PHY 101 **Quizzam 1** **June 10, 2021**

Name: _____

Please show your work when requested, no credit will be given if there is no work. Partial credit will be given where warranted, so show me your physics reasoning. Do not forget to give units for numeric answers and use appropriate significant figures.

This quizzam is open notes and open book but not open internet, i.e. do not google the problems for solutions.You have 45 minutes to complete this quizzam. Good luck!

1. (2 points) Give an example of a situation in which there are clear distinctions between distance traveled, displacement, and magnitude of displacement. Be sure to identify each of these quantities in your example.

2. (1 point) Which of the physical quantities we talked about does a car's odometer measure? What about the speedometer?

3. (1 point) A rock is thrown straight up. What is its acceleration at the highest point of its flight?

4. (2 points) A rectangular box has side lengths measured as 1.03 m ± 0.02 m, 2.47 m ± 0.04 m, and 10.3 m ± 0.24 m. What is the volume of this box and the uncertainty of this value?

5. (6 points) Freight trains can produce only relatively small accelerations and decelerations.
   a. What is the final velocity of a freight train that accelerates at a rate of 0.0500 m/s^2 for 8.00 min, starting with an initial velocity of 4.00 m/s?

   b. If the train can slow down at a rate of 0.550 m/s^2, how long will it take to come to a stop from this velocity?

   c. How far will it travel in each case?

6. BONUS: (4 extra points) A coin is dropped from a hot-air balloon that is 300 m above the ground and rising at 10.0 m/s upward. For the coin, find
    a. the maximum height reached, and

    b. the time before it hits the ground.