Q. 4.) Escape flux from reservoir 1 to 2, $j_{e_1} = \frac{1}{4} n_1 \bar{v}_1$

Escape flux from reservoir 2 to 1, $j_{e_2} = \frac{1}{4} n_2 \bar{v}_2$

Energy flux from reservoir 1 to 2 is:

$$J_{E_1} = \frac{\pi}{6} m n_1 \bar{v}_1^3$$

Energy flux from reservoir 2 to 1 is:

$$J_{E_2} = \frac{\pi}{6} m n_2 \bar{v}_2^3$$

Average energy of molecules escaping from reservoir 1 to 2 is:

$$\langle E \rangle_1 = \frac{J_{E_1}}{j_{e_1}}$$

$$= 2k\bar{T}_1$$

" " 2 to 1 is:

$$\langle E \rangle_2 = 2k\bar{T}_2$$

∴ Average energy of molecule moving across orifice:

$$\langle E \rangle = \langle E \rangle_1 + \langle E \rangle_2$$

$$= 2k(\bar{T}_1 + \bar{T}_2) = 10k\bar{T}_2$$