c) 65 miles/hour

Name: Chapter 1 Score:_ For full credit, make your work clear to the grader. Show the formulas you use, all the essential steps, and results with correct units and correct number of significant figures. Partial credit is available if your work is clear. Point values are given in parenthesis. Exact conversions: 1 inch = 2.54 cm, 1 ft = 12 in., 1 mile = 5280 ft. Prefixes: $p=10^{-12}$, $n=10^{-9}$, $\mu = 10^{-6}$, $m=10^{-3}$, $c=10^{-2}$, $k=10^{3}$, $M=10^{6}$, $G=10^{9}$, $T=10^{12}$. 1. (2) **T F** A scientific theory can be proved correct by using experiments. 2. (2) **T F** A scientific theory is based on experiments and observations. 3. (2) **T F** A scientific theory is changed when observations do not match predictions. 4. (2) T F The Système International (SI) of units is based on meters, grams, and seconds. 5. (8) Melissa claims her height is 175 cm \pm 0.5 cm. a) (2) How large is the *uncertainty* in the measurement of her height? b) (2) How large is the percent uncertainty in her height measurement? c) (2) If she had just said that her height is 175 cm, what is the implied uncertainty in her height? d) (2) How much is 175 cm in feet and inches (like 5 feet, 2 inches)? 6. (6) Below each given number, write the same value in "powers of ten notation" (i.e., like 4.5×10^5 , starting with a nonzero digit followed by a decimal point), preserving the number of significant figures. c) 0.0002030 a) 456.0 b) 220 7. (6) Give these in scientific notation, with SI base units (m, kg, s, without other prefixes). a) 4500 km b) 2.33 ps c) 2500 mg 8. (6) Convert to SI units, using any convenient prefix like μ , m, c, k, M, G, etc. Show how you did it, displaying all the needed conversion factors that you used, with their units. a) 1.00 day b) 300.0 feet

9.	(6)	Give t	the r	esults	of the	following	calcula	tions in	n standa	d SI	units	(m,	kg, s	etc.,	without	prefixes,	but
w	ith j	powers	of te	en nota	ation if	f needed),	to the	correct	number	of si	gnifica	nt fi	gures				

- a) $(3.0 \times 10^5 \text{ km/s}) \times (5.0 \text{ ns}) =$
- b) $(9.80 \text{ m/s}^2) \times (2.70 \text{ s}) =$
- c) $(19300 \text{ kg/m}^3) \times (1.00 \text{ cm})^3 =$
- 10. (5) Make an estimate of the number of times you will breathe in during 1.0 hour of strenuous excercise.

11. (5) Estimate how long it would take for you to cross Kansas going east-west by foot, walking continuously without stopping to rest. (Do not include the time for sleeping!)