CHM 330 - EXAM 4
Prof. A.J. Pounds
Fall 2023

Name_____ **Section**_____

This test is administered under the auspices of the Mercer University Honor Code.

Some Potentially Useful Equations and Constants

$$E_n = \frac{n^2h^2}{8m_eL^2} \qquad \psi_n(x) = \left(\frac{2}{L}\right)^{1/2} \sin\left(\frac{n\pi x}{L}\right)$$

$$\frac{1}{2}m_ev^2 = E_{in} - \Phi \qquad E = h\nu = \frac{hc}{\lambda} = hc\tilde{\nu}$$

$$\hat{H} = T + V = -\frac{\hbar^2}{2m}\frac{d^2}{dx^2} + V(x) \qquad \hat{p} = -i\hbar\frac{\partial}{\partial x}$$

$$E = \frac{\pi^2\hbar^2}{2m}\left(\frac{n_x^2}{L_x^2} + \frac{n_y^2}{L_y^2} + \frac{n_z^2}{L_z^2}\right) \qquad \hat{r} = r$$

$$E = h\nu = hc\tilde{\nu} = \frac{hc}{\lambda}$$

$$1 \text{ atm} = 760 \text{ Torr} = 101325 \text{ Pa} = 1.01325 \text{ bar}$$

$$k_b = 1.380649\times10^{-23} \text{ J}\cdot\text{K}^{-1}$$

$$N_A = 6.02214076\times10^{23} \text{ mol}^{-1}$$

$$R = k_bN_A$$

$$m_e = 9.1093837015\times10^{-31} \text{ kg}$$

$$h = 6.62607015\times10^{-34} \text{ J}\cdot\text{s}$$

$$c = 2.99792458\times10^{8} \text{ m}\cdot\text{s}^{-1}$$