

Physics 212	Midterm II	18 November 98	
7:30–8:50 PM	Closed Book	No Notes	
$N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$	$pV = nRT = NkT$	$R = 8.31 \text{ J/mol} \cdot \text{K}$	$T = T_C + 273^\circ$
$1 \text{ cal} = 4.186 \text{ J}$	$Q = cm\Delta T = Cn\Delta T$	$W = \int_i^f p dV$	$Q = W + \Delta U$
$\overline{KE}_{trans} = \frac{3}{2}kT$	$\frac{1}{2}kT / \text{° freedom}$	$F_c = \frac{q_1 q_2}{(4\pi\epsilon_0)r^2}$	$V = \frac{q}{(4\pi\epsilon_0)r}$
$E = F_c/q$	$E_d = 2k \frac{p}{z}$	$\vec{\tau} = \vec{p} \times \vec{E}$	$\epsilon \oint \kappa \vec{E} \cdot d\vec{A} = q$
$k = 1.38 \times 10^{23} \text{ J/K}$	$\frac{1}{4\pi\epsilon_0} = \frac{8.99 \times 10^9 \text{ N} \cdot \text{m}^2}{\text{C}^2}$	$e = 1.60 \times 10^{-19} \text{ C}$	$W_{ext} = q\Delta V$
$V = \frac{q}{4\pi\epsilon_0 r}$	$x = x_0 + v_0 t + \frac{1}{2}at^2$	$PE = \frac{q_1 q_2}{4\pi\epsilon_0 r}$	$m_e = 9.11 \times 10^{-31} \text{ kg}$

- ♠ There are 4 questions. For full credit [n points] show physics-based reasoning, work, and units.
- ♠ Use no auxiliary aids. Calculators *without* stored equations are OK.
- ♠ Place all books, notes, packs, etc up front.
- ♠ All answer sheets must be handed in (do not separate them).
- ♠ The back of pages will *not* be graded *unless* you so indicate on the front.