

Physics 105 Final Exam Review

36 Questions

15 HW style questions

21 conceptual questions

4 units roughly equally treated, slightly greater emphasis on unit 3 concepts

Constants needed:

- 1) speed of sound in air (343 m/s)
- 2) Reference intensity
- 3) Moment of inertia for sphere
- 4) Acceleration due to gravity ☺
- 5) Radians per revolution

Topics treated on the exam

1. Ideal gas law
2. Work done by a gas at constant pressure due to a volume change ($W=p*\Delta V$)
3. Kinematics
 - a. a la tortoise and hare problem
 - b. simple velocity, distance, time
 - c. Rotational kinematics
4. Intensity
 - a. Intensity level
 - b. Addition of Intensity Levels
 - c. Intensity as a function of distance
5. Conservation of mechanical energy
 - a. Spring potential
 - b. grav. potential
 - c. Translational KE
 - d. Rotational KE of a sphere (need moment of Inertia for sphere)
6. Frequency of simple harmonic oscillator
7. Conservation of momentum
 - a. Inelastic
 - b. Perfectly inelastic
 - c. Two-dimensional (conceptual)
 - d. Angular momentum
8. Pipe resonance

9. Newton's laws
 - a. Normal force in presence of acceleration (a la elevator problem)
 - b. Acceleration of multiple connected objects (think pulley problem)
 - c. Angular acceleration produced by a torque
10. Projectile motion
11. Beats
12. Doppler shift
13. Types of acceleration
 - a. Tangential
 - b. Centripetal
14. Bernoulli equation
15. Relative velocity
16. Independence of x-y motion
17. Volume flow rate
18. Static vs. kinetic friction
19. Torque
20. Pressure, continuity in enclosed fluids (Pascal's principle)
21. First law of thermodynamics
22. Second law of thermodynamics
23. Energy transfer (power) through conduction
24. Principles of heat transfer
25. Principles of conservation of energy (several covered during course)
26. Buoyancy