***Science 10***

Unit A : Chemistry



PRE-UNIT TEST

# Part I : Multiple Choice ( 1 mark each ) 41 marks

 Numeric Response (1 mark each) 2 marks

## Part II : Written Response 30 marks

 Total \_\_ marks

 73

 = \_\_\_\_\_ %

### Name : **KEY**

Date : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Good luck!!!*

***Part I : Multiple Choice and Numeric Response – ANSWER ON BUBBLE SHEET***

**NUMERIC RESPONSE**

**NR 1.** Match the number of the WHMIS symbol that would be on the label with the substance.

|  |  |  |  |
| --- | --- | --- | --- |
| 1. pic3
 | pic52. | pic43. | pic14. |

**# of Symbol: \_\_\_\_\_\_3\_\_\_\_\_\_ \_\_\_\_\_1\_\_\_\_\_\_\_ \_\_\_\_\_4\_\_\_\_\_\_\_ \_\_\_\_\_2\_\_\_\_\_\_\_**

**Substance: A tank of A can of A disposal bucket A bottle of strong**

 **helium gasoline for blood needles hydrogen peroxide**

(Record you FOUR digit answer on the bubble sheet)

1. A chemical property is demonstrated by
	1. oil floating on water
	2. wood burning in a fire place
	3. ice melting and turning to liquid
	4. mercury is a silver, liquid at room temperature
2. Which of the following statements is TRUE?
	1. In a chemical reaction, matter and energy are lost.
	2. In a chemical reaction, matter and energy are gained.
	3. In a chemical reaction, matter and energy are released.
	4. In a chemical reaction, matter and energy are conserved.

*Use these examples to answer the question.*

1. Sodium “burning” in water
2. Formation of clouds
3. Ammonia smelling bad
4. Bubbles on magnesium in vinegar
5. The examples of physical properties are
	1. 1 and 2
	2. 1 and 4
	3. 2 and 3
	4. 3 and 4
6. When a compound breaks into its elements the elements will have properties that are
	1. the same as the compound both physically and chemically
	2. different from the compound both physically and chemically
	3. the same as the compound physically but different chemically
	4. the same as the compound chemically but different physically
7. A pure substance contains
	1. one kind of element only
	2. one kind of element or compound
	3. two or more kinds of elements only
	4. two or more kinds of elements or compounds
8. An unknown substance was found to conduct electricity and turned blue litmus paper red. Which of the following chemical formulas belongs to the unknown substance?
	1. H2SO4 (aq)
	2. MgCl2 (aq)
	3. Ca(OH)2 (aq)
	4. S2O5 (aq)
9. Who was one of the first scientists to propose a model of the atom that had electrons? His model looked like a plum pudding or a raisin muffin.
	1. Dalton
	2. Rutherford
	3. Thomson
	4. Bohr
10. Which subatomic particles are contained outside the nucleus of the atom?
	1. protons only
	2. electrons only
	3. protons and neutrons
	4. protons and electrons
11. The properties that are characteristic of non-metals are
	1. dull, brittle, conductors
	2. dull, brittle, non-conductors
	3. malleable, ductile, conductors
	4. shiny, malleable, non-conductors
12. The properties that best describe copper are
	1. dull, brittle, solid
	2. dull, black, liquid
	3. shiny, malleable, non-conductor
	4. shiny, malleable, conductor
13. The substance that has the characteristics of a non-metal is
	1. silicon
	2. aluminum
	3. sodium
	4. calcium
14. The mass of an atom is found
	1. almost entirely in the nucleus
	2. almost entirely outside the nucleus
	3. split evenly between the nucleus and the outside shells
	4. in only the neutrons in the nucleus
15. The period an atom is in reveals
	1. how many protons it has.
	2. how many electrons it has.
	3. how many energy levels it has.
	4. how many valence electrons it has.
16. The group or family an atom is in reveals
	1. how many protons it has.
	2. how many electrons it has.
	3. how many energy levels it has.
	4. how many valence electrons it has.
17. An ion is charged because the number of
	1. protons has increased or decreased.
	2. neutrons has increased or decreased.
	3. electrons has increased or decreased.
	4. protons and electrons has changed.
18. The part(s) of an atom that determines the mass of that atom is
	1. protons
	2. neutrons
	3. protons and neutrons
	4. electrons
19. If you changed the number of these in an atom, you would get a new element:
	1. electrons
	2. protons
	3. neutrons
	4. energy levels
20. What is the name given to a NEGATIVELY charged ion?
	1. anion
	2. neggion
	3. cation
	4. poison
21. The periodic table is arranged by
	1. elements of increasing mass.
	2. elements of increasing reactivity.
	3. elements of decreasing reactivity.
	4. elements of increasing numbers of protons.
22. The number of valence electrons in atoms in each of groups 1, 2, and 17 respectively are
	1. 1, 2, 7
	2. 1, 2, 8
	3. 2, 1, 18
	4. 2, 1, 8
23. Which of the following elements is LEAST reactive?
	1. Francium because it is far left and down on the periodic table.
	2. Fluorine because it is far right and up on the periodic table.
	3. Hydrogen because it is a non-metal but forms positive ions.
	4. Neon because its outer energy level is full of electrons.
24. When two or more atoms interact, the electrons most affected are the electrons that are
	1. lost
	2. gained
	3. in the inner energy level
	4. in the outer energy level
25. Molecular compounds are composed of
	1. metals and non-metals
	2. noble gases and metalloids
	3. non-metals and non-metals
	4. metals and metals
26. Which statement is TRUE for calcium to have a full outer shell of electrons?
	1. Calcium gains 2 electrons to make a positively charged ion.
	2. Calcium loses 2 electrons to make a positively charged ion.
	3. Calcium gains 1 electron to make a positively charged ion.
	4. Calcium loses 1 electron to make a positively charged ion.
27. In the formation of ionic compounds, non-metal atoms
	1. lose electrons and form positive ions
	2. gain electrons and form positive ions
	3. lose electrons and form negative ions
	4. gain electrons and form negative ions
28. When the two elements magnesium and nitrogen combine to form magnesium nitride, the corresponding gain or loss of electrons for each atom of magnesium and nitrogen respectively will be
	1. gain 3; lose 2
	2. gain 2; lose 3
	3. lose 3; gain 2
	4. lose 2; gain 3
29. Molecular compounds are composed of
	1. ions and are conductive in water
	2. ions and are not conductive in water
	3. molecules and are conductive in water
	4. molecules and are not conductive in water
30. When metals form compounds with non-metals they
	1. lose one or more electrons to become positive ions
	2. gain one or more electrons to become positive ions
	3. lose one or more electrons to become negative ions
	4. gain one or more electrons to become negative ions
31. An example of a molecular compound is
	1. H2O
	2. CaI2
	3. Pb2O3
	4. MgCl2
32. Molecular compounds are formed as the result of atoms
	1. sharing electrons
	2. elevating electrons
	3. exchanging electrons
	4. transferring electrons
33. The correct formula for barium bromide is
	1. BaBr
	2. BaBr2
	3. Ba2Br
	4. Ba2Br2
34. The roman numeral used in naming ionic compounds with transition metals shows
	1. the number of metal ions present.
	2. the number of non-metal ions present.
	3. the charge on the metal ion.
	4. the charge on the non-metal ion.
35. A prefix attached to the name of non-metals when naming compounds represents
	1. how many atoms of the non-metal are in the compound.
	2. how many atoms of another element must combine with the non-metal.
	3. the charge on that non-metal.
	4. the charge on the element that combines with the non-metal.
36. The correct name for S2O5 is
	1. sulfur oxide
	2. pentasulfur dioxide
	3. sulfur (II) oxide (V)
	4. disulfur pentaoxide
37. The ionic compound is
	1. S4N4
	2. H2O
	3. NH4Cl
	4. PO4
38. An indicator is indicating the presence of an base when
	1. red litmus paper stays red
	2. red litmus paper turns blue
	3. blue litmus paper stays blue
	4. blue litmus paper turns red
39. What type of reaction will ALWAYS have the same products?
	1. formation
	2. single replacement
	3. double replacement
	4. hydrocarbon combustion
40. The chemical equation representing a decomposition reaction is
	1. 2 NaCl(s) ===> 2 Na(s) + Cl2(g)
	2. 2 Mg(s) + O2(g) ===> 2 MgO(s)
	3. NaOH(aq) + HCl(aq)­ ===> NaCl(s) + H2O(l)
	4. 2 C8H18(l) + 25 O2(g) ===> 16 CO2(g) + 18 H2O(g)
41. How many atoms are in one molecule of sucrose?
	1. 3
	2. 24
	3. 45
	4. 12

**NUMERIC RESPONSE**

**NR 2.** How many molecules in 5.5 moles of water?

**3.31** x 1024 molecules

(Record your answer with 3 significant digits – or to TWO decimal places on the bubble sheet)

1. What is the molar mass of ammonia?
	1. 15.02 g/mol
	2. 16.03 g/mol
	3. 17.04 g/mol
	4. 18.05 g/mol
2. What is the number of moles in 20.0 g of CaBr2?
	1. 0.100 mol
	2. 9.994 mol
	3. 0.167 mol
	4. 5.999 mol

--------------------------------------------------------------------------------------------------------------------------

***Formulas & Constants***

1 mol = 6.02 x 1023 atoms/molecules



m = mass

M = molar mass

n = number of moles***Part II : Written Response ( 30 marks )***

1. Complete the table for the following atoms. (1/2 mark each blank – total of 6 marks). Calculate neutrons after you round the mass.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Atomic # | Element Name | Symbol | # of neutrons | # of electrons | Atomic Mass **(rounded to nearest whole #)** |
| 19 | potassium | K | 20 | 19 | 39 |
| 5 | boron | B | 6 | 5 | 11 |
| 24 | chromium | Cr | 29 | 24 | 53 |

1. Name three safety precautions you should take before and while working a science lab. (3 marks)

\_\_\_\_\_safety goggles\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_label chemicals\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_tie hair back\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Complete the table. (1/2 mark each blank – total of 4 marks)

|  |  |  |
| --- | --- | --- |
| Ionic or Molecular | Formula | Name |
| ionic | NH4SCN | ammonium thiocyanate |
| ionic | Na2CO3  | sodium carbonate |
| ionic | Mn3N4 | manganese (IV) nitride |
| molecular | P3Br6 | triphosphorus hexabromide |

1. Balance the following equations. (1 mark each)

a) \_\_1\_\_ Ca3N2 + \_\_6\_\_ NH4OH 🡪 \_\_2\_\_ (NH4)3N + \_\_3\_\_ Ca(OH)2

1. \_\_1\_\_ C4H8 + \_\_6\_\_ O2 🡪 \_\_4\_\_ CO2 + \_\_4\_\_ H2O
2. \_\_1\_\_ Fe + \_\_4\_\_ HNO3 🡪 \_\_1\_\_ Fe(NO3)2 + \_\_2\_\_ NO2 + \_\_2\_\_ H2O
3. Re-write the reaction with correct formulae, identify the reaction type, then balance the following

( 4 marks each 🡪 1 for reactant(s), 1 for product(s), 1 for balancing, 1 for reaction type ).

cobalt (II) nitrate + titanium 🡪 cobalt + titanium (III) nitrate

Reaction Type: \_\_\_\_single replacement\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_3\_\_Co(NO3)2  + \_\_2\_\_ Ti 🡪 \_\_3\_\_Co + \_\_2\_\_ Ti(NO3)3

calcium sulfide forms calcium and sulphur

Reaction Type: \_\_\_\_decomposition\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_8\_\_ CaS 🡪 \_\_8\_\_ Ca + \_\_1\_\_ S8

methane burns in air

Reaction Type: \_\_\_\_\_hydrocarbon combustion\_\_\_\_\_\_\_\_\_\_\_\_

\_\_1\_\_ CH4 + \_\_2\_\_ O2 🡪 \_\_1\_\_ CO2 + \_\_2\_\_ H2O

1. Indicate whether the following combinations of ions have low solubility(s) or high solubility(aq) with each other. (1 mark each)

 Pb2+ and NO3- \_\_\_\_\_\_\_\_high solubility (aq)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Fe3+ and OH- \_\_\_\_\_\_\_\_low solubility (s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_