chapters 1-2 Practice test B

KEY and

2.754×10^5

1. The number 275 362 correctly rounded off to four significant figures is (a) 2754, (b) 2.754×10^5, (c) 28 000, (d) 275 362.0, (e) 2.7536×10^5.

2. Which was used to determine the charge of the electron? charge / mass
   (A) the gold foil experiment
   (B) deflection of cathode rays by electric and magnetic fields
   (C) the oil drop experiment
   (D) the periodic table
   (E) the mass spectrometer

3. Which of the following is NOT a base metric unit?
   (A) meter
   (B) liter — $l \times w \times h$
   (C) mole
   (D) second
   (E) kilogram

3.9×10^2 g

4. The density of ice is 0.917 g/cm³. If a cubic block of ice is 75 mm on each side, which of the following is its mass?
   (a) 3.9×10^5 g
   (b) 4.2×10^2 g
   (c) 4.6×10^2 g
   (d) 3.9×10^2 g
   (e) 52 g

$(75\text{mm})^3$

$4.218 \times 10^5 \text{mm}^3 \times \frac{1\text{cm}^3}{1000\text{mm}^3} \times \frac{0.917\text{g}}{\text{cm}^3}$

5. Manganese forms several oxides, the most important of which is MnO_2. Everybody calls MnO_2 "manganese dioxide." Which one of the following names is preferred on the basis of the rules described in the text and presented during lecture? (Some of the names given are just wrong, others don't conform to the rules we developed.)

   A. manganous oxide
   B. manganic oxide
   C. manganese(I) oxide
   D. manganese(II) oxide
   E. manganese(IV) oxide

$Mn\ O_2$

$4+ \quad 2O^{2-}$

6. Among the names given to various compounds of arsenic (As) are those given below. Only one corresponds to the rules we developed for binary compounds of nonmetals. Which one?

A.	As_2O_3	Arsenic sesquioxide
B.	As_2O_3	Arsenous acid
C.	As_2O_5	Arsenic pentoxide
D.	As_2S_2	Arsenic disulfide
E.	As_2S_5	Diarsenic pentasulfide

7. Which statement best describes mass spectrometry?

A. The elemental composition of a molecule is determined by weighing the substances formed on combustion.

B. Molecular weights are determined with the aid of a device that counts and collects Avogadro's number of the molecules of interest and weighs them.

C. Neutral species (atoms or molecules) are ionized, the ions pass through a magnetic field and are separated according to their charge-to-mass ratio.

D. The rates at which substances fall through a liquid are measured and provide an estimate of their molecular weight.

E. When the nucleus of an atom decays, mass is converted to energy and this energy is measured.

8. Gallium is a metal best known for the fact that its melting point (30 °C) is only slightly above room temperature. Its atomic weight is 69.723. Given the additional information that gallium occurs naturally as a mixture of two isotopes and that the exact mass of the major isotope (60.4%) is 68.9257, calculate the exact mass of the minor gallium isotope.

A. 69.80 B. 69.91 C. 69.95 D. 70.50 E. 70.94

$69.723 = (68.9257)(0.604) + (0.396)(\quad) = 70.939$

9. Which set corresponds to Ag^+?

	Number of protons in nucleus	Number of neutrons	Number of electrons
A.	46	60	47
B.	47	62	46
C.	47	60	47
D.	48	62	47
E.	48	60	48

10. Perchloric acid has the formula $HClO_4$. What is the formula for radium perchlorate?

A. $RaClO_4$
B. Ra_2ClO_4
C. Ra_3ClO_4
D. $Ra(ClO_4)_2$
E. $Ra(ClO_4)_3$

11. Which is an alkaline earth metal?

A. Cu B. Fe C. K D. Sn E. Sr