

PHYS 1211, Introductory Physics I, Final Exam, December 7 Thursday, 9am to noon, GYM

TOPICS: Focus on the following topics.

Part I

Chapter 2 and 4: Study 2D trajectory, i.e. object launch into the air with an initial velocity. This could include the case when a ball is thrown straight up or down.

Chapter 5 and 6: Newton's second and third law, friction, incline, pulley with no friction between rope and pulley.

These topics are covered mostly in midterm 2, and part of midterm 1.

Part II

Chapter 7: work and kinetic energy; work-energy theorem; work by gravity and elastic spring

Chapter 8: Conservative and non-conservative forces; gravitational and elastic potential energy; Conservation of Mechanical Energy $\Delta E_{mech} = \Delta U + \Delta K$;

Conservation of Energy $W_{ext} = \Delta E_{mech} + \Delta E_{th}$

Chapter 9: Impulse and Momentum; Impulse-Momentum Theorem; Conservation of Momentum; center of mass (COM); Newton's law for system.

Part III

Chapter 10: Rotational variables, θ, ω, α . Rotational kinematics equations for constant α . $\vec{\omega}$ and $\vec{\alpha}$ as vectors using right hand rule (see Figure 10-6). Rotational kinetic energy and moment of inertia; Torque, τ , moment arm r_{\perp} , and Newton's second law for rotation; pulley system rotating without slipping.

Chapter 11: Rolling without slipping; problems with torque and force on rolling objects; problems with conservation of energy of rolling object.

Part I, II and III will be equally represented in the final exam.

Format of Final Exam

Section 1

12 multiple choice, 2.5 points each for a total of 30 points

8 full answer questions at 10 points each for a total of 80 points

Total Points 110.