Exam Chapter 1-2 Exam D

Name 9/21/16

KE-1

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Which one of the following is a pure substance? 1) _____
A) salt water
B) milk
C) concrete
D) elemental copper
E) wood

2) Which states of matter are significantly compressible? 2) _____
A) solids only
B) gases only
C) solids and liquids
D) liquids only
E) liquids and gases

$10^9 \text{ nm} \times 10^9 \text{ nm} \times 10^9 \text{ nm} = 10^{27} \text{ m}^3$

3) If matter is uniform throughout and cannot be separated into other substances by physical means, it is _____. 3) _____
A) a compound
B) an element
C) a homogeneous mixture
D) either an element or a compound
E) a heterogeneous mixture

$\frac{2.03\times10^{25}\text{ ng}}{1\text{ m}^3} \times \frac{9}{10^9\text{ ng}} \times \frac{10^{27}\text{ nm}^3}{1\text{ m}^3}$

4) Which one of the following is not an intensive property? 4) _____
A) temperature
B) melting point
C) density
D) boiling point
E) mass

$\frac{1\text{ m}^3}{1000\text{ dm}^3} \times \frac{1\text{ dm}^3}{1000\text{ cm}^3}$

$\frac{7.93\times10^{-1}\text{ ng}}{3.91\times10^{-24}\text{ nm}^3} = 2.03\times10^{25}\frac{\text{ng}}{\text{nm}^3}$

5) Of the objects below, _____ is the most dense. 5) _____
A) an object with a volume of 13 dm^3 and a mass of 1.29×10^3 g
B) an object with a volume of 139 mL and a mass of 93 g
C) an object with a volume of 0.00212 m^3 and a mass of 4.22×10^4 mg
D) an object with a volume of 2.5 L and a mass of 12.5 kg
E) an object with a volume of 3.91×10^{-24} nm^3 and a mass of 7.93×10^{-1} ng

$= 2.03\times10^{35}\frac{\text{g}}{\text{cm}^3}$

6) Expressing a number in scientific notation _____. 6) _____
A) removes ambiguity as to the significant figures
B) removes significant zeros
C) allows to increase the number's precision
D) changes its value
E) all of the above

7) Round the number 3456.5 to two significant figures. 7) _____

3.5×10^3

8) A certain liquid has a density of 2.67 g/cm3. 1340 g of this liquid would occupy a volume of _____ L. 8) _____

A) 50.2
B) 0.502
C) 35.8
D) 1.99×10^{-3}
E) 3.58

$1340\text{g} \times \frac{1\text{cm}^3}{2.67\text{g}} \times \frac{1\text{L}}{1000\text{cm}^3} = 0.50187$

9) 45 m/s = _____ km/hr 9) _____

A) 2.7×10^3 B) 1.6×10^2 C) 0.045 D) 2.7 E) 1.6×10^5

$\frac{45\text{m}}{\text{s}} \times \frac{1\text{km}}{1000\text{m}} \times \frac{60\text{s}}{1\text{min}} \times \frac{60\text{min}}{1\text{hr}} = 1.6 \times 10^2 \frac{\text{km}}{\text{hr}}$

10) The correct answer (reported to the proper number of significant figures) to the following is _____. 10) _____

12.75 x 1.3621 = ____

A) 17.4 B) 17.367 C) 17.40 D) 17.37 E) 17.0

11) The correct result (indicating the proper number of significant figures) of the following addition is _____. 11) _____

12
1.2
0.012
+ 0.012

13.332

A) 13
B) 13.3
C) 13.33
D) 13.332
E) none of the above

12) Which one of the following is not one of the postulates of Dalton's atomic theory? 12) _____

A) Atoms of an element are not changed into different types of atoms by chemical reactions: atoms are neither created nor destroyed in chemical reactions.
B) Atoms are composed of protons, neutrons, and electrons.
C) All atoms of a given element are identical; the atoms of different elements are different and have different properties.
D) Each element is composed of extremely small particles called atoms.
E) Compounds are formed when atoms of more than one element combine; a given compound always has the same relative number and kind of atoms.

13) The gold foil experiment performed in Rutherford's lab _____. 13) _____

A) led to the discovery of the atomic nucleus
B) confirmed the plum-pudding model of the atom
C) utilized the deflection of beta particles by gold foil
D) was the basis for Thomson's model of the atom
E) proved the law of multiple proportions

14) Cathode rays are _____. 14) _____

A) x-rays B) protons C) neutrons D) atoms E) electrons

15) Which combination of protons, neutrons, and electrons is correct for the isotope of copper, 15) _____

$^{63}_{29}Cu$?

63 − 29 = 34 N

A) 34 p^+, 29 n°, 34 e^-
B) 29 p^+, 34 n°, 29 e^-
C) 34 p^+, 34 n°, 29 e^-
D) 29 p^+, 29 n°, 63 e^-
E) 63 p^+, 29 n°, 63 e^-

16) Which pair of atoms constitutes a pair of isotopes of the same element? 16) _____

A) $^{14}_{6}X$ $^{12}_{6}X$

B) $^{20}_{10}X$ $^{21}_{11}X$

C) $^{19}_{10}X$ $^{19}_{9}X$

D) $^{17}_{9}X$ $^{17}_{8}X$

E) $^{14}_{6}X$ $^{14}_{7}X$

17) The element X has three naturally occurring isotopes. The isotopic masses (amu) and % abundances of the isotopes are given in the table below. The average atomic mass of the element is _____ amu. 17) _____

(0.1961)(52.62) + (0.5391)(56.29) + (0.2648)(58.31)

Isotope	Abundance	Mass
^{53}X	19.61	52.62
^{56}X	53.91	56.29
^{58}X	26.48	58.31

A) 57.23 B) 33.33 C) 55.74 D) 56.11 E) 56.29

18) Which pair of elements below should be the most similar in chemical properties? 18) _____

A) Cs and He
B) I and Br
C) K and Kr
D) B and As
E) C and O

19) Which one of the following does not occur as diatomic molecules in elemental form? 19) _____

A) sulfur
B) bromine
C) nitrogen
D) oxygen
E) hydrogen

18 e⁻

20) A molecular formula always indicates _____. 20) _____

A) how many of each atom are in a molecule
B) the isotope of each element in a compound
C) which atoms are attached to which in a molecule
D) the geometry of a molecule
E) the simplest whole-number ratio of different atoms in a compound

15 P 3⁻

21) Of the following, _____ contains the greatest number of electrons. 21) _____

A) P B) P^{2-} C) P^{2+} D) P^{3-} E) P^{3+}

22) Which of the following compounds would you expect to be ionic? 22) _____

A) H_2O_2 B) NH_3 C) H_2O D) SF_6 E) CaO

23) Which species below is the nitride ion? 23) _____

A) NO_3^- B) N^{3-} C) Na^+ D) NO_2^- E) NH_4^+

24) The charge on the copper ion in the salt CuO is _____. 24) _____

A) +2 B) +3 C) -2 D) -1 E) +1

25) Which formula/name pair is incorrect? 25) _____

A) $FeSO_4$ iron(II) sulfate
B) $FeSO_3$ iron(II) sulfite
C) FeS iron(II) sulfide
D) $Fe_2(SO_3)_3$ iron(III) sulfite
E) $Fe_2(SO_4)_3$ iron(III) sulfide

26) In the periodic table, the rows are called _____ and the columns are called _____. 26) _____

A) staffs, families
B) rows, groups
C) cogeners, families
D) periods, groups
E) octaves, groups

27) The correct name for CCl_4 is _____. 27) _____

A) carbon chloride
B) carbon perchlorate
C) carbon chlorate
D) carbon tetrachlorate
E) carbon tetrachloride

28) The correct name for H_2CO_3 is _____. 28) _____

A) carbohydrate
B) carbonous acid
C) carbohydric acid
D) hydrocarbonate
E) carbonic acid

29. Round the answers to each of the following problems to the correct number of significant figures

15.35 + 2.1 17.5

2.1
17.45

30. Using the periodic table to guild you, predict the chemical formula and name of the compound formed by the following elements,

Ca and O CaO

31. Write the formulas of the following compounds

copper (I) nitrate $CuNO_3$