

Name _____

Period _____

Date _____

Review for Semester 1 Final Examinations

____1.

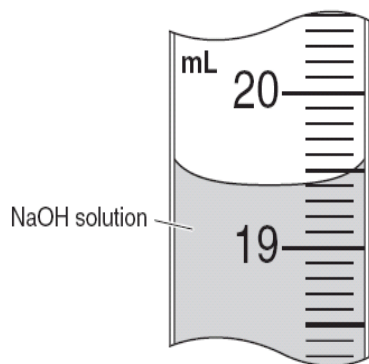
The reason for wafting or fanning a small amount of chemical vapors toward the nose as a means to detect odors in a test tube is to —

- A avoid experimental error from excessive loss of mass of reactants or products
- B avoid splashing chemicals into the face of any person
- C protect the respiratory tract against potentially harmful vapors
- D determine the relative strength of the odor before smelling directly

____2. According to the periodic table, which of the following is the electron configuration for magnesium?

- A. 2 – 8 – 2
- B. 2 – 8 – 8 - 6
- C. 2 – 8 – 4
- D. 2 – 8

____3.



Section of pipette

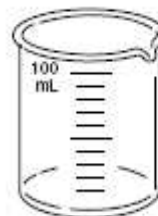
What is the volume reading for the solution in the pipette?

- A. 19.4 mL
- B. 19.6 mL
- C. 20.4 mL
- D. 20.6 mL

____4.

Which of the following pieces of equipment would be most appropriate for measuring the volume of a marble?

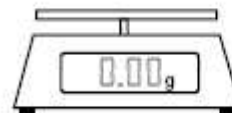
A



B



C



D

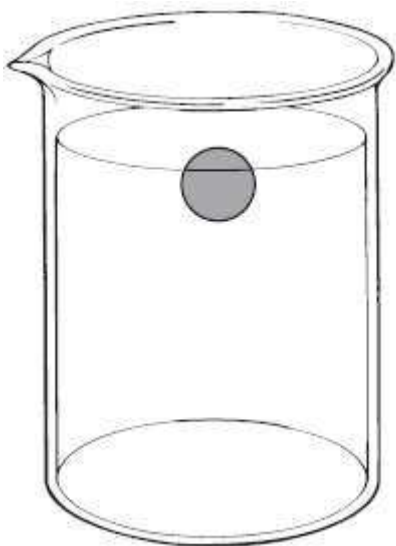


____5. An unknown silvery powder has a constant melting point and does not chemically or physically separate into other substances. The unknown substance can be classified as ____.

- A. an element
- B. A compound
- C. A mixture
- D. An alloy

___6.

Substance	Melting Point (°C)	Density (g/mL)
Q	460	0.72
R	650	1.74
S	81	1.00
T	142	0.94



The table shows some properties of four different substances. The picture shows a solid sphere of one of the four substances in a water-ethanol solution ($D = 0.9199 \text{ g/mL}$). The sphere is most likely composed of which substance?

- A Substance Q
- B Substance R
- C Substance S
- D Substance T

___7.

In the rock cycle, which of these is a chemical change involved with the formation of igneous rocks?

- F Compression of sediments
- G Heat loss from lava
- H Subduction of plates
- J Formation of minerals

___8.

Hypothesis: At the end of each summer, Texas red oak (*Quercus buckleyi*) leaves turn red and fall off the trees. This is most likely caused by changes in air temperature and sunlight intensity.

Which equipment is most useful when measuring the two environmental changes mentioned above?

- F Barometer and voltmeter
- G Light meter and barometer
- H Voltmeter and thermometer
- J Thermometer and light meter

___9. A sugar cube in a test tube is heated over a Bunsen flame. The sugar cube turns black and has less mass than before it was heated. These changes occur because the sugar has _____.

- A. melted
- B. boiled
- C. reacted chemically
- D. become hydrated

___10.

Sheets of ice containing mostly pure water can be formed by decreasing the temperature of saltwater. Which of these best describes this change?

- F Chemical change
- G Physical change
- H Nuclear change
- J Atomic change

___11. Which set of equipment would be best to use to test the effect of temperature on solution acidity?

- F. a balance and a thermometer
- G. a pH meter and a barometer
- H. a balance and a litmus paper
- J. a thermometer and a pH meter

___12.

Most Abundant Elements at Earth's Surface

Element	Percent by Mass
Oxygen	46.6
Silicon	27.7
Aluminum	8.13
Iron	5.00
Calcium	3.63

Which conclusion is best supported by these data?

- F** Earth's surface is composed mostly of silicon and calcium.
- G** Oxygen is closer to Earth's surface than aluminum.
- H** There is more aluminum than calcium at Earth's surface.
- J** Silicon is much heavier than iron at Earth's surface.

___13.

Only 10% of the electrical energy operating a lightbulb is changed into visible light. Which instrument helps identify the energy change occurring to most of the remaining 90%?

- F** Triple-beam balance
- G** Thermometer
- H** Magnifying glass
- J** Prism

___14. The observation that the air bubble in water rises to the surface is explained by the principle of _____.

- A. viscosity
- B. Buoyancy
- C. Interference
- D. polarity

___15.

Question: Question: Does the reaction of water and sodium hydroxide crystals give off heat?

Which of these lists the steps of this investigation in the correct order?

A

1. Add water to a beaker
2. Measure the temperature of the water
3. Add sodium hydroxide to the beaker
4. Stir until the solution has no crystals
5. Measure the temperature of the solution

B

1. Add sodium hydroxide to a beaker
2. Add water to the beaker
3. Measure the temperature of the water
4. Stir until the solution has no crystals
5. Measure the temperature of the solution

C

1. Add water to a beaker
2. Measure the temperature of the water
3. Add sodium hydroxide to the beaker
4. Measure the temperature of the solution
5. Stir until the solution has no crystals

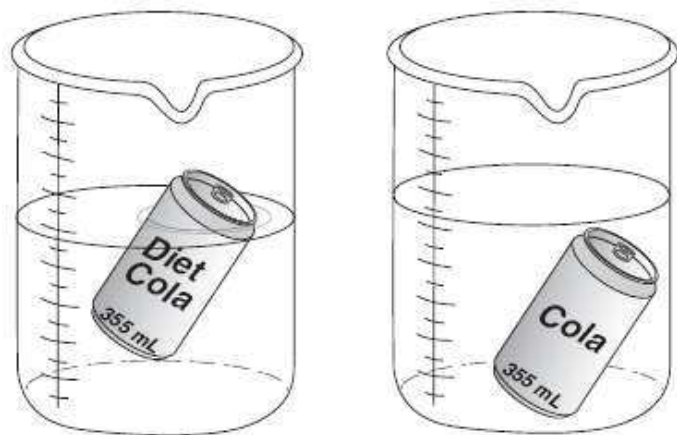
D

1. Add sodium hydroxide to a beaker
2. Stir until the solution has no crystals
3. Add water to the beaker
4. Measure the temperature of the water
5. Measure the temperature of the solution

___16. When iron and sulfur physically unite, they form _____.

- F. an ion
- G. a gas
- H. a compound
- J. a mixture

17.



A diet cola and a regular cola in identical cans are each placed in separate beakers containing water. Which of the following conclusions is best for the experiment shown above?

- E. The diet cola is less dense than the regular cola.
- F. The diet cola has fewer calories than the regular cola.
- G. There is more buoyant force on the can of diet cola than on the regular cola.
- H. There is more liquid on the can of diet cola than in the regular cola.

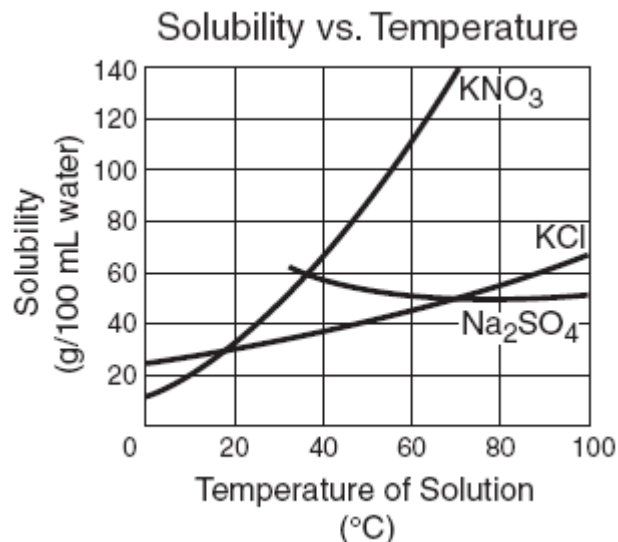
18.

Sample	pH
W	7.1
X	3.3
Y	5.2
Z	

A student records the pH values of three samples and is asked to predict the pH of a fourth sample. The student is told that Sample Z is less acidic than Sample X but more acidic than Sample Y. Which of the following is a valid conclusion about the pH of Sample Z?

- F It is less than 3.3.
- G It is between 3.3 and 5.2.
- H It is between 5.2 and 7.1.
- J It is greater than 7.1.

19.



Which of the following describes a trend in the data shown in the graph above?

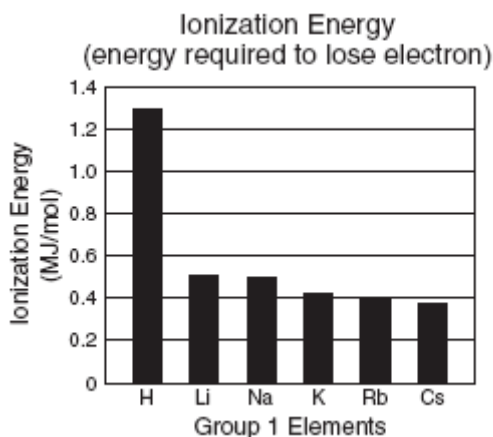
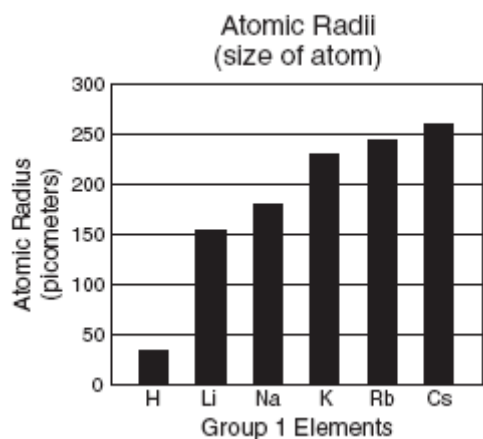
- A The solubility of all the salts increases as temperature increases.
- B As temperature increases from 30°C to 60°C, the solubility of KNO₃ increases more than that of KCl.
- C An increase in atmospheric pressure causes an increase in the solubility of KCl.
- D Increasing the temperature of a KNO₃ solution from 30°C to 60°C decreases the solubility of KNO₃ by half.

20.

An element is discovered that has an atomic number of 118 and 8 valence electrons. The element is most likely —

- A a noble gas
- B an alkali metal
- C a halogen
- D a transition metal

21.



Data for the atomic radii and ionization energies of elements in Group 1 are shown above. Which statement regarding these elements is supported by this information?

- A. Electrons closer to the nucleus require more energy to remove.
- B. Elements with greater atomic mass require more ionization energy.
- C. Elements with small atomic radii easily gain electrons.
- D. Electrons are lost from the inner energy levels first.

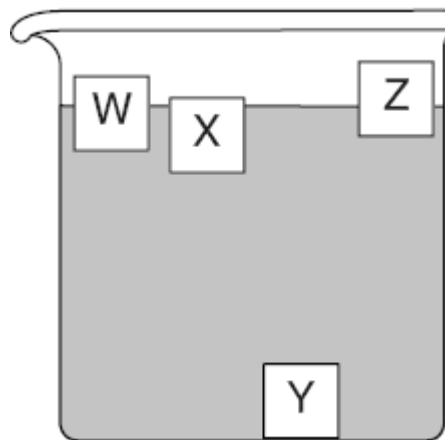
22.

The chemical formula for calcium chloride is —

- F Ca_2Cl
- G CaCl
- H CaCl_2
- J Ca_2Cl_3

23.

Buoyancy of Wood Blocks



Type of Wood	Density (g/cm ³)
Balsa	0.12
Ebony	1.22
Maple	0.67
Poplar	0.42

According to this information, Block Z is *most likely* composed of _____.

- A balsa
- B ebony
- C maple
- D poplar

24. The bonding characteristics of barium are most similar to the bonding characteristics of _____.

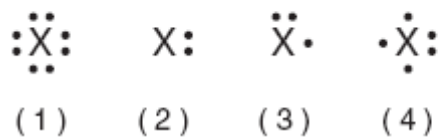
- A. Beryllium
- B. Cesium
- C. Radon
- D. Sulfur

25. Which of these elements is *most likely* to accept (gain) one electron?

- A. Oxygen
- B. Fluorine
- C. Sodium
- D. Strontium

____26.

Which Lewis electron-dot diagram represents an atom in the ground state for a Group 13 element?



____27.

Which element forms a compound with chlorine with the general formula $M\text{Cl}$?

- | | |
|--------|--------|
| (1) Rb | (3) Re |
| (2) Ra | (4) Rn |

____28. Which of the following statements **best explains** why sodium (Na) readily reacts with chlorine (Cl)?

- A. Sodium can readily donate its one valence electron to chlorine; chlorine needs one more electron to complete its outermost energy level.
- B. Sodium has only one valence electron; it can readily accept the seven valence electrons of chlorine to complete its outermost energy level.
- C. Chlorine and sodium have the same number of energy levels.
- D. Chlorine and sodium complete their electrons on the same main energy levels.

____29. Which element has the electron configuration of $1s^22s^22p^63s^2$?

- A. Sodium
- B. Magnesium
- C. Iron
- D. Potassium

____30. Which section on the periodic table **does not** contain metalloids?

- A. Period 3
- B. Group 2
- C. Group 14
- D. Period 5

____31. Which of the following elements is classified as a nonmetal?

- A. Aluminum
- B. Chromium
- C. Selenium
- D. Radon

____32.

Which element is a metalloid?

- | | |
|--------|--------|
| (1) Al | (3) As |
| (2) Ar | (4) Au |

____33.

An element that is malleable and a good conductor of heat and electricity could have an atomic number of

- | | |
|--------|--------|
| (1) 16 | (3) 29 |
| (2) 18 | (4) 35 |

____34. A certain atom has a nucleus containing 10 protons and 11 neutrons and has 10 neutrons orbiting the nucleus. This atom is a form of an element that belongs to what group in the periodic table?

- A. Group 2
- B. Group 12
- C. Group 17
- D. Group 18

____35. Which of the following **is not** a likely reason why atoms combine with other atoms?

- A. Atoms combine in order to have eight valence electrons.
- B. Atoms combine to have a full outer energy level.
- C. Atoms combine to attain stability and be like the noble gases.
- D. Atoms combine to double their sizes.

____36. Lithium and sulfur combine to form an ionic compound. What is the formula for this ionic compound?

- A. LiS
- B. Li₂S
- C. LiS₂
- D. Li₂S₂

____37. What is the correct formula for radium iodide?

- A. RaI
- B. Ra₂I
- C. Ra₂I₂
- D. RaI₂

____38. The Lewis dot structure shown below represents an atom of an unknown nonmetallic element N.



When atoms of this unknown nonmetal react with sodium, a compound is formed. Which of the following is the most likely chemical formula of the resulting ionic compound?

- A. NaN
- B. NaN₃
- C. Na₃N
- D. Na₃N₃

____39. Which set of elements have chemical properties that are most similar?

- A. Ga, Ge, As
- B. Cu, Zn, Ag
- C. Ar, Kr, Xe
- D. Fe, Co, Ni

____40. How many valence electrons does a bromine atom have?

- A. 1
- B. 3
- C. 5
- D. 7

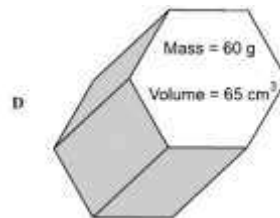
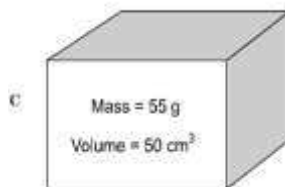
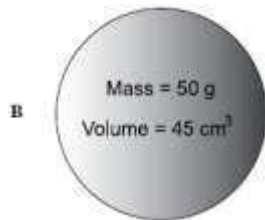
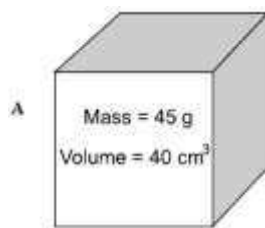
____41. Which of the following is an ionic compound?

- A. CO₂
- B. Fe
- C. NaF
- D. N₂O₅

____42. A compound with the formula CCl₄ is named as _____.

- A. carbon chloride
- B. Carbon 1 Chloride 4
- C. Carbon tetrachloride
- D. Monocarbon tetrachloride

____43. Which of the following objects will float on water?



____44. When two nonmetallic elements combine, they form a/an _____.

- A. Ionic bond
- B. Covalent bond
- C. Network bond
- D. Metallic bond

____45. Which of the following is the correct Lewis electron dot symbol for selenium?

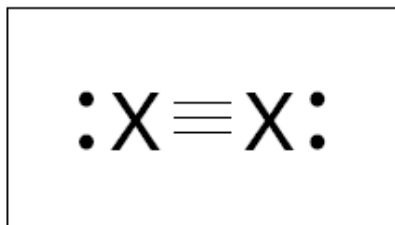
- A. $\cdot \text{Se} \cdot$ C. $\cdot \text{Se} \cdot$
- B. $\cdot \text{Se} \cdot$ D. Se

____46.

Which represents a chemical change in matter?

- A. carbon dioxide undergoing sublimation
- B. water dissolving salt to form a solution
- C. water undergoing evaporation
- D. metal post beginning to rust

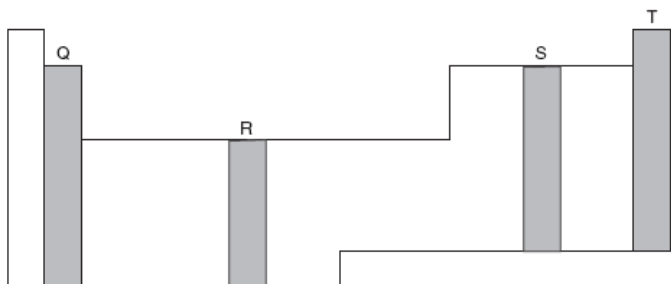
55.



If the above diagram were the correct representation for the Lewis structure of a molecule, then the X would be representative of the element —

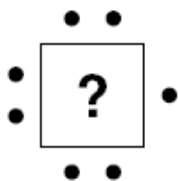
- A oxygen
- B fluorine
- C nitrogen
- D sulfur

56. In which region on the periodic table diagram below would a metalloid be found?



- A. Q
- B. R
- C. S
- D. T

57.



Which of the groups below has the electron dot structure shown above?

- A Noble gases
- B Halogens
- C Alkali metals
- D Transition elements

58.

Several common metals are listed in this chart.

Common Metals

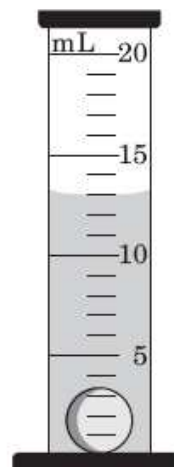
Metal	Density (g/cm ³)
aluminum	2.7
iron	7.9
lead	11.4
silver	10.5

Assuming equal masses of each, a cube of which metal would have the **greatest** volume?

- A aluminum
- B iron
- C lead
- D silver

59.

This diagram shows a marble with mass of 3.8 g that was placed into 10 mL of water.

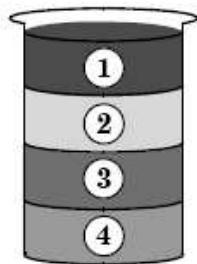


What is the density of the marble?

- A 0.79 g/cm³
- B 0.95 g/cm³
- C 1.05 g/cm³
- D 1.27 g/cm³

___60.

This diagram represents four different liquids that have been poured into a container and have separated.



Which liquid has the greatest density?

- A liquid ①
- B liquid ②
- C liquid ③
- D liquid ④

___61. When potassium (K) combines with sulfur (S) it forms the compound K_2S . The correct name for this compound is _____.

- A. potassium sulfic
- B. potassium sulfite
- C. potassium sulfide
- D. potassium sulfate

___62.

Main energy level	Number of electrons
1	2
2	8
3	8
4	2

The element described by the information above is the element _____ and it is a member of group _____.

- A. Potassium, 2
- B. Calcium, 2
- C. Zirconium, 4
- D. Argon, 18

___63. What is the name of the compound $Ba(NO_3)_2$?

- A. barium nitrogen oxide
- B. barium nitrogen oxygen
- C. barium nitride
- D. barium nitrate

___64. A group of students determined the density of an unknown liquid sample. They recorded their data in the table below:

Mass of empty cylinder	24.5 g
Mass of cylinder and liquid	36.0 g
Mass of liquid	? g
Volume of liquid	? mL
Density of liquid	1.1 g/mL

What are the mass and volume of the liquid sample?

- A. 10.4 g, 11.5 mL
- B. 11.5 g, 10.4 mL
- C. 12.65 g, 11.5 mL
- D. 11.5 g, 12.65 mL

___65. A student compares the viscosities of two solutions at room temperature. The student uses a metal block and equal volumes of the two solutions in identical containers. Which procedure would provide the best comparison for the viscosities of the solutions?

- A. determining whether the block raises or lowers the density of either solution
- B. determining whether the block raises or lowers the temperature of either solution
- C. measuring the volume of liquid the block displaces in each solution
- D. measuring the time it takes the block to sink in each solution