

Exam 1 Review Notes

Chapter 1

Category I

- Sec 1-3: Dimensional Analysis
 - Problems like:
 - #1, Practice Exam
 - Exercise 1-2
 - Prob. #5, HW
 - Prob. #7, HW
 - Prob. #9, HW

Category II

- Sec 1-4: Significant Figures
 - Problems like:
 - #2, Practice Exam
 - Prob. #13, HW
 - Prob. #14, HW
 - Prob. #15, HW
- Sec 1-5: Unit Conversions
 - Problems like:
 - #3, Practice Exam
 - Example 1-2
 - Prob. #20, HW
 - Prob. #24, HW
 - Prob. #30, HW

Category III

- Sec 1-1
- Sec 1-6
- Sec 1-7

Chapter 2

Category I

- One-Dimensional Motion with Constant Acceleration (Secs 2-5 and 2-6)... probably more than 1 question on this!
 - Problems like:
 - Example 2-5
 - Example 2-8
 - Example 2-9
 - #5, Practice Exam
 - #15, Practice Exam
 - Prob. #45, HW
 - Prob. #48, HW
 - Prob. #55, HW
- Free-fall (Sec 2-7)... At least 1 question on this
 - Problems like:
 - Example 2-10
 - Example 2-11
 - Prob. #63, HW
 - Prob. #64, HW
 - #7, Practice Exam
 - Could also be something *conceptual*, like:
 - #6, Practice Exam
 - CQ #17, HW

Key:

- **Category I:** most important stuff. Definitely on exam.
- **Category II:** less important, but still "fair game." *Could* be on exam.
- **Category III:** definitely *not* on exam.

Category II

- Graphical Interpretation of Average Velocity, Instantaneous Velocity, Average Acceleration, Instantaneous Acceleration (Secs 2-2, 2-3, 2-4)
 - Problems like:
 - #4, Practice Exam
 - Prob. #21, HW

Category III

- (empty... That is, you need to know *all* of Chapter 2!)

Chapter 3

Category I

- Properties of Vectors
 - adding vectors (graphically and by components)
 - the negative of a vector (graphically and by components)
 - subtracting vectors (graphically and by components)
 - multiplying a vector by a scalar (graphically and by components)
 - the component form of a vector
 - switching between the two equivalent representations of a vector (magnitude/direction and components)
 - Problems like:
 - #8, Practice Exam
 - Prob. #4, HW
 - Prob. #12, HW
 - Prob. #21, HW
 - Prob. #28, HW
 - Prob. #31, HW
 - Prob. #34, HW

Category II

- (empty... There's nothing that falls into this category.)

Category III

- Sec 3-5... except for the two items I mentioned to you in class:
 - The instantaneous velocity vector always points *tangent to the path, in the direction of motion*.
 - There is *some* acceleration (i.e., $\vec{a} \neq \vec{0}$) whenever the velocity vector is changing in *any way* (i.e., in *magnitude* or in *direction*.)
- Sec 3-6

Chapter 4

Category I

- Projectile Motion (i.e., the whole chapter)
 - Problems like:
 - #9, Practice Exam
 - Prob. #7, HW
 - Prob. #16, HW
 - Prob. #23, HW
 - Prob. #40, HW
 - Prob. #46, HW

Category II

- Something *conceptual*, like:
 - CQ #5, HW
 - CQ #13, HW

Category III

- (empty... There's nothing that falls into this category. You need to know *all* of Chapter 4!)

Chapter 5

Category I

- Applications of Newton's Second Law (Sec 5-3)... Definitely more than 1 question on this!!
 - Know how to draw a *complete, correct* free-body diagram (FBD)!
 - Know how to apply 2nd law to problems
 - Problems like:
 - Problem of block sliding down ramp (done in class)
 - #11, Practice Exam
 - Prob. #37, HW
 - Active Example 5-1
 - Example 5-5
 - Active Example 5-2
 - Example 5-8
 - Example 5-9
 - Prob. #1, HW
 - Prob. #19, HW
 - Prob. #26, HW

Category II

- Be able to *state* each of Newton's laws.... In *words* or in *symbols*. (Secs 5-2, 5-3, 5-4)
 - Questions like:
 - #10, Practice Exam
 - #14, Practice Exam
- Apparent Weight (5-6)
 - Problems like:
 - Example of person in elevator (done in class)
 - #12, Practice Exam
 - Prob. 35, HW
 - Example 5-7
- Problem or Conceptual Question on Newton's 3rd law (Sec 5-4)
 - Problems/Questions like:
 - #13, Practice Exam
 - CQ #8, HW
 - Prob. #15(a), HW

Category III

- Sec 5-1
- Sec 5-5... Except that you should know that when you have forces acting along directions that are not parallel to the x or y axes, you have to resolve all the forces into components and then use:
 - $\sum F_x = ma_x$ and
 - $\sum F_y = ma_y$
- Sec 5-7... Except that you should know that whenever two surfaces are in contact, there's a force (called the *normal force*) that each surface exerts on the other, and this force always acts in a direction that is perpendicular to the two surfaces in contact.