

35 T6 B.2, B.5, B.6, B.14

B.2 - $V = (.1)^3 \text{ m}^3 = 1 \text{ L}$
 $p = 2 \times 10^{-23} \text{ kNm/s}$
 $sp = .005 \times p \times 2$

states = $\frac{4\pi V}{h^3} p^2 dp = 4\pi \left(\frac{.1}{h}\right)^3 p^3 .01$ (too big/small)
 \uparrow
 $6.63 \times 10^{-34} = 4\pi \left(\frac{.1 p}{h}\right)^3 .01$
 \uparrow
 3×10^9

B.5 $v_p = \left(\frac{2 k_p 273}{28 \times 1.66 \times 10^{-27}}\right)^{1/2} = 402.7 \text{ m/s} = 4\pi \cdot 3.3 \cdot .01 \cdot 10^{27}$
 $\underbrace{\hspace{10em}}_{3.46}$

$u = \frac{v}{v_p} = \frac{250}{402.7} =$

$\int u = \frac{4 \text{ m/s}}{402.7} =$

$\frac{4}{\sqrt{\pi}} u^2 e^{-u^2} du = .59 \times 10^{-2}$

B.6 $v_p = \left(\frac{2 k_p 295}{32 \times 1.66 \times 10^{-27}}\right)^{1/2} = 392 \text{ m/s}$

$u_1 = \frac{300}{v_p} = .766$

$u_2 = \frac{500}{v_p} = 1.277$

$\rightarrow .406$

\uparrow MB&IZ app

or use Mathematic NIntegrate.

B.14 $T = 2950 \text{ K} \rightarrow \frac{2}{k_B T} = .2542 \text{ eV}$
 \uparrow
 $8.617 \times 10^{-5} \text{ eV/K}$

$u_1 = \frac{1.77 \text{ eV}}{k_B T} = 6.963$

$u_2 = \frac{3.1 \text{ eV}}{k_B T} = 12.195$

$\Rightarrow .0756$