HON PHYSICS
1ST SEMESTER EXAM REVIEW

The following is a list of objectives that you should have accomplished this semester in Physics. You should be able to answer each one before you take your exam.

BONUS: YOU MAY RECEIVE 1/4 POINT BONUS ON YOUR EXAM FOR EACH OBJECTIVE THAT IS ANSWERED COMPLETELY AND CORRECTLY AND TURNED IN BY THE DAY OF YOUR EXAM. You are encouraged to answer all of the objectives to adequately study for the exam; however, a maximum of 40 OBJECTIVES will count for extra credit.

USE AT LEAST 1/2 OF A PAGE TO ANSWER EACH OBJECTIVE (leave that much space, even if it does not need that much room). Begin the next question either half way down the page or at the beginning of the next page. DO NOT ANSWER MORE THAN TWO OBJECTIVES PER PAGE. Write on the FRONT AND BACK of the page. Also, put your name and class period on the top right corner of each page.

YOU CANNOT COPY ANYONE ELSE'S ANSWERS **(NO ONE'S - NOT EVEN YOUR LAB PARTNER'S)**, WRITTEN OR ORAL, FOR ANY OBJECTIVE. If you have done so, or if you know of anyone who has done so, you are obligated to tell me immediately. Your honor is worth more than ten points extra credit!

1. Identify activities and fields that involve the major areas within physics.
2. Describe the steps of the scientific method and use them to solve a problem.
3. List the three basic SI units, the quantities they describe, and the current standard for each.
4. Use scientific notation to write numbers and make calculations.
5. Explain the difference between accuracy and precision and give an example of each.
6. Use significant figures properly in measurements and calculations. (5 examples)
7. Define and plot a graph of a direct proportionality.
8. Define and plot a graph of an inverse proportionality.
9. Calculate the displacement of an object traveling at a known velocity for a specific time interval – include the problem.
10. Describe the graphical representations of accelerated and non-accelerated motions on position-time graphs and velocity-time graphs.
11. Calculate the final velocity in the case of uniform acceleration ($v_f = v_i + at$) – include the problem
12. Use the kinematic equation $d = \frac{1}{2}(v_f + v_i)t$ in a calculation – include the problem.
13. Use the kinematic equation $d = v_i t + \frac{1}{2}at^2$ in a calculation – include the problem.
14. Use the kinematic equation $v_f^2 = v_i^2 + 2ad$ in a calculation – include the problem.
15. Calculate the displacement of a freely falling object – include the problem.
16. Calculate the final velocity of a freely falling object – include the problem.
17. Calculate the time for falling of a freely falling object – include the problem.
18. Compare the times for falling of different sized objects dropped at the same time and explain your answer.
19. Add multiple vectors using the graphical method of vector addition – include the problem.
20. Add multiple vectors using the component method of vector addition – include the problem.
21. Recognize examples of projectile motion and describe the path of a projectile both with and without air resistance.

22. Solve problems with projectiles launched horizontally – include the problem.

23. Calculate the maximum height and range of projectiles launched at an arbitrary angle if initial velocity and final velocity are given – include the problem.

24. Find the maximum height and range of projectiles launched at an arbitrary angle if initial velocity and angle are given – include the problem.

25. Solve problems involving relative velocity – include the problem.

26. Distinguish between contact forces and field forces and give examples of each.

27. Explain the relationship between the motion of an object and the net external force acting on it. Give an example of a net force and how it effects motion.

28. Resolve force vectors on an inclined plane and solve problems – include the problem

29. State Newton's three laws of motions and display an understanding of their applications.

30. Calculate the acceleration of an object if some net external force (at an angle or on an inclined plane) is acting on it – include the problem.

31. Explain the difference in mass and weight and describe how you could lose weight without losing mass.

32. Define free-fall and explain the effects of air resistance and terminal velocity

33. Demonstrate and understanding of the nature of frictional forces and be able to use the coefficient of friction in solving problems ($F_f = \mu F_N$) *(2 examples: one at an angle, one not at an angle)*

34. Identify where work is or is not being performed in a variety of situations. (4 examples)

35. Calculate net work done when many forces are applied to an object – include the problem.

36. Calculate work when the force is applied at an angle – include the problem.

37. Define and calculate the kinetic energy for an object – include the problem.

38. Define and calculate the gravitational potential energy for an object – include the problem.

39. Define and calculate the elastic potential energy for an object – include the problem.

40. Use the law of conservation of mechanical energy to solve problems – include the problem.

41. Solve problems using the work-energy theorem – include the problem.

42. Define power and calculate it in two different ways – include the problem.

43. Define and calculate the mechanical advantage of a simple machine – include the problem.

44. Distinguish between work output and work input, and calculate the efficiency of a machine.