Exam I

1. Physics and Measurement

1.1 Standards of Length, Mass, and Time
1.2 Modeling and Alternative Representations
1.3 ~~Dimensional Analysis~~ [Helpful tool, but no homework or exam questions on this topic]
1.4 Conversion of Units
1.5 ~~Estimates and Order-of-Magnitude Calculations~~
1.6 ~~Significant Figures~~ [Helpful idea, but no homework or exam questions on this topic]

2. Motion in One Dimension

2.1 Position, Velocity, and Speed of a Particle
2.2 Instantaneous Velocity and Speed
2.3 Analysis Model: Particle Under Constant Velocity
2.4 The Analysis Model Approach to Problem Solving
2.5 Acceleration
2.6 Motion Diagrams
2.7 Analysis Model: Particle Under Constant Acceleration
2.8 Freely Falling Objects
2.9 Kinematic Equations Derived from Calculus

3. Vectors

3.1 Coordinate Systems
3.2 Vector and Scalar Quantities
3.3 Basic Vector Arithmetic
3.4 Components of a Vector and Unit Vectors

4. Motion in Two Dimensions

4.1 The Position, Velocity, and Acceleration Vectors
4.2 Two-Dimensional Motion with Constant Acceleration
4.3 Projectile Motion
4.4 Analysis Model: Particle in Uniform Circular Motion
4.5 Tangential and Radial Acceleration
4.6 ~~Relative Velocity and Relative Acceleration~~

5. The Laws of Motion

5.1 The Concept of Force
5.2 Newton's First Law and Inertial Frames
5.3 Mass
5.4 Newton's Second Law
5.5 The Gravitational Force and Weight
5.6 Newton's Third Law
5.7 Analysis Models Using Newton's Second Law
5.8 Forces of Friction