**Unit Test Kinematic Study Guide – Chapter2-4**

**Chapter 2**

Main Concept: Students should understand the general relationships among positions, velocity and acceleration for motion of a particle along a straight line. Sections 2-1 to 2-4

Objective 1: Given a graph of one of the kinematic quantities, position, velocity or acceleration as a function of time, they can recognize in what time intervals the other two are positive, negative or zero and can identify or sketch a graph of each as a function of time.

Main Concept: Students should understand the special case of motion with constant acceleration. Section 2.5 to Section 2.7

Objective 2: Write down expressions for velocity and position as a function of time and identify or sketch graphs of these quantities.

Objective 3: Use the equation v= v0 + at, x = x0 + v0t + 1/2 at2  and v2 = v02 + 2a(x-x0) to solve problems involving one-dimensional motion with constant acceleration.

**Be able to understand Example 2-9; Example 2-12**

**Chapter 3**

Main Concept: Students should be able to add, subtract and resolve displacement and velocity vectors.

Objective 1: Determine components of a vector along two specified, mutually perpendicular axes. Sec. 3.1-3.2

Objective 2: Determine the net displacement of a particle or the location of a particle relative to another. Sec. 3.3-3.4

Objective 3: Determine the change in velocity of a particle or the velocity of one particle relative to another. Sec. 3.6

**Be able to understand Active Example 3-1**

**Chapter 4**

Main Concept: Students should understand the motion of projectiles in a uniform gravitational field.

Objective 1: Write down expressions for the horizontal and vertical components of velocity and position as functions of time, and sketch or identify graphs of these components. Sec. 4.1-4.3

Objective 2: Use these expressions in analyzing the motion of a projectile that is projected with an arbitrary initial velocity. Sec. 4.4-4.5

**Be able to understand Conceptual Checkpoint 4-3; Examples 4-5; Active Example 4-1**