G.H.S S.2 CHEMISTRY HOLIDAY WORK ON THE PERIODIC TABLE AND REACTIVITY SERIES

CHEMISTRY

NAME:……..STREAM……..NO……

1. (a) Explain what is meant by the terms
(i) 'mass number'

……

……

……

……

(ii) 'atomic number'

……

……

……

……

(b) An atom of an element is represented by the symbol

$$^{40}_{15}X$$

(i) State the mass number of the atom

……

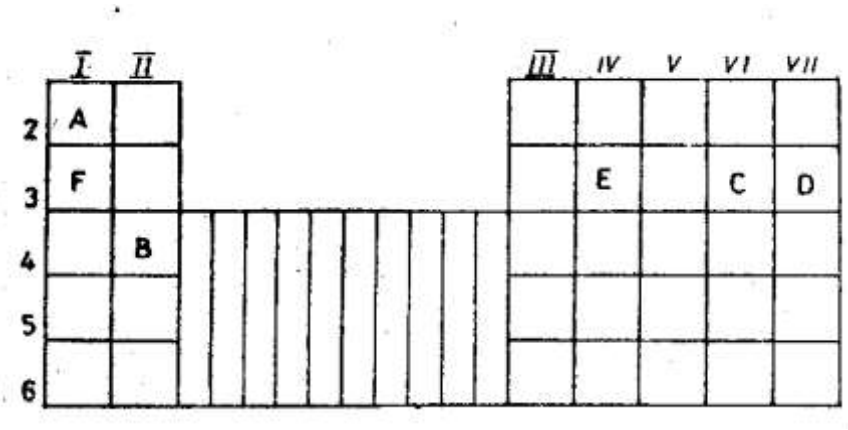
(ii) What is the atomic number of the atom?

……

(iii) How many neutrons are present in the atom?

……

2. The positions of the elements A, B, C, D, E and F are shown in the Periodic Table below. These letters are not the usual symbols for the elements.



(a) State the type of bonding in the compound formed between

(i) B and D

……

(ii) E and C

……

(b) (i) Which one of the elements A and B reacts vigorously with cold water?

……

(ii) Write equation for the reaction between water and the element you have named in (b) (i).

……

……

(c) From the table select two elements that can oxidize F.

……

……

3. Part of the Periodic Table indicating the positions of elements W, X, is shown below.

	I	II	III	IV	V	VI	VII	VIII
1								
2	W		X				Z	
3								
4								

(a) (i) Write the formula of the oxide of W.

……

(ii) The oxide of W was dissolved in water.
State whether the resultant solution is acidic, neutral or alkaline.
Explain your answer.

……

……

……

……

(b) Write the formula of the compound formed between X and Z.

……

(c) Which one of the atoms W, X and Z has the largest atomic radius?

……

4. The number of electrons, protons and neutrons in atoms A, B, C and D are shown in the table below.

Atom	Electrons	Protons	Neutrons
A	8	8	8
B	16	16	16
C	13	13	14
D	x	3	4

(a) Determine

(i) the value of x

……

(ii) the approximate relative atomic mass of C.

……

(b) Write the electronic configurations of the following atoms and ions.

(i) A^{2-}……..

(ii) A…….....

(iii) C……

(iv) C^{3+}…….....

(c) State two atoms that are of elements in the same group in the periodic table.

……

5. The atomic number of element Q is 13

(a) Write the electronic configuration of an atom of Q

……

(b) To which group in the Periodic Table does Q belong?

……

(c) State whether Q would conduct electricity or not.

……

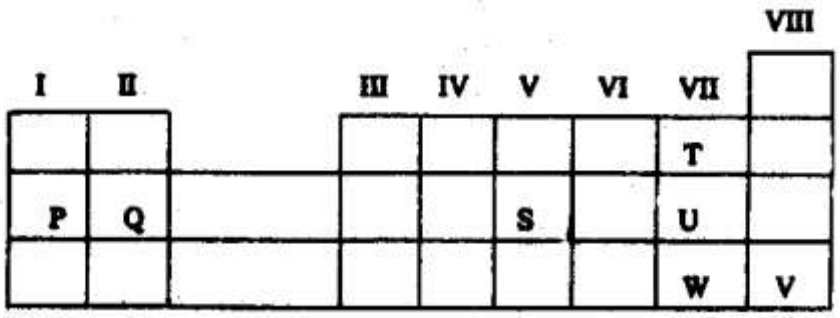
(d) (i) Write the formula of the oxide of Q.

……

(ii) State the type of bonding in the oxide of Q.

……

6. Part of the Periodic Table is shown below. The letters are not the usual symbols for elements.



(a) Which is the least reactive element?

……

(b) Which one of the elements, T, U and W reacts most vigorously with Q?

……

(c) Write the formula of the compound formed between Q and S.

……

(d) The compound formed between P and W was dissolved in water.
State whether resultant solution was acidic, basic or neutral.

……

(e) Which two elements represented in the table can react as reducing agents?

……

7. Element X and y with atomic numbers 12 and 8 respectively react to form a compound W.

(a) Write the electronic configuration of

(i) X ……

(ii) Y ……

(b) State whether W is

(i) a gas, liquid or solid at room temperature.

……

(ii) covalent or ionic

……

8. Part of the Periodic Table is shown below.

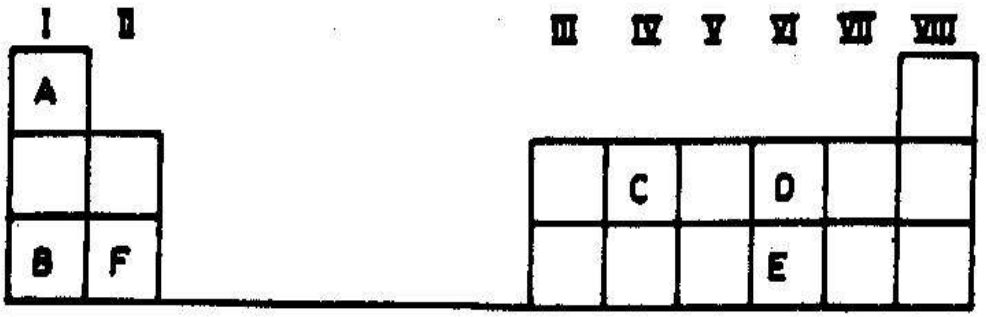


Fig. 3

(a) Write the formula of the compound formed between:

(i) D and C

……

(ii) E and F

……

(b) (i) Which one of the elements A and B reacts more vigorously with water?

……

(ii) Write an equation for the reaction between water and the element you have identified in (i).

……

……

9. Figure 1 shows part of the periodic table, The letters used are not the correct

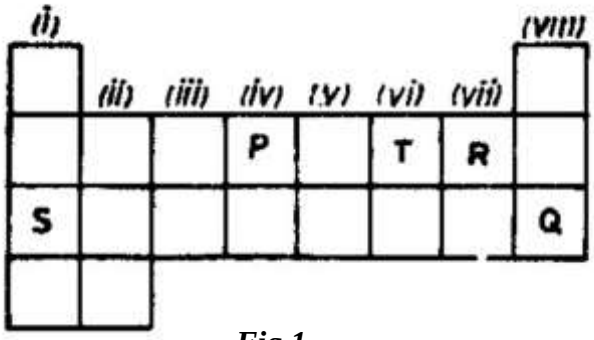


Fig 1

Which of the elements are metals?

……

(b) Suppose clement P reacts with element T,

(i) write the formula of the compound formed between P and T.

……

(ii) what would be the type of bond formed between P and T ?

……

(c) (i) Which element in the table is least reactive?

……

(ii) Explain your answer in c(i).

……

(d) (i) Suggest a compound formed between any two elements shown, which would conduct electricity.

……

(ii) Give a reason for your answer in d(i).

……

10. Figure 2 shows a set up of apparatus to investigate the reaction between metals and steam.

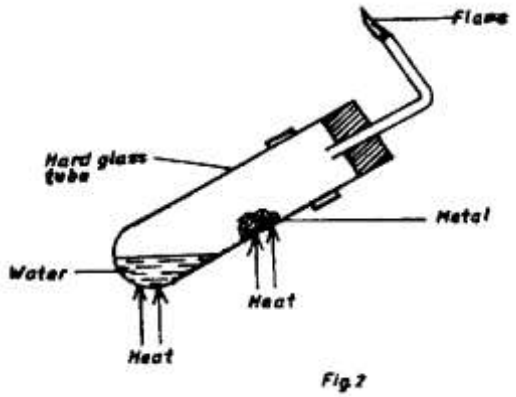


Fig.2

(a) Suggest a suitable metal that could be used in the experiment.

……

(b) (i) What would be observed in the glass tube ?

……

……

……

(ii) Write the equation for the reaction in the glass tube.

……

……

(c) (i) Suggest the gas that is being burnt at the end of the tube.

……

(ii) Write the equation for the combustion of the gas in c(i).

……

……

11. Use the data in the table below to answer the questions that follow.

Substance	M.P°C	B.P.°C	Solubility in water	Electrical conductance		Density at room temp.
				solid form	molten form	
A	714	1418	V	none	good	2.3g/cm^3
B	-95	*56*	V	none	none	0:8 g /cm^3
C	1083	2580	I	good	good	8.9 g/ cm^3
D	-101	-34	V	none	none	2.55g/cm^3
e	-23	77	I	none	none	1.6g/cm^3
F	-219	-11	S	*none*	none	1.33g/cm^3

V = very soluble; S = Slightly soluble; I - insoluble.

(a) (i) Name two substance that are liquid at room temperature.

……

……

(ii) Which of the two is more volatile?

……

(b) Which substances) would dissolve in water and could be separated from the solution by

(i) fractional distillation?

……

(ii) by evaporation of the water ?

……

(c) Which of the substances A to F,

(i) has a structure consisting of ions ?

……

(ii) is a metal ?

……

(i) is a liquid which would form separate layer with water?

(ii)

……

would the water be above or below ?

.....

(d) Which substance is a gas which

(i) would not be collected efficiently over water.

……

(ii) would be collected efficiently over water.

……

12. An atom X of an element, atomic mass 31 contains 15 protons.

(a) (i) State the number of neutrons in X.

……

(ii) Write the electronic configuration of X,

……

(b) State the group in the periodic table the element belongs.

……

(c) (i) Write the formula of a compound that can be formed between X and chlorine.

……

……

(ii) State the bond type in the compound in (c) (i).

……

(d) An atom Y contains 17 neutrons and 15 protons. What word is used to describe the relationship between X and Y ?

……

13 (a) Write the formulae of the oxides of:

(i) sulphur .....

(ii) aluminium.....

(b) State the type of bond that exists in the oxide of:

(i) sulphur.....

(ii) aluminium .....

(c) State the class to which the oxides of the following elements belong.

(i) sulphur.....

(ii) aluminium.....

14. An element M has electronic structure 2:8:8:2.

(a) State the group to which this element belongs in the periodic table.

……

(b) Element M was put in warm water.

(i) State what was observed.

……

……

(i) Write equation for the reaction that took place.

……

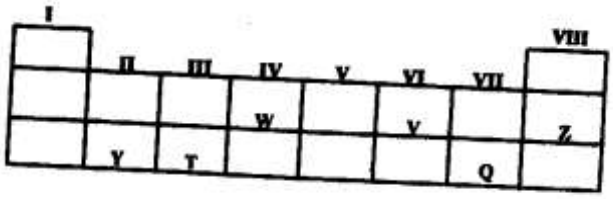
……

(c) Name one use of element M

……

……

15. Part of the Periodic Table is shown below. I



(a) State:

(i) the most reactive metal.....

(ii) the most reactive non-metal.....

(ii) the atom that forms the largest anion.

.....

(iv) the most non-reactive element

.....

(b) Write the formulae of the compounds formed between the following pairs of elements and in each case state the type of bonding.

(i) W and Q .....

(ii) T and V .....

16. Draw diagrams to show how the following elements use their outermost electrons to form the following compounds

[Atomic numbers: C = 6, O = 8, CI =17, Ca = 20]

(a) Carbon and hydrogen to form methane.

……

……

……

……

(b) Hydrogen and oxygen to form water.

……

……

……

……

(c) Calcium and chlorine to form calcium chloride.

……

……

……

……

17. Some elements in Period 3 of the Periodic Table are shown in the table below.

Group	I	II	III	IV	V	VI	VII	O
Element	E	Y			T	X	Q	Z

(a) Write the formula of the compound formed when

(i) T reacts with Q.

……

……

(ii) E reacts with X

……

……

(b) State the type of bonding:

(i) between the atoms of Y.

……

(ii) when X is reacted with oxygen.

……

18. (a) An element X is in Group II of the Periodic Table.

(i) State the type of bond that exists in the chloride of X.

……

(ii) Write the formula of the ion formed by X.

……

19. An atom of element X contains 15 electrons and 16 neutrons.

(a) (i) State the mass number of X.

……

(ii) Write the electronic structure of X.

……

(b) (i) Write the formula of a chloride of X.

……

(ii) State the type of bond that exists in the chloride of *X*

……

(c) Suggest how an aqueous solution of the oxide of X would affect litmus paper.

……

20. (a) The atomic numbers of the elements: M, X and Q are 6,11 ad 17 respectively.

(i) Explain what is meant by the term atomic number.
(ii) Write the electronic structures of Q, M and X.

(b) Q and combine with X to form a compound.

(i) Use valency electrons to explain briefly how the atoms Q and X form a compound.

(ii) Write the structural formula of the compound formed when Q combines with X.

(c) State two properties of the compounds formed between:

(i) M and Q.
(ii) Q and X.

END