HON PHYSICS NAME _____
2ND SEMESTER EXAM REVIEW
MAY 2023

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 A 0.2 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.

USE AT LEAST 1/2 OF A PAGE SPACE 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.

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 and calculate the torque on an object.
18. Use rotational equilibrium ($T_c = T_{cc}$) to calculate unknown forces(s) on an object.
19. Describe the properties of an ideal fluid.
20. Distinguish between laminar and turbulent flow and give examples of each.
21. Define Archimedes' principle as it relates to objects that are floating and objects that are under water.
22. Explain the relationship between buoyant force and the apparent weight of a submerged object.
23. Use known densities to calculate the buoyant force on an object that is submerged in a fluid.
24. Use actual weight and apparent weight to find the density of an unknown object.
25. Use Pascal's law to calculate force.
26. Calculate the absolute pressure on a fluid at a known depth.
27. Use the continuity equation to determine the speed of a fluid leaving a pipe with different diameters at the opening and exit.

28. Use the Bernoulli principle to explain airplane flight.
29. Define the Bernoulli principle and give two examples of it in everyday life – not including airplane flight.
30. Use the Bernoulli equation to calculate pressure or a change in pressure
31. Use the Bernoulli equation to calculate velocity.
32. Use the Bernoulli equation to calculate lift force.
33. Identify the conditions of simple harmonic motion
34. Calculate the spring force using Hooke's law
35. Calculate the period and frequency of an object vibrating with simple harmonic motion.
36. Distinguish between longitudinal and transverse waves; between a wave pulse and a continuous wave.
37. Define amplitude, wavelength, frequency, and period, and velocity of waves.
38. Solve problems using the wavelength, frequency, and velocity of waves.
39. Relate energy and amplitude, and explain how this relates to tsunamis.
40. Define and differentiate among, reflection, refraction, and diffraction of waves.
41. State the principle of superposition and explain how constructive and destructive interference result.
42. Explain how sound waves are produced
43. Compare the speed of sound in various media.
44. Describe the Doppler effect, and determine the direction of a frequency shift when there is relative motion between a source and an observer.
45. Calculate the intensity of sound waves.
46. Relate intensity, decibel level, and perceived hearing.
47. Explain why resonance occurs and give examples.
48. Use the properties of sound and resonance to explain how we hear.
49. Use harmonics and timbre to explain why different instruments playing the same note have a different sound.
50. Relate the frequency difference between two waves to the number of beats heard per second.