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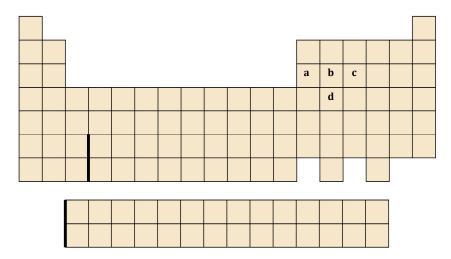
Spring 2010

Dr. Greg Sanchez

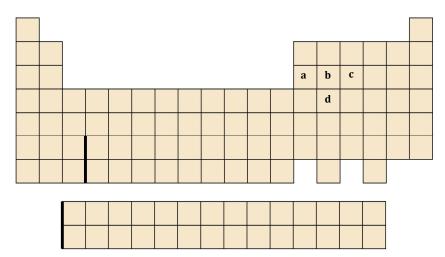
Exam 1 (100 Points)

Instructions: You have 1 hour and 20 minutes to complete this exam. For ALL calculations **SHOW YOUR WORK**. Significant figures are required for full credit. You may use the attached periodic table as your reference. Only use the recommended calculator per the syllabus. **There is zero tolerance for cheating.**

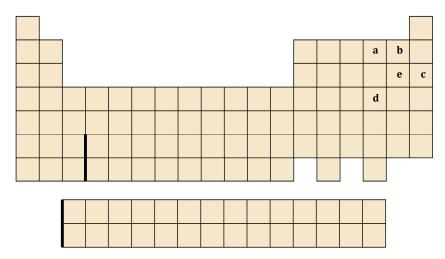
1) Which element indicated by the letter in the following periodic table is the best conductor of electricity and heat?



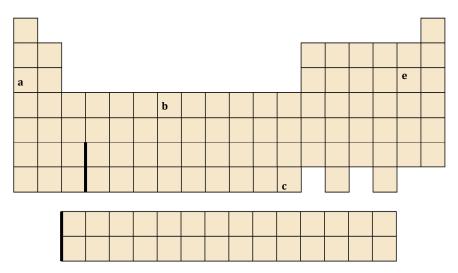
2) Which element indicated by the letter in the following periodic table is the poorest conductor of electricity and heat?



3) Which element is most chemically similar to the element indicated by the letter E in the following periodic table?



4) Which element indicated by the letter in the following periodic table reacts rapidly with water to form an alkaline solution?



5) You are visiting the planet Lagmom. The money exchange rates are shown below. How many Lagmom fizzbarts will you receive in exchange for \$500 at the Lagmom Spaceport Currency Exchange counter?

1.00 = 10 razz

5 pobs = 1 fizzbart

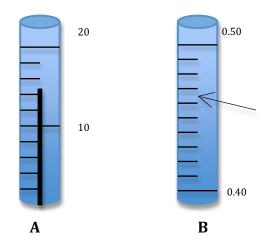
 $1 anta = 2 ext{ morbs}$

1 morb = 25 pobs

5 razz = 1 tanta

6) Evaluate the cylinders

- a) Which cylinder will provide the most precise measured value? _____
- b) Using the correct number of significant figures, what is the reading of cylinder A? _____
- c) Using the correct number of significant figures, what is the reading of cylinder B?



- 7) Which of the following atoms must exist as a diatomic molecule?
 - a) Pb
 - b) P
 - c) C
 - d)O
- 8) Draw a line to the value that best describes the prefix.

Micro-

Giga-

Centi- 0.000001

Kilo- 1,000,000,000

Milli-

9) True/False

An exact number has a degree of uncertainty.

10) Convert 15 m ³ to liters	
a) $1.5 \times 10^{-2} L$	
b) 1.5 L	
c) $1.5 \times 10^2 \mathrm{L}$	
d) $1.5 \times 10^4 L$	
	50 lbs. If the density of gold is 19.31 g/cm^3 , and the length and width of the cm respectively, what is the height of the ingot? (453.6 g = 1.00 lb)
12) How many significant	figures are in each of the following measure numbers?
a) 0.032	
b) 1.1101	
c) 50.0	
d) 766010	
13) Write the following in cut off):	scientific notation (the underlined digit represents the significant figure
a) 0.00300 <u>2</u>	
b) 94 <u>5</u> 60.0234	
14) True/False	
An isotope is an ato	om that has the same number of protons and neutrons, but a different

number of electrons.

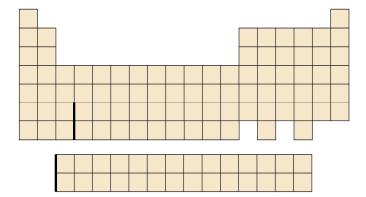
calculate the percent of salt in her sample.
Weight of evaporating dish: 42.09 g
Weight of evaporating dish and sample: 51.46 g
Weight of evaporating dish and sand after drying: 47.86 g
16) Identify the chemical symbol of element X in ^{80}X
17) Boron-9 can be represented as
a) ${}_{5}^{9}Be$
b) ${}_{5}^{9}B$
c) ${}^{14}_{5}B$
d) ${}^{14}_{9}B$
18) How many protons (p), neutrons (n), and electrons (e) are in one atom of $^{23}_{12}Mg$
p =
19) Provide the electron configuration or the element, where applicable, for the following. <u>Do no use a Noble gas core for this question:</u>
a) Pb ²⁺
b) S
2 4 22 22 62 22 64 22 11
c) $1s^22s^22p^63s^23p^64s^23d^1$
d) [He] 2s ² 2p ³

15) A student does experiment #4 (salt/sand) just like you. Using the student's data below,

- 20) What noble-gas element has the same number of electrons as each of the following ions?
 - a) S²⁻
 - b) Cs+
- 21) In lab #14, which anion(s) formed precipitates when silver nitrate solution was added?
- 22) How many total electrons can be found in a shell 3 (n = 3)?
- 23) How many electrons can be placed in one orbital?
- 24) True/False

Orbitals do not exist as three-dimensional structures.

- 25) What are three common characteristics of the valence shell.
- 26) Using the periodic table below, shade in the f orbital region.



27) What is the symbol for an atom having 15 protons and 18 electrons?
28) How many electrons are in ⁴⁵ Sc ³⁺
29) The nucleus of F-19 contains
30) A hypothetical element, Hy, has three isotopes, Hy-299, Hy-300, and Hy-301, which have the following natural abundance: 5.00% (Hy-299), 65.00% (Hy-300), and 30.00% (Hy-301). The atomic masses of the isotopes are 299.0 amu. 300.0 amu, and 301.0 amu, respectively. Calculate the atomic mass of Hy.
31) How many minutes will it take to drive to Los Angeles from San Francisco if an average speed of 72 mi/hr is maintained? The distance between the two cities is 405 miles.
32) What is the name of this class?