01 **Given below is a table to answer the following questions.**

Elements	1	2	3	4	5	6	7	8
Atomic No.	8	12	13	16	17	18	30	26
Mass No.	16	24	27	32	37	38	65	56

Use only elements from the above table.

Write the answer in number only in the blank provided.

Detailed answer stating reasons must be written in the solution.

(a) **An unreactive element that can be filled in electric bulbs.**

(b) **An isotope of chlorine – 35.**

(c) **Exists in gaseous state and a diatomic molecule.**

(d) **Forms a cations with +3 charge.**

(e) **Forms an ionic compound with sodium of formula Na_2X (X - your chosen element).**

(f) **Forms an amphoteric oxide.**

(g) **Forms an acidic oxide.**

(h) **A non-transitional metal that forms colourless compounds.**

(i) **Is a transition metal that forms coloured compounds.**

(j) **Forms a basic oxide.**

(a) 6 – An unreactive element i.e., noble gas Argon (18) can be filled in electric bulbs.

(b) 5 – An isotope of chlorine is 17 with atomic mass 37. Isotopes of chlorine are 17 / 35 and 17 / 37.

(c) 5 – Gaseous chlorine (17) is a diatomic molecule (Cl_2).

(d) 3 – Aluminium (13) forms a cation with +3 charge.

(e) 4 – Oxygen (16) forms an ionic compound Na_2O with sodium (Na_2).

(f) 3 or 7 – Aluminium (13) (3) and zinc (30) (7) form amphoteric oxides.

(g) 5 – Chlorine (17), a non–metal forms an acidic oxide (ClO_2).

(h) 5 – A non-transitional metal (30) that forms colourless compounds is zinc.

(i) 8 – Iron (26), a transitional metal forms coloured compounds.

(j) 2 or 8 Magnesium (12)(2) and Iron (26)(8) being metals form basic oxides when they react with oxygen.

02 **The table given below shows the electronic configuration of six elements from P to U.**

Elements	Electronic configuration
P	2,1
Q	2,4
R	2,7
S	2,8,7
T	2,8,8
U	2,8,8,1

(a) Write the respective elements in the space provided.

(i) Which elements are in the same period of the Periodic Table ?

(ii) Which two elements are in the same group of the Periodic Table ?

(iii) Which element is a noble gas ?

(iv) Which one is a Group VII non-metal ?

(v) An element which forms a positive ion.

(b) (i) Give the formula of the compound formed between elements P and S.

(ii) What type of bonding would you expect in the compound formed ?

(a) (i) P, Q and R.

P - Li(2, 1), Q-C(2, 4) and R-F(2, 7) are the elements in the same period of the periodic table.

(ii) P and U.

Li(2, 1) and K(2, 8, 8, 1) are the two elements that belong to the same group in the periodic table.

(iii) T (Argon) (filled valence shell).

(iv) R – (2, 7) Fluorine; S – (2, 8, 7) Chlorine. Both with 7 valence electrons.

(v) P – (2, 1) Lithium; U – (2, 8, 8, 1) Potassium. Both of them form positive ions by losing an electron.

(b) (i) PS: P – (2, 1) Lithium; S – (2, 8, 7) Chlorine. Forms a compound Lithium chloride.

(ii) Ionic bonding: Bond formed is ionic.

03 **The atomic masses of three elements X, Y and Z having similar chemical properties are 7, 23 and 39 respectively.**

(a) **What is the average atomic mass of elements X and Z ?**

(b) **How does the average atomic mass of elements X and Z compare with the atomic mass of element Y ?**

(c) **Which law of classification of elements is illustrated by this example ?**

(d) **What could the elements X, Y and Z be ?**

(e) **Write another example of a set of elements which are classified according to the law in (c).**

(a) Atomic mass of element X = 7

Atomic mass of element Z = 39

46

Average atomic masses of elements X and Z

$= 7 + 39 = \frac{46}{2} = 23$

(b) The average atomic mass of elements X and Z is equal to the atomic mass of element Y

(c) Dobereiner's Law of Triads.

(d) X is lithium, Y is sodium, Z is potassium.

(e) Chlorine, Bromine, Iodine

04 **An element X from group 2 of the periodic table reacts with an element Y from group 17 to form a compound.**

(a) What is the nature of the compound formed ?

(b) Does the compound formed will conduct electricity or not.

(c) Write the formula of the compound formed.

(d) What is the valency of element X ?

(e) How many electrons are there in the outermost shell of an atom of element Y ?

(a) Ionic compound.

(b) Yes.

(c) XY_2.

(d) 2.

(e) 7.

05 **Sodium and chlorine are two elements from Period 3 of the Periodic Table.**

(a) How many electron shells are there in an atom of sodium?

(b) How many electrons are there in the valence shell of chlorine ?

(c) Which of these two atoms is a smaller atom ?

Explain your reasoning.

(d) (i) Give the formula of the compound formed when chlorine gas is passed over heated sodium.

(ii) What type of bond is formed in the above compound ?

(iii) How many electrons are transferred between these two atoms ?

(a) 3

(b) 7

(c) The chlorine atom is smaller than the sodium atom.

An atom of sodium has 11 protons wheareas an atom of chlorine has 17 protons.

The stronger nuclear attraction in the chlorine atom pulls its electron shells closer to the nucleus making it a smaller atom.

(d) (i) NaCl (ii) Ionic bond (iii) One electron