**MIDTERM EXAM PHYSICAL SCIENCE**

1. How many centimeters long is the proverbial “10-foot pole?” (5pts)

1. A piece of metal has a mass of 85 cg and a volume of 450L. What is its density in g/cm3? What would be the mass of 300 cm3 of this metal? What would be the volume of 200 ounces of this metal? (15pts)

1. A flower pot is dropped out of the window of a very tall building. How fast will it be moving after 7 seconds? How much is the acceleration 3 seconds after it falls? (10pts)

1. FM–95, an FM radio station, broadcasts at a frequency of 95.1 MHz. What is the wavelength of these radio waves in meters? (5pts)

1. You are riding in a car traveling at a speed of 73 mi/hr in a 60 mi/hr zone when suddenly you spot a police car parked 20 feet ahead of you. You hit the brakes and slow down with an acceleration of -2 ft/sec2, for a total time of 3 seconds. Do you get a ticket? (15pts)

1. When the following equation is balanced, the coefficients are \_\_\_\_\_\_\_\_\_\_.

C₈H₁₈ + O₂ → CO₂ + H₂O? (5pts)

1. A satellite that is 4175 miles from the center of the earth, orbits with a period of 90 minutes. What is its centripetal acceleration? (10pts)

1. Use the scientific method to investigate a simple problem/question of your choice. The steps are listed in the lecture notes. (5pts)
2. How many of the following represents a chemical change? (10pts)

* Heating water on the stove until it boils
* Vinegar reacting with baking soda and producing a bubbly gas
* Burning toast in a toaster
* Breaking a piece of glass into small pieces
* Heating up a cup of tea

1. You fire a bullet from a height of 50m with a horizontal velocity of 50 m/s to the right. At the same instant you drop the same kind of bullet from a height of 50m. Which bullet will hit the ground first? Ignore air resistance. Explain your answer. (5pts)
2. A statement about mass always being conserved in a chemical reaction is an example of a \_\_\_\_\_. (5pts)
3. Thomson likened his atomic model to plum pudding because (5pts).
4. Use the speed vs. time graph **below** to explain the motion of the bus in each of the segments. (5pts)

