PHYS 211 F 2013 MWF 9:30-10:20 & 11-11:50  Study Guide for Test #1  Chapters 1-4

Test will consist of regular questions, derivations, and problems.

1. Units, Unit standards, and unit conversions. (Conversion factors will be provided)

2. Using trigonometric functions, Pythagorean Theorem, and Calculus to solve problems.

3. Defining and identifying the following physical quantities as vectors or scalars and expressing their units: Time, Position, Distance, Displacement, Speed, Velocity, and Acceleration.

4. Distinguishing instantaneous quantity from average quantity.

5. Equations of kinematics: (acceleration due to gravity = 9.8 m/s2, down)

Final velocity = *v*, Initial velocity = *v0*, Acceleration = *a*, Time interval = *t*, Displacement = *x-x0*

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a. Understanding and derivation of the above kinematics equations.

b. Solving motion problems using kinematics equations.

6. Analyze motions graphically:   
 a. Position (x) vs. Time (t) graph: Slope is the velocity.      
 b. Velocity (v) vs. Time (t) graph: Slope is the acceleration and Area = Displacement.   
 c. Acceleration (a) vs. Time (t) graph: Area = Change in velocity.

7. Obtaining velocity and acceleration from position by differentiation.

8. Obtaining velocity and position from acceleration by integration.

9. Vectors:   
 a. Find the components of a vector.  
 b. Find the sum/resultant of two or more vectors, including unit vector notation.  
 c. Determining the angle between two vectors using the vector dot/scalar product.   
 d. Determining the cross product of two vectors in unit vectors.

10. Understanding and solving projectile motion problems.   
  
11. Understanding and solving relative motion problems. http://edugen.wileyplus.com/edugen/courses/crs4957/halliday9118/halliday9118c04/image_n/nt0072-y.gif

12. Read the chapters thoroughly and critically to understand concepts presented.

13. Practice end of chapter questions and problems.