Q1 Determine the steady state momentum flux $\tau_y$ at 70°C when the lower plate velocity in the following figure is 9 m/s in the +ve direction of x.

Q2 Estimate viscosity of saturated liquid water at 0°C and 100°C by using the following equations –

$$\mu = \frac{Nh}{V}\exp\left(0.408\frac{\Delta U_{vap}}{RT}\right)$$

$$\mu = \frac{Nh}{V}\exp\left(3.8\frac{T_b}{T}\right)$$

Where N: Avogadro number, h: plank constant, V: molar specific volume, Tb: boiling point and $\Delta U_{vap}$ = 897.5 Btu/lbm at 100°C.

Q3 Predict viscosity of chlorine-air mixtures at 75°F and 1 atm for the following mole fractions of chlorine: 0.00, 0.25, 0.5, 0.75 and 1.00. Consider air as a single component.