Chemistry Fall 2016 Semester Final Exam REVIEW

MATCHING: LAB EQUIPMENT FUNCTIONS

Identify the piece of lab equipment that corresponds with each description below. Not all of the answer choices will be used! No answer choice will be used more than once.

- a. Bunsen Burner
- b. Electronic Balance
- c. Evaporating Dish
- d. Hot Plate

- e. Mortar and pestle
- f. Scoopula
- g. Triple Beam Balance
- h. Watch Glass
- 1. Used to grind up a solid chemical into a powder.
- 2. Used to measure mass of a solid chemical without using electricity.
- 3. Used to cover beakers while heating.
- 4. Used to heat a beaker without using any gas.

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- 5. LAB SAFETY
 - The following footwear is the best in the laboratory:
 - a. sandals. c. closed toed shoes.
 - b. open toed shoes. d. shoes appropriate for the weather.
- _____6. You are heating a piece of glass and now want to pick it up. You should
 - a. use a rag or paper towels. c. use tongs.
 - b. pick up the end that looks cooler. d. pour cold water on it.
- _____ 7. Approved eye protections (such as goggles) are worn in the laboratory
 - a. to avoid eye strain.
 - b. to improve your vision.
 - c. only if you don't have corrective glasses.
 - d. any time chemicals, heat or glassware are used.
 - 8. You are heating a substance in a test tube. Always point the open end of the tube
 - a. toward yourself. c. toward another classmate.
 - b. toward your lab partner. d. away from all people.
 - 9. Flammable materials, like alcohol, should never be dispensed or used near
 - a. an open door. c. another student.
 - b. an open flame. d. a sink.
 - _ 10. Horseplay or practical jokes in the laboratory are
 - a. always against the rules.
- c. not dangerous.

b. okay.

d. okay if you are working alone.

- 11. Personal eyeglasses provide as much protection as
 - a. a face shield.
 - b. safety glasses.

- c. splash proof chemical goggles.
- d. none of the above.

12. SCIENTIFIC PROCESSES

A researcher is studying the effects of climate on freshwater life. She sets up an experiment where she will count the number of microscopic organisms that survive at a given temperature. In this experimental investigation, what is the independent variable?

- a. Amount of freshwater c. Number of organisms that survive
- b. Temperature

- d. none of the above
- 13. A researcher is studying the effects of climate on freshwater life. She sets up an experiment where she will count the number of microscopic organisms that survive at a given temperature. In this experimental investigation, what is the **dependent** variable?
 - a. Amount of freshwater
- c. Number of organisms that survive d. none of the above
- b. Temperature
- 14. Which of the following observations is qualitative?
 - a. The liquid has a density of 2.17 g/mL
 - b. The liquid boils at 100°C. d. The volume of the liquid is 26mL.
- 15. Which of the following statements is an observation?
 - a. It was raining while Henry Jenkins was at the movies.
 - b. Henry Jenkins liked the movie he watched at the theater.
 - c. Henry Jenkins leaves the movie theater and sees that the ground is wet.
 - d. The sprinklers flooded the street while Henry Jenkins was at the movies.
 - 16. Which of the following observations is quantitative?
 - a. The liquid has a density of 2.17 g/mL.
 - b. The liquid turns the blue litmus paper red.
 - c. The liquid tastes bitter.
 - d. The liquid is cloudy.
- 17. What is an inference?
 - a. A hypothesis

- c. An observation.
- b. A description using 5 senses

18. SIGNIFICANT FIGURES AND SCIENTIFIC NOTATION

The number of significant figures in the measurement 0.000305 kg is

- a. 3. c. 5.
- b. 4. d. 6.
- 19. The number of significant figures in the measurement 0.00320 g is
 - a. 2. c. 5.
 - b. 3. d. 6.
 - 20. The number of significant figures in the measurement 170.040 km is
 - a. 3.
 - b. 4.
- c. 5.
 - d. 6.

- d. A type of conclusion.

c. The liquid tastes bitter.

21.	The number	that has b	been e	expressed	to three	significant	figures	is
							<u> </u>	

- a. 0.052 g. c. 3.065 g.
- b. 0.202 q. d. 5000 g.
- 22. The distance between Henry Jenkins' house and the country of Djibouti is 386000 km. How would you write this distance in scientific notation?
 - a. 386×10^3 km c. 38.6 x 10⁴ km b. 3.86×10^{-5} km d. 3.86×10^5 km
 - 23. Convert 0.00083 into scientific notation. c. 83 x 10⁻⁵ a. 8.3 x 10⁻⁴ b. 8.3×10^4 d. 83×10^3
- 24. Convert 5.9 x 10^3 into standard notation. a. 59,000 c. 590 b. 0.0059 d. 5,900

25. Convert 3.02 x 10^{-5} into standard notation. a. 302,000 c. 30,200,000 b. 0.0000302 d. 0.0000302

- 26. These values were obtained as the mass of products from the same reaction: 8.83 g; 8.84 g; 8.82 g. The calculated mass of products from that reaction is 8.60 g. The measured values are
 - a. accurate, but not precise.
- c. both accurate and precise.
- b. precise, but not accurate.
- d. neither accurate nor precise.

27. MATTER - Properties and Changes

- An example of an extensive physical property is
- a. mass.

b. density.

- c. color.
- d. boiling point.
- 28. A chemical change occurs when
 - a. sugar dissolves in water.
 - b. paper is cut in many pieces.
 - c. salt remains when water evaporates from a salt water mixture.
 - d. wood is burning in the fireplace.

29. A physical property that DOES NOT change when you change the amount of the substance (ex. color does not change when the crayon is cut in half) is

- a. an intensive property.
 - c. independent variable.
- b. an extensive property.
- d. dependent variable.

- 30. A physical change is
 - a. description of observations and measurements.
 - b. description of a chemical's reactivity.
 - c. when the composition of a substance is unchanged, only changes appearance.
 - d. when the composition of a substance is changed, creating something new.

- 31. A chemical property is
 - a. description of observations and measurements.
 - b. description of a chemical's reactivity.
 - c. when the composition of a substance is unchanged, only changes appearance.
 - d. when the composition of a substance is changed, creating something new.



32.

Henry Jenkins' mom baked him a pie for his 35th birthday. This is an example of a a. physical change. c. both a physical and chemical

- change. d. none of the above.
- b. chemical change.
- _ 33. A chemical change is
 - a. description of observations and measurements.
 - b. description of a chemical's reactivity.
 - c. when the composition of a substance is unchanged, only changes appearance.
 - d. when the composition of a substance is changed, creating something new.



34.

What type of substance is shown in the picture above?

- a. element
- b. compound

- c. mixture of elements
- d. mixture of elements and compounds



35.

- What type of substance is shown in the picture above?
- a. element
- b. compound

- c. mixture of elements
- d. mixture of compounds

- 36. What is a mixture?
 - a. 2 or more substances that are mixed together, but NOT chemically combined.
 - b. 2 or more substances that are mixed together and chemically combined.
 - c. 2 or more elements that are chemically combined
 - d. none of the above
- 37. Which of the following is an example of a pure substance?
 - a. Air c. Kool-aid
 - b. Glucose $(C_6H_{12}O_6)$ d. Pizza
 - 38. In water, there are always 2 hydrogen atoms for every 1 oxygen atom. The elements cannot be separated by physical means. What type of matter is water?
 - a. element c. heterogeneous mixture
 - d. homogeneous mixture b. compound
 - 39. Which of the following could **you** physically separate?
 - a. elements c. compounds
 - b. pure substances d. mixtures
- 40. Which of the following is an example of a mixture?
 - a. Air c. Salt
 - b. Silver d. Carbon dioxide
- 41. A substance that is made up of only one type of matter and cannot be broken down is called a(n)
 - a. pure substance
 - b. liquid

- c. homogeneous mixture
- d. heterogeneous mixture

42. ATOMIC STRUCTURE

- Neutrons have
- a. negative charges. c. no charges.
- b. positive charges. d. no mass.
- 43. The atomic number ALWAYS represents the number of
 - a. atoms. c. neutrons.
 - b. protons. d. nuclei.
- 44. Who discovered the protons and nucleus with the Gold Foil Experiment?
 - c. Rutherford a. Bohr
 - b. Dalton d. Thomson
 - 45. An atom is electrically neutral because
 - a. neutrons balance the protons and electrons.
 - b. nuclear forces stabilize the charges.
 - c. the numbers of protons and electrons are equal.
 - d. the numbers of protons and neutrons are equal.

- 46. A particle that has about the no mass and with a **NEGATIVE** charge is called a(n)
 - a. nuclide.
 - b. neutron.

- c. electron.
- d. proton.
- ____ 47. The nucleus of most atoms is composed of
 - a. tightly packed protons.
 - b. tightly packed neutrons.
 - c. tightly packed protons and neutrons.
 - d. tightly packed protons and electrons.
- _____ 48. Krypton has atomic number of 36 and mass number of 84. It has
 - a. 36 protons, 36 electrons, and 120 neutrons.
 - b. 84 protons, 84 electrons and 36 neutrons.
 - c. 36 protons, 36 electrons, and 48 neutrons.
 - d. 48 protons, 48 electrons, and 36 neutrons.

_____ 49. The maximum number of electrons that can be found in the 1st energy level of an atom is

a.	1.	с.	8.
b.	2.	d.	18.

_ 50. Protons have

- a. negative charges.c. no charges.b. positive charges.d. no mass.

____ 51. Electrons are located

- a. in the nucleus of an atom. c. in the energy levels.
- b. bonded to protons. d. bonded to neutrons.

52. **<u>ISOTOPES</u>**

How many neutrons does Bromine-82 contain?

- a. 12 c. 47 b. 34 d. 82
- _ 53. An sodium isotope consists of 11 protons, 11 electrons, and 12 neutrons. Its mass number is
 - a. 11. c. 22. b. 12. d. 23.

____ 54. What is the nuclear notation for an element with 26 protons and 30 neutrons?

- a. ²⁶Fe c. ⁵⁶Ba b. ⁵⁶Fe d. ⁴Be
- ____ 55. Isotopes of the same element must have the same number of
 - a. neutrons c. electrons
 - b. protons d. neutrons and protons
 - 56. Which element contains the largest number of neutrons per atom?
 - a. Copper-64 c. Iron-56
 - b. Nickel-59 d. Manganese-55

 	a. N: ^{b.} N: ^{c.} N: ^{d.} N:	
 67.	How many electrons can occupy each orbital in each energy level? a. two, in opposite directions $\uparrow \downarrow$ c. one \uparrow b. two, in same direction $\uparrow \uparrow$ d. no more than eight What is the correct Lewis Dot structure for nitrogen?	
 66.	The element with electron configuration $1s^22s^22p^63s^23p^4$ is a. P c. S b. O d. Si	
 65.	Elements in which the "d" sublevel is being filled are also known asa. transition metals.c. metalloids.b. halogens.d. alkaline earth metals.	
 64.	The <u>number of orbitals</u> for the " <i>f</i> " sublevel is a. 1 c. 5 b. 3 d. 7	
 63.	What is given off when an electron falls back down to its ground state configurationa. electronsc. protonsb. lightd. elements	?
 62.	ELECTRON CONFIGURATIONFor the "d" sublevel, the TOTAL number of electrons isa. 5c. 10b. 7d. 14	
 61.	A negative ion is known as a(n)a. ionic radius.b. anion.c. cation.d. valence electron.	
 60.	What is the oxidation number for sodium?a1c7b. +1d. +7	
 59.	Fluorine belongs to Group 17.What is the oxidation number for fluorine?a1c7b. +1d. +7	
 58.	OXIDATION NUMBERSSulfur belongs to Group 16.What is the oxidation number for sulfur?a. +2c. +6b2d6	
 57.	Neon has 3 isotopes, ²⁰ Ne, ²¹ Ne, and ²² Ne. Which isotope of neon is the most comm a. ²⁰ Ne c. ²² Ne b. ²¹ Ne d. There is not enough information.	ion?

 69.	What shape do the "s" sublevel's orbitalsa. sphericalcb. propellerd	have? c. double propeller d. "flower"
 70.	What shape do the " <i>d"</i> sublevel's orbitals a. spherical c b. propeller d	s have? c. double propeller d. "flower"
 71.	PERIODIC TABLE A vertical column of elements in the perioda. family.cb. group.d	odic table is called a(n) c. period. d. either a or b.
 72.	The number of valence electrons for pota a. 1. c b. 2. d	assium is c. 7. d. 8.
 73.	Who attempted to organize the elements a. Moseley c b. Mendeleev d	s into a table by increasing atomic mass? c. Rutherford d. Dalton
 74.	To which group do sodium and rubidium a. Alkali metals c b. Transition metals d	belong? c. Halogens d. Noble gases
 75.	What group do strontium and barium beloa. Alkali metalscb. Alkaline Earth Metalsd	long to? c. Halogens d. Noble Gases
 76.	Which element is largest in size?a. magnesiumcb. nitrogend	c. rubidium d. calcium
 77.	Put the following elements in order of inc electrons (less energy to more energy): a. Ba, Cu, Br, Cl c b. Cu, Cl, Br, Ba d	creasing energy required to remove valence Ba, Br, Cl, Cu c. Cu, Br, Ba, Cl d. Cl, Br, Cu, Ba
 78.	Which element has a stronger attraction a. oxygen c b. boron d	n for electrons? c. aluminum d. lithium
 79.	The elements that have properties of both a. metals. c b. semi-metals. d	th metals and nonmetals are c. metalloids. d. nonmetals.
 80.	Which of the following is a metalloid?a. aluminumcb. arsenicd	c. carbon d. selenium

 81.	Which element is smallest in size? a. magnesium b. nitrogen	c. d.	rubidium calcium
 82.	Put the following elements in order of \mathbf{i}	ncr	easing size (smallest to largest):
	a. Ca, Rb, Si, S b. Rb, Ca, Si, S	c. d.	Si, S, Ca, Rb S, Si, Ca, Rb
 83.	BONDING Name the compound MgCl ₂ . a. magnesium chloride II b. magnesium chlorine	c. d.	magnesium chloride magnesium dichloride
 84.	Based on the location of the element, n need to be stable or "happy" like the Na a. 1 b. 3	nitro oble c. d.	gen, <u>how many more electrons</u> does nitrogen e gases? 5 8
 85.	To show the oxidation number for trans of the compound. a. symbol b. letter	itioı c. d.	n metals, a must be used in the name Roman numeral number
 86.	What is the formula for copper II chlori a. Cu_2Cl b. $CuCl_2$	de? c. d.	CuCl CoCl
 87.	Using the criss-cross method, what would a. Li_2O b. LiO	uld c. d.	be the compound formed from Li and O? LiO ₂ LiOH
 88.	Which of the following is a cation? a. Argon b. Chlorine	c. d.	Oxygen Magnesium
 89.	Which of the following is an anion? a. Argon b. Chlorine	c. d.	Sodium Magnesium
 90.	Which of the following is a property of aa. Sharing electronsb. Uses number prefixes in namingc. Conducts electricityd. Bond between non-metal and non-r	an i neta	onic compound? al
 91.	Which of the following is a property of a a. low melting point b. water soluble	a co c. d.	ovalent compound? EN difference of 1.5 or higher conducts electricity

 92.	The chemical bond formed when one a a. ionic bond. b. orbital bond.	tom <u>transfers</u> electrons to another is called a(n) c. Lewis structure. d. covalent bond.
 93.	The chemical bond formed when atoms a. ionic bond. b. orbital bond.	s <u>share</u> electrons with eachother is called a(n) c. Lewis structure. d. covalent bond.
 94.	How many total atoms are present in o A. 1 B. 2	ne unit of sodium sulfate, Na ₂ SO ₄ ? C. 4 D. 7
 95.	Reactions between atoms involve only A. valence electrons B. inner electrons	C. neutrons D. protons

_____ 96. The molar mass of Sodium is ______ g/mol