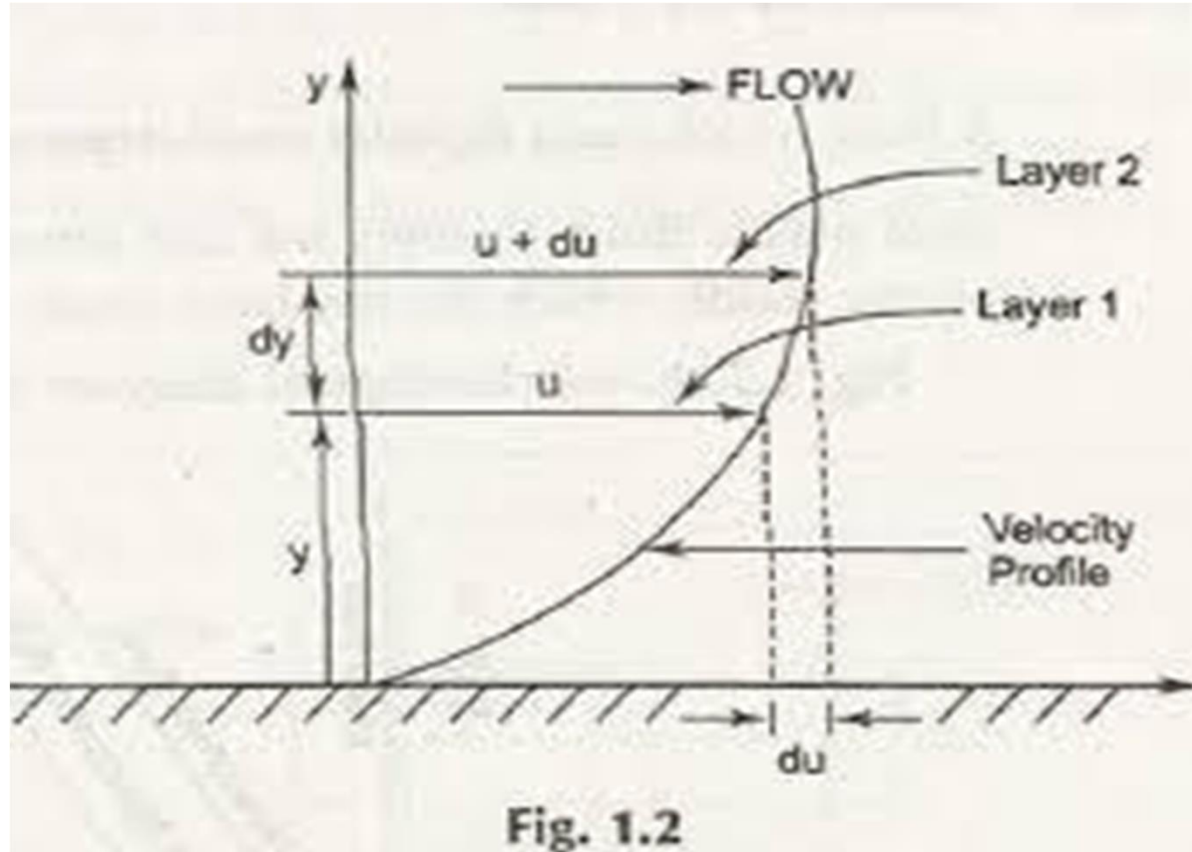
$$\tau \propto du/dy$$

$$\tau = \mu \, du/dy$$

Where μ is the constant of proportionality and is known as the co-efficient of dynamic viscosity or only viscosity.

du/dy represents the rate of shear strain or rate of shear deformation or velocity gradient.

The unit of viscosity in CGS is called poise and is equal to dyne-sec/ cm2