Name: **Student ID Number:**

Physics 8: Final Exam

June 10, 2005

Version A

- Be sure to write your name at the top of each page
- Multiple Choice problems are worth 1.5 points each for a total of 60 points
- True/False problems are worth 1.5 points each for a total of 15 points
- Short Answer problems total 25 points
- Show your reasoning, write formulas where appropriate (short answer)
- If you miss one part of the short answer, but need the number for the next part, make up a number and proceed

Formula List:

- $F = ma$
- weight = mg, with $g \approx 10$ m/s^2
- $P.E. = mgh$
- $K.E. = \frac{1}{2}mv^2$
- $W = F \cdot d$
- typical heat capacities range from about 1000–4000 J/kg/°C
- $P = \sigma T^4$; $\sigma = 5.67 \times 10^{-8}$ W/m^2/°K^4; T in Kelvin
- T(°K) = T(°C) + 273; T(°C) = $\frac{5}{9}$[T(°F)-32]
- $F_{\text{drag}} = 0.65 c_D A v^2$; A in m^2, v in m/s
- $\lambda f = c$; $c_{\text{sound}} = 345$ m/s, $c_{\text{light}} = 300,000,000$ m/s
- refractive index for air, water, corn syrup are 1.00, 1.33, 1.47, respectively
- $R = \left[\frac{n_1 - n_2}{n_1 + n_2}\right]^2$

Complex Units:

- Newtons: N = kg·m/s^2
- Joules: J = N·m = kg·m^2/s^2
- Watts: W = J/s = kg·m^2/s^3
- Volts: V = J/C
- Amperes: A = C/s