PHYS 101 Spring 2011 Study Guide for Final

The following equations will be given. Use them to understand concepts and to solve problems.

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|  | MOTION | |
| Translational | Rotational |
| Time interval | t | t |
| Displacement/Distance | d; (d = r·θ) | θ |
| Velocity | v = d/t; (v = r·ω) | ω = θ/t |
| Acceleration | a = Δv/t; (a = r·α) | α = Δω/t |
| Kinematic equations | Vf = vi + at | ωf = ωi + αt |
| vf2 = vi2 + 2ad | ωf2 = ωi2 + 2αθ |
| d = vit + ½ at2 | θ = ωit + ½ αt2 |
| d = ½(vf + vi)t | θ = ½(ωf + ωi)t |
| To create | force = F | torque = |
| Inertia | Mass =m | Rotational inertia =  I =m·r2 |
| Newton’s 2nd Law | Fnet = m·a | τnet = I·α |
| Momentum | **p** = m·v | **L** = I·ω |
| Conservation of momentum | Σmivi = Σmfvf | ΣIiωi = ΣIfωf |
| Kinetic Energy | K = ½·m·v2 | K = ½·I·ω2 |
| Work | W=F·d | W=τ·θ |
| Impulse | I=F·t F·t=∆p | I=τ·t τ·t=∆L |

Gravitational Potential Energy = u = m.g.h Weight = Mass·gravity  
Acceleration due to gravity on Earth = g = 9.8 m/s2  
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1. Unit conversion, using the given conversion factors.  
2. Solving problems with kinematic equations.  
2. Newton’s three laws of motion, and solving problems with Newton’s second law of motion.  
3. Temperature conversion.  
4. Momentum and Conservation of momentum.   
5. Defining and Calculating pressure.  
6. Drawing periodic waves and identifying Amplitude, Period, and Wavelength in the diagram.  
7. Ohm’s law, Electric power, and Estimating the cost of electricity.  
8. Transformer and its use in the transmission of electric power.  
9. Full page essay on Japan’s Nuclear Disaster.  
10. Study old-tests, T1, T2, and T3.