Form two chemistry holiday package 2021

1) The electronic configuration of element X is 2:8:6.
   a. Write the formula of the most common ion of X.
   b. Element X reacts with element M (atomic number =12)
      i) Write the electronic configuration of element M
      ii) State the type of bond that exists between M and X
      iii) Write the formula of the compound between M and X
2) Which of the following is an electronic configuration of inert gas?
   A. 2:8:8
   B. 2:8:7
   C. 2:8:6
   D. 2:8:8:1
1. The formula of an oxide of element X is X_2O.The formula of its chloride is
   A. XCl
   B. X_2Cl
   C. XCl_2
   D. X_2Cl_3
2. The electronic configuration of elements X, Y, Z and W are 2:8:5, 2:8:6, 2:8:3 and 2:8:2 respectively.
   a) Which elements are non-metals?
   b) Which elements form positive ions?
   c) Which elements will react to form covalent compounds?
   d) Write the formula of a compound formed when X and W combine.
3. State any two (2) differences between covalent bond and ionic bond.
4. Give five (5) differences between ionic compounds and covalent compounds.
5. Distinguish between lone pair and bond pair of electrons.
6. Give two (2) differences between a molecule and a molecule of a compound.
7. Solid sodium chloride and solid magnesium oxide are both held together by ionic (electrovalent) bonds. Using simple notation write down the symbol for and the electronic configuration of
   a)
      i. a sodium ion;
      ii. a chloride ion;
      iii. a magnesium ion;
      iv. An oxide ion.
   b) Explain what holds sodium and chloride ion together in the solid crystal.
   c) Sodium chloride melts at 1074 K; magnesium oxide melts at 3125 K. Both have identical structures. Why is there such a difference in their melting points?
8. Lithium and fluorine atoms have electron arrangements of 2:1 and 2:7 respectively

a. Explain how lithium and fluorine atoms combine
b. What is the name of the compound formed?
c. What is the type of bonding is in lithium fluoride?

9. Using a dot and cross diagrams, show how outer electrons are arranged in a molecule of
   a)
      (i) chlorine, Cl_2
      (ii) Ammonia, NH_3
      (iii) Carbon dioxide, CO_2
   b) What type of bonding is in chlorine, ammonia, carbon tetrachloride and carbon dioxide?
10. The positions of the elements A, B, C, D, E, F and G are shown in part of the periodic table below. The letters are not the usual symbols of the elements

I	II	III	IV	V	VI	VII	VIII
				F	A	B	
C		D	E				G

Use the letters to answer the following questions.

a) Write the electron arrangement of atom of A
b) State the number of electrons in the outer shell of an atom of D
c) Which is the most reactive metal?
d) Which is the most reactive non-metal?
e) Which element forms no compounds? Explain your answer.
f) Write the formula and state the type of bond between elements

(i) C and F
(ii) E and F
(iii)D and A
(iv)C and F
(v) F and A

11. Explain the differences between the properties of electrovalent and covalent compounds using sodium chloride and water as examples.
12. Discuss in what way the electron structure of the noble gases is important in both of these theories of bonding.
13. Explain the terms:

(a) Malleable
(b) Ductile

14. Explain why metals are able to conduct heat and electricity.
15. Explain why the melting point of magnesium (649^oC) is higher than the melting point of sodium (97.9^oC).
16. Atoms of elements X, Y and Z have 16, 17 and 19 electrons respectively. Atoms of argon have 18 electrons.

a) Determine the formulae of the compounds formed by the combination of the atoms of the elements;
X and Z, Y and Z, X itself.
b) In each of the cases (a) (i)-(iii) above, name the type of chemical bond formed.
c) Give two (2) properties you would expect to be shown by the compounds formed in (a) (ii) and (a) (iii).

17. Write the chemical formula of the following compounds

a. Sodium chloride
b. Potassium hydroxide
c. Calcium oxide
d. Copper (II) sulphate (VI)
e. Zinc (II) carbonate (IV)
f. Magnesium sulphate
g. Calcium phosphate

18. Write the formula of the following compounds

a. Iron (III) chloride
b. Lead (II)oxide
c. potassium nitrate
d. barium hydroxide
e. potassium hydrogen carbonate

19. Write the IUPAC names of the following compounds

a. $PbBr_2$
b. Pb_3N_2
c. AlI_3
d. Mg_3N_2
e. K_3P
f. BrF_5
g. SF_6
h. N_2H_4

20. A hydrated compound L contains 18.55%sodium, 25.8%sulphur, 19.35% oxygen and the rest being water of crystallization. Determine its molecular formula if its relative molecular mass is 248.
21. A hydrated compound contains 25.45% copper, 13%sulphur, 25.65% oxygen and the rest being water of crystallization. Determine;

a) Its empirical formula
b) Its actual formula, given the relative formula mass is 249.5.

22. The table below shows the mass numbers and atomic numbers of atoms labeled T to Z.

Atoms	mass numbers	atomic number
T	2	1
V	3	1
W	3	2
X	6	3
Y	9	4
Z	11	5

a. How many protons are there in atom of Y?
b. How many electrons are there in atom of W?
c. How many neutrons are there in atom of Z?
d. Which atoms are isotopes of the same element?
e. Which atom would readily form an ion with a single positive charge?
f. Which is an atom of a noble gas?