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(Q1) if the velocity distribution over a Plate is $u = 2/3y - y^2$ find shear Stress at $y=0$ and $y=1.5m$, Take dynamic viscosity = 8.63 Poise.

Parabolic distrubtion

As we have "u"

$$du/dy - 2/3 - 2y$$

$$\left(du/dy\right)_{y=0} = 0.667$$

$$\left(du/dy\right)_{y=1} = 2/3 - 2(1.5)$$
$$= 0.367$$

As we given

$u = 8.63$ Poise

$1P = 1/10$ Pa-s

So $u = \frac{8.63}{10}$ Poise $= 0.863$ Pa.s

Now we find T

(viscosity law/Newton law) $T = u\, du/dy$

$\tau_y = 0 = 0.863 \times 0.667$

$= 0.5176$ Pa

So $\tau_y = 1.5 = 0.863 \times 0.367$

$= 0.3167$ Pa

The value of τ reduces

So means resistance

decrease,

* Viscosity:-

- In real fluids, either Liquid or gas. tangetical or shearing forces are developed always whenever there is motion relative to a body. thus Creating fluid friction, because these forces oppose the motion of one particle past another.
- These frictional forces given rise to a fluid Property called viscosity.
- The viscosity of fluid is a measure of its resistance to shear an angular deformation
- The friction in flowing fluids result from cohesion and momentum interchange between molecules:

For example:- Motor Oil is has high viscosity, and resistance to shear, and feels "sticky" whereas has low viscosity.

NEWTON'S EQUATION OF VISCOSITY

- $\tau = F/A = \mu (u/y) = \mu (du/dy)$
- This was first suggested by Sir Isaac Newton (1642-1727) first suggested it.

* Gauge Pressure:-

Gauge Pressure is the pressure relative to atmospheric pressure. Gauge pressure relative is the positive for pressures above atmospheric pressure, and negative for pressures below it. In fact, atmospheric does add to the pressure in any fluid not enclosed in a rigid container.

* Fluid Dynamics?

Fluid dynamics is" branch of applied science that is concerned with the movement of liquids and gases, "according to American Heritage Dictionary, fluid dynamics is one of two branches of fluid mechanics which is the study of fluids and how forces effect them. (the other brancher is fluid statics, which deals with fluids at reast.

Scientists across serveral fields study fluid dynamics, fluid dynamics provides methods for studying the evolution of stars, ocean currents. weather. patterns. plate. tectonics and even blood circulation, some important technological applications of fluid dynamics include rocket engines, wind turbines, oil piplines and air conditioning systems.