**Part 1 - Kinetic Energy**

1. A dynamics cart has a kinetic energy of 4.2 J when moving across a floor at 5.0 m/s. What is the mass of the cart?
2. A 150 g bird goes into a dive, reaching a kinetic energy of 30.0 J. What is the speed of the bird?
3. A 1300 Kg car starts from rest at a stoplight and accelerates to a speed of 14 m/s over a displacement of 82 m.
   1. What is the net work done on the car?
   2. What is the net force acting on the car?
4. How much work is required to slow down a 1200 Kg car from an initial speed of 20 m/s to a final speed of 10 m/s?
5. In which of the following situations does the kinetic energy increase more? (Explain your answer):   
   a) A 100 kg bicycle accelerates from 0 m/s to 1 m/s or b) The same bicycle accelerates from 10 m/s to 11 m/s.

**Part 2 - Gravitational Potential Energy**

1. A 48 Kg student loses 52000 J of energy falling from the top to the bottom of the Drop Zone ride at Wonderland. How high is the ride?
2. A person with a mass of 42 Kg gains 4900 J of gravitational potential energy climbing the stairs from the first floor to the second floor of a building. If the first floor is 20 m above the ground, how high is the second floor?
3. How much work is done by a crane to raise a 800 Kg load of bricks from a height of 20 m to a height of 50 m?
4. How much energy is released when a 3.0 Kg rock falls from a height of 30.0 m to a height of 10.0 m? What happens to the energy that is released?

**Answers:**

1) 0.34 Kg, 2) 20 m/s, 3a) 130 KJ, 3b) 1.6x103 N, 4) - 1.8x105 J, 5) b

6) 110m, 7) 32 m, 8) 2.4x105 J, 9) 590 J is converted to kinetic energy of the rock