PHYSICS   NAME _____

2ND SEMESTER EXAM REVIEW

MAY 2013

THE FOLLOWING IS A LIST OF OBJECTIVES THAT YOU SHOULD HAVE ACCOMPLISHED THIS SEMESTER IN PHYSICS. YOU SHOULD ANSWER EACH ONE BEFORE YOU TAKE YOUR EXAM.

BONUS: YOU MAY RECEIVE ¼ POINT BONUS ON YOUR EXAM FOR UP TO 40 OBJECTIVES THAT ARE ANSWERED COMPLETELY AND CORRECTLY AND TURNED IN BY THE DAY OF YOUR EXAM. COMPLETE EACH OBJECTIVE ON A SEPARATE SHEET OF PAPER. USE ONE PAGE TO ANSWER EACH OBJECTIVE (even if it does not need that much room). DO NOT ANSWER MORE THAN ONE OBJECTIVE PER PAGE.

YOU MAY WORK ON THESE OBJECTIVES IN GROUPS THAT IF I PRE-ASSIGN THEM, HOWEVER, YOU MAY NOT COPY SOMEONE ELSE'S WORK.

1. State the impulse-momentum theorem and use it to calculate the force required to change an objects momentum –include the problem.

2. Use the impulse-momentum theorem to calculate stopping distance – include the problem.

3. Describe three different roles of time in changing an objects momentum. Give an example for each.

4. Describe the interaction between two objects in terms of the change in momentum of each object.

5. Calculate the final velocity of objects after an inelastic collision, given initial velocities *(or vice-versa)* – include the problem.

6. Describe the role of momentum in the effect of bouncing.

7. Use the law of conservation of energy with the law of conservation of momentum to solve problems – include the problem.

8. Find the tangential speed of a point on a rigid rotating object using the angular speed and the radius.

9. Solve problems with tangential acceleration.

10. Solve problems with centripetal acceleration.

11. Calculate the force that maintains circular motion.

12. Distinguish between centripetal and centrifugal forces

13. Use Newton's universal law of gravitation to calculate the gravitational force between two masses

14. Describe the methods used to measure G, the universal gravitation constant.

15. Explain why objects in free fall seem "weightless."

16. State the conditions for translations and rotational equilibrium

17. Distinguish between torque and force

18. Calculate the torque on an object ($T = \text{Fd}$)

19. Solve problems with rotational equilibrium ($T_c = T_{cc}$)

20. Identify the conditions of simple harmonic motion

21. Calculate the spring force using Hooke's law

22. Calculate the period and frequency of an object vibrating with simple harmonic motion.

23. Distinguish between longitudinal and transverse waves; between a wave pulse and a continuous wave.

24. Define amplitude, wavelength, frequency, and period, and velocity of waves.

25. Solve problems using the wavelength, frequency, and velocity of waves.

26. Relate energy and amplitude, and explain how this relates to tsunamis.

27. Define and differentiate among, reflection, refraction, and diffraction of waves.

28. State the principle of superposition and explain how constructive and destructive interference result.

29. Predict when a reflected wave will be inverted.

30. Explain how sound waves are produced

31. Relate frequency to pitch.

32. Compare the speed of sound in various media.

33. Describe the Doppler effect, and determine the direction of a frequency shift when there is relative motion between a source and an observer.

34. Calculate the intensity of sound waves.

35. Relate intensity, decibel level, and perceived hearing.

36. Explain why resonance occurs and give examples.

37. Use the properties of sound and resonance to explain how we hear.

38. Relate harmonics and timbre and explain why different instruments playing the same note have a different sound.

39. Relate the frequency difference between two waves to the number of beats heard per second.

40. Describe how the brightness of a light source is affected by distance.

41. Identify the primary colors of light and their complementary colors. Explain why they are complementary colors.

42. Explain the formation of color by addition of light. Give four examples.

43. Explain why objects that are red, blue, green, cyan, yellow, and magenta are those colors. Answer each separately.

44. Identify the primary colors of pigment and their complementary colors. Explain why they are complementary colors.

45. Explain the formation of color by subtraction by pigments or dyes. Give six examples.

46. Describe two methods by which light can be polarized, and explain how sunglasses work.