Chapter 5 Periodic Classification Of Elements

Very Short Answer Type Questions [1 Mark]

Question. Lithium, sodium and potassium form a Dobereiner's triad. The atomic masses of lithium and potassium are 7 and 39 respectively. Predict the atomic mass of sodium.

Answer.

$$\text{Atomic mass of Na} = \frac{7+39}{2} = \frac{46}{2} = 23$$

Question. Chlorine, bromine and iodine form a Dobereiner's triad. The atomic masses of chlorine and iodine are 35.5 and 126.9 respectively. Predict the atomic mass of bromine.

Answer.

$$\text{Atomic mass of Br} = \frac{35.5+126.9}{2} = \frac{162.4}{2} = 81.2$$

Question. Why was the system of classification of elements into triads not found suitable?

Answer. It is because all the elements discovered at that time could not be classified into triads.

Short Answer Type Questions [2 Marks]

Question. The elements of the second period of the Periodic Table are given below:
Li Be B C N O F
(a) Give reason to explain why atomic radii decrease from Li to F.
(b) Identify the most
(i) metallic and
(ii) non-metallic element.

Answer.
(a) It is because nuclear charge increases due to increase in atomic number, therefore, force of attraction between nucleus and valence electrons increases, i.e. effective nuclear charge increases, hence atomic radii decrease from Li to F.
(b) (i) Most metallic element is 'Li' as it
can lose electrons easily due to larger atomic size.
(ii) Most non-metallic element is 'F' because it can gain electrons easily due to smallest atomic size.

Question. The elements of the third period of the Periodic Table are given below:

Group	I	II	III	IV	V	VI	VII
Period 3	Na	Mg	Al	Si	P	S	Cl

(a) Which atom is bigger, Na or Mg? Why?
(6) Identify the most (i) metallic and (ii) non-metallic element in Period 3.

Answer. (a) Sodium is bigger than magnesium as it has lesser nuclear charge so there is less force of attraction between nucleus and valence electrons and less effective nuclear charge. It is, therefore, bigger in size.

(b) (i) Sodium is the most metallic as it can lose electrons easily due to its larger atomic size,
(ii) Chlorine is the most non-metallic element because it can gain electrons easily due to its smallest atomic size.

Question. State Mendeleev's periodic law. Write two achievements of Mendeleev's periodic table

Answer. Mendeleev's Periodic Law: 'Properties of elements are the periodic function of their atomic masses.
Achievements:

1. It could classify all the elements discovered at that time.
2. It helped in discovery of new elements.
3. It helped in correction of atomic mass of somd of the elements.

Question. How can the valency of an element be determined if its electronic configuration is known? What will be ` the valency of an element of atomic number 9 (nine)?

Answer. If the element has 1, 2, 3, 4 valence electrons, its valency will be 1, 2, 3, 4 respectively. If the element has 5, 6, 7, 8 valence electrons, its valency will be 3, 2, 1, 0. Element with atomic number 9 has electronic configuration 2, 7. So, its valency will be 1.

Question. How does the electronic configuration of an atom of an element relate to its position in the modern periodic table? Explain with one example.

Answer. The position of element depends upon number of valence electrons which depend upon electronic configuration. Those elements which have same valence electrons, occupy same group. Those elements which have one valence electron belong to group 1.
Elements with two valence electrons belong to group 2.
Period number is equal to number of shells.
If valence electrons are equal to 1, it belongs to group 1. If it has 2 shells, it belongs to second period, e.g. if element 'X' has atomic number 11, its electronic configuration is 2, 8,1. It has one valence electron, it belongs to group 1 and it has three shells therefore, it is in third period.

Question. The atomic numbers of three elements, X, Y and Z are 9,11 and 17 respectively. Which two of these elements will show similar chemical properties? Why?

Answer. Electronic configuration of X, Y and Z will be:
X(9) : 2, 7
Y(11) : 2, 8, 1
Z(17) : 2, 8, 7
X and Z will show similar chemical properties due to same number of valence electrons.

Question. On the basis of electronic configuration, how will you identify the first and the last element of a period?

Answer. First element has 1 valence electron and last element has 8 valence electrons. Number of shells remain the same in the same period.

Question. In the modern periodic table, the element Calcium (atomic number = 20) is surrounded by elements with atomic numbers 12, 19, 21 and 38. Which of these elements has physical and chemical properties resembling those of Calcium and why?

Answer. Elements with atomic number 12, 38 resemble calcium in physical and chemical properties because they have same number of valence electrons and belong to same group 2.
Mg(12) : 2, 8, 2
Ca(20) : 2, 8, 8, 2
Sr(38) : 2, 8, 18, 8, 2

Question. How does the metallic character of elements change along a period of the periodic table from the left to the right and why?

Answer. The metallic character goes on decreasing along a period from left to right because atomic size goes on decreasing therefore, tendency to lose electrons decreases.

Question. How does the valency of elements vary
(a) in going down a group, and
(b) in going from left to right in a period of the periodic table?

Answer. (a) Valency remains the same in a group.
(b) Valency first goes on increasing from left to right in a period till middle of period, then decreases.

Question. In the periodic table, how does the tendency of atoms to lose electrons change on going from

1. **left to right across a period?**
2. **top to bottom in a group?**

Answer.

1. Tendency to lose electrons decreases from left to right across a period.
2. Tendency to lose electrons increases from top to bottom in a group.

Question. Give reasons:

1. **Elements in a group have similar chemical properties.**
2. **Elements of Group I form ions with a charge of +1.**

Answer.

1. Elements in a group have same number of valence electrons and same valency therefore have similar chemical properties.
2. It is because elements of group 1 lose one electron to acquire +1 charge and become stable.

Question. An element 'X' has atomic number 13.
(a) Write its electronic configuration.
(b) State the group to which 'X' belongs.
(c) Is 'X' a metal or a non-metal?
(d) Write the formula of its bromide.

Answer.

(a) 2, 8, 3
(b) Group 13
(c) 'X' is a metal.
(d) X^{3+} Br^{1-} , XBr_3 is formula of its bromide.

Question. State the Modern Periodic Law for classification of elements. How many (a) groups and (b) periods are there in the Modern Periodic Table?

Answer. 'Properties of elements are the periodic function of their atomic number.'
(a) There are 18 groups and
(b) 7 periods in the Modern Periodic Table.

Question. An element 'M' has atomic number 11.
(a) Write its electronic configuration.
(b) State the group to which 'M' belongs.
(c) Is 'M' a metal or a non-metal?
(d) Write the formula of its chloride.

Answer.

(a) 2, 8, 1
(b) Group 1
(c) 'M' is a metal.
(d) $M^+ Cl^-$

MCl

MCl is formula of its chloride.

Question. the formula of its oxide An element 'M' has atomic number 12.
(a) Write its electronic configuration.
(b) State the group to which 'M' belongs.
(c) Is 'M' a metal or a non-metal?
(d) Write.

Answer.

(a) 2, 8, 2
(b) Group 2
(c) 'M' is a metal.
(d) $M^{2+} O^{2-}$, MO is formula of its oxide.

MO

Question. Choose from the following:
$6^{C,}$ $8^{O,}$ $10^{Ne,}$ $11^{Na,}$$14^{Si}$
(a) Elements that should be in the same period.
(b) Elements that should be in the same group.
State reason for your selection in each case.

Answer.

(a) $6^{C,}$ $8^{O,}$ 10^{Ne} are in same period, Le.
2nd period as they have two shells. nNa and 14Si are in same period, i.e. 3rd period as they have three shells.
(b)$6^{C,}$$14^{Si}$ are in same group because they have same number of valence electrons, i.e. four.

Question. An element 'X' belongs to 3rd period and group 17 of the periodic table. State its (a) electronic configuration, (b) valency. Justify your answer with reasoning.

Answer.

(a) X(17) : 2, 8, 7
(b) Valency : 1
It has atomic number 17 and therefore, electronic configuration will be 2, 8, 7. It can gain one electron to become stable therefore, its valency is equal to 1. It belongs to third period, as it has three shells. It belongs to group 17 because it has 7 valence electrons.

Question. The formula of magnesium oxide is MgO. State the formula of barium nitrate and barium sulphate, if barium belongs to the same group as magnesium.

Answer.

$Ba(NO_3)_2$ $\quad Ba^{2+}\ NO_3^-$ → $Ba(NO_3)_2$

$BaSO_4$ $\quad Ba^{2+}\ SO_4^{2-}$ → $BaSO_4$

Question. Choose from the following:
$_{20}Ca, _3Li, _{11}Na, _{10}Ne$
(a) An element having two shells completely filled with electrons.
(b) Two elements belonging to the same group of the periodic table.

Answer.
(a) $_{10}Ne$ has electronic configuration 2, 8. Its both shells are completely filled.
(b) $_3Li$ and nNa belong to same group of periodic table, ie. 1st group.

Question. Why do all the elements of the (a) same group have similar properties, (b) same period have different properties?

Answer.
(a) Elements of same group have similar properties due to same number of valence electrons, therefore, they have same valency.
(b) Elements of same period have different properties as they differ in number of valence electrons.

Question. An element 'E' has following electronic configuration:

K	L	M
2	8	6

(a) To which group of the periodic table does element 'E' belong?
(b) To which period of the periodic table does element 'E' belong?
(c) State the number of valence electrons present in element 'E'.
(d) State the valency of the element 'E'.

Answer.
(a) 'E' belongs to group 16.
(b) It belongs to 3rd period.
(c) It has 6 valence electrons.
(d) Its valency is equal to 2.

Question. Choose from the following:
$_4Be, _9F, _{19}K, _{20}Ca$
(a) The element having one electron in the outermost shell.
(b) Two elements of the same group.

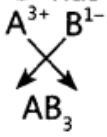
Answer.
(a) $_{19}K$ has one valence electron.
(b) $_4Be$ and $_{20}Ca$ belong to the same group.

Question. An element has atomic number 13.
(a) What is the group and period number to which this element belongs?
(b) Is this element a metal or a non- metal? Justify your answer.

Answer.
(a) It belongs to group 13 and 3rd period.
(b) It is a metal because it can lose 3 electrons to become stable.

Question. The electronic configuration of two elements 'A' and 'B' are 2, 8, 3 and 2, 8, 7 respectively. Find the atomic number of these elements. State the nature and formula of the compound formed by the union of these two elements.

Answer.
'A' has atomic number 13.
'B' has atomic number 17.



It is an ionic compound.

Question. The atomic number of three elements are given below:

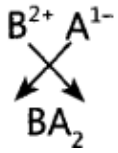
Element (symbol)	A	B	C
Atomic number	5	7	10

Write the symbol of the element which belongs to (o) group 13, (b) group 15, of the periodic table. State the period of the periodic table to which these elements belong. Give reason for your answer.

Answer.
(a) A belongs to group 13 because its electronic configuration is 2, 3, ie. it has 3 valence electrons.
(b) 'B' belongs to group 15 because its electronic configuration is 2, 5, ie. it has 5 valence electrons.
They belong to 2nd period as they ' both have two shells.

Question. Write the atomic number of these elements. What will be formula of the compound formed and the nature of bond between them when these two elements chemically combine together?

Answer.
'A' has atomic number 17. Its electronic configuration is 2, 8, 7. Its valency is equal to 1. number 20. Its electronic configuration is 2, 8, 8, 2. Its
'B' has atomic valency is 2.



Ionic bond will be formed.

Question. The atomic numbers of three elements are given below:

Element (symbol)	A	B	C
Atomic number	3	6	9

Write the symbol of the element which belongs to (a) group 1, (b) group 14, of the

periodic table. State the period of the periodic table to which these elements belong. State reason to support your answer.

Answer.
(a) A belongs to group 1.
(b) B belongs to group 14.
These elements belong to second period because these elements have two shells. A has electronic configuration 2, 1 and has one valence electron so, belongs to group 1. 'B' has electronic configuration 2, 4 and has four valence electrons so, belongs to group 14 and period 2. 'C' has electronic configuration 2, 7 and has one valence electron. All of them contain two shells and so belong to second period.

Short Answer Type Questions [3 Marks]

Question. The position of three elements A, B and C in the Periodic Table is shown below:

Group 16	Group 17
–	–
–	A
–	–
B	C

Giving reasons, explain the following:
(a) Element A is a non-metal.
(b) Element B has a larger atomic size than element C.
(c) Element C has a valency of 1

Answer. (a) 'A' is non-metal because it can gain electron easily as it has 7 valence electrons and forms negative ion with stable electronic configuration.
(b) It is because 'B' has lesser atomic number, less nuclear charge, less force of attraction between valence electrons and nucleus therefore, has larger atomic size.
(c) 'C' has 7 valence electrons. It can gain one electron to become stable. So, its valency is equal to one.

Question. The position of three elements A, B and C in the Periodic Table is shown below:

Group / Period	1	2	13	14	15	16	17
1	B						
2							A
3						C	

Giving reasons, explain the following:
(a) Element A is non-metal.
(b) Atom of element C has a larger size ` than atom of element A.
(c) Element B has a valency of 1.

Answer. (a) It is because it has 7 valence electrons.
It can gain one electron to form negative ion. So, it is a non-metal.
(b)'C' has more number of shells than A. So, it is larger in size.

(c)'B' has one valence electron. It can lose one electron to become stable. So, its valency is equal to 1.

Question. What physical and chemical properties of elements were used by Mendeleev in creating his periodic table? List two observations which posed a challenge to Mendeleev's Periodic Law.

Answer. Atomic mass as a physical property and nature and formulae of oxide and hydride formed, and chemical property was used by Mendeleev.
Following are the two observations which posed a challenge to Mendeleev's Periodic Law.
(i) Increasing order of atomic weights could not be maintained while matching chemical properties. Chemical properties do not depend upon atomic mass.
(ii) Isotopes have different atomic mass but same chemical properties.

Question. Table given below shows a part of the Periodic Table.

H							He
Li	Be	B	C	N	O	F	Ne
Na	Mg	Al	Si	P	S	Cl	Ar

(b) Atomic size of Mg is less than that of Na.
(c) Fluorine is more reactive than Chlorine.

Answer.
(a) They can lose electrons easily due to bigger size; energy required to remove electron is less.
(b) It is because of greater effective nuclear charge on Mg, i.e. more number of protons attract more number of electrons than Na.
(c) 'F' can form F^- more easily than Cl due to smaller atomic size. F^- is more stable than Cl^-. Therefore, fluorine is more reactive than chlorine.

Question. (a) Why do we classify elements?
(b) What were the two criteria used by Mendeleev in creating his Periodic Table?
(c) Why did Mendeleev leave some gaps in his Periodic Table?
(d) In Mendeleev's Periodic Table, why was there no mention of Noble gases like Helium, Neon and Argon?
(e) Would you place the two isotopes ' of chlorine, CI-35 and CI-37 in different slots because of their different atomic masses or in the same slot because their chemical properties are the same? Justify your answer.

Answer.
(a) It is done so as to study the properties of elements conveniently.
(b) Increasing order of atomic mass and similarities in chemical properties (especially nature and formulae of oxide and hydride formed).
(c) These gaps were left for undiscovered elements.
(d) Noble gases were not invented at that time.
(e) They will be kept at same slot as they have same chemical properties.

Question. (a) What is meant by periodicity in properties of elements with reference to the periodic table?
(b) Why do all the elements of the same group have similar properties?
(c) How will the tendency to gain electrons change as we go from left to right across a period? Why?

Answer.
(a) The repetition of same properties after definite interval is called periodicity in properties.
(b) It is because they have same valence electrons therefore, have similar properties.
(c) Tendency to gain electrons increases from left to right in a period because atomic size goes on decreasing and effective nuclear charge increases.

Question. (a) What are 'groups' and 'periods' in the 'periodic table'?
(b) Two elements M and N belong to group I and II respectively and are in the same period of the periodic table. How do the following properties of M and N vary?

1. **Sizes of their atoms**
2. **Their metallic characters**
3. **Their valencies in forming oxides**
4. **Molecular formulae of their chlorides**

Answer.
(a) The vertical columns in the periodic table are called 'groups'. The horizontal rows in the periodic table are called 'periods'.
(b)

1. 'M' and 'N' belong to same period but group I and II. Therefore, 'N' will be smaller than 'M' as atomic size goes on decreasing from left to right.
2. 'M' is more metallic than 'N'. Metallic character goes on decreasing from left to right as tendency to lose electrons decreases due to decrease in atomic size.
3. Their valencies are 1 and 2 respectively in forming oxides. Valency goes on increasing first and then decreases.
4. MCI, NCI2 are molecular formulae of their chlorides.

Question. Atoms of seven elements A, B, C, D, E, F and G have a different number of electronic shells but have the same number of electrons in their outermost shells. The elements A and C combine with chlorine to form an acid and common salt respectively. The oxide of element A is liquid at room temperature and is a neutral substance, while the oxides of the remaining six elements are basic in nature. Based on the above information, answer the following questions: What could the element A be?
(i) Will elements A to G belong to the same period or same group of the periodic table?
(iii) Write the formula of the compound formed by the reaction of the element A with oxygen,
(iv)Show the formation of the compound by a combination of element C with chlorine with the help of electronic structure.
(v) What would be the ratio of number of combining atoms in a compound formed by the combination of element A with carbon?
(vi)Which one of the given elements is likely to have the smallest atomic radius?

Answer.
(i)'A' is hydrogen because its oxide H_2O is liquid at room temperature .
(ii)A to G belong to same group of the periodic table as these have same number of valence electrons.

(iii) A_2O

(iv) $(C^{\times})$ $(\dot{\underset{\cdot\cdot}{C}}l:)$

$(C)^{+}(Cl)^{-}$

(v) A^1 C^4 A_4C, *i.e.* 4 : 1

A_4C

(vi) 'A' has smallest atomic size.

Question. In the following table, six elements A, B, C, D, E and F (here letters are not the usual symbols of the elements) of the Modern Periodic Table with atomic numbers 3 to 18 are given:

3	4	5	6	7	8	9	10
A					E		G
11	12	13	14	15	16	17	18
B	C		D			F	

(a) Which of these halogen ?is (i) a noble gas, (ii) a halogen
(b) If B combines with F, what would be the formula of the compound formed?
(c)Write the electronic configurations of C and E.

Answer.

(*a*) (*i*) G is a noble gas.
(*ii*) F is a halogen.

(*b*) BF will be the formula of the compound formed.

(*c*) C has atomic number 12 and electronic configuration is K = 2, L = 8, M = 2.
E has atomic number 8 and electronic configuration is K = 2, L = 6.

Question. In the following table, are given eight elements A, B, C, D, E, F, G and H (here letters are not the usual symbols of the elements) of the Modern Periodic Table with the atomic numbers of the elements in parenthesis.

Period	Group 1	Group 2
2	A (3)	E (4)
3	B (11)	F (12)
4	C (19)	G (20)
5	D (37)	H (38)

1. **What is the electronic configuration of F?**
2. **What is the number of valence electrons in the atom of F?**
3. **What is the number of shells in the atom of F?**
4. **Write the size of the atoms of E, F, G and H in decreasing order,**
5. **State whether F is a metal or a non-metal.**
6. **Out of the three elements B, E and F, which one has the biggest atomic size?**

Answer.

1. F has electronic configuration 2, 8, 2.
2. F has 2 valence electrons.
3. There are three shells in 'F'.
4. H > G > F > E is decreasing order of size of atbms.
5. 'F' is a metal.
6. 'B' is having biggest atomic size among B, E and F.

Question. F, Cl and Br are the elements each having seven valence electrons. Which of these (a) has the largest atomic radius, (b) is most reactive? Justify your answer stating reason for each.
Answer.
(a) Bromine has largest atomic radius because it has four shells: 2, 8, 18, 7.
(b) Fluorine is most reactive because it is smallest in size and can gain electron easily.

Question. Na, Mg and Al are the elements having one, two and three valence electrons respectively. Which of these elements (a) has the largest atomic radius, (b) is least reactive? Justify your answer stating reason for each.
Answer. (a) Na has the largest atomic radius because it has 11 protons and 11 electrons, therefore least effective nuclear charge.
(b) Al is least reactive because it has smallest atomic size due to 13 protons and 13 electrons, it has greater effective nuclear charge, therefore, cannot lose electrons easily, hence it is least reactive.

Question. (a) How are the following related?

1. **Number of valence electrons of different elements in the same group.**
2. **Number of shells of elements in the same period.**

(b) How do the following change?

1. **Number of shells of elements as we go down a group.**
2. **Number of valence electrons of elements on moving from , left to right in a period.**
3. **Atomic radius in moving from left to right along a period.**
4. **Atomic size down a group.**

Answer.
(a)

1. Different elements in same group have same number of valence electrons.
2. Number of shells of elements in same period are equal.

(b)

1. Number of shells of elements goes on increasing down the group.
2. Number of valence electrons of elements goes on increasing on moving from left to right in a period, e.g. lithium has 1, beryllium has 2, boron has 3, carbon has 4, nitrogen has 5, oxygen has 6, fluorine has 7 and neon has 8 valence electrons.
3. Atomic radius goes on decreasing in moving from left to right along a period.
4. Atomic size goes on increasing down a group.

Question. (a) How many periods are there in the Modern Periodic Table of elements?
(b) How do atomic radius, valency and metallic character vary down a group?
(c) How do the atomic size and metallic character of elements vary as we move from left to right in a period?

Answer.
(a) There are 7 periods.
(b) Atomic radius goes on increasing down the group, valency remains same. Metallic character increases down the group.
(c) Atomic size decreases along a period from left to right. Metallic character decreases along a period from left to right.

Long Answer Type Questions [5 Marks]

Question. (a) Which two criteria did Mendeleev use to classify the elements in his Periodic Table?
(b) State Mendeleev's periodic law.
(c) Why could no fixed position be given to hydrogen in Mendeleev's Periodic Table?
(i) Sizes of their atoms
(ii) Their metallic characters
(iii) Their valencies in forming oxides

(iv) Molecular formulae of their chlorides
(a) The vertical columns in the periodic table are called 'groups'. The horizontal rows in the periodic table are called 'periods'.
(b) (i) 'M' and 'N' belong to same
period but group I and II. Therefore, 'N' will be smaller than 'M' as atomic size goes on decreasing from left to right.
(ii) 'M' is more metallic than 'N'. Metallic character goes on decreasing from left to right as tendency to lose electrons decreases due to decrease in atomic size.
(iii) Their valencies are 1 and 2 respectively in forming oxides. Valency goes on increasing first
and then decreases.
(iv) MCI, NCI2 are molecular formulae of their chlorides.
(d) How and why does the atomic size vary as you go
(i) from left to right along a period?
(ii) down a group?

Answer.
(a) (i) Increasing order of atomic mass as physical property and similarities in chemical properties of elements.
(ii) The formulae and nature of hydrides and oxides formed by elements was treated as basic chemical property for its classification.
(b) Properties of elements are the periodic functions of their atomic masses.
(c) It is because it resembles both alkali metals as well as halogens.
(d) (i) Atomic size goes on decreasing
from left to right because one proton and one electron is being added successively therefore, force of attraction between . valence electrons and nucleus increases hence, the atomic size decreases.
(ii) The atomic size goes on increasing from top to bottom in a group because number of shells keep on increasing therefore, distance between nucleus and valence electrons increases.

Question.15 (a) did Mendeleev have gaps in his periodic table?
(b) any three limitations of Mendeleev's classification.
(c) does electronic configurations of atoms change in a period with increase in atomic number?

Answer. (a)Gaps were left for undiscovered elements in the Mendeleev's Periodic Table.
(b)(i) Position of hydrogen was not justified.
(ii)Increasing order of atomic mass could not be maintained.
(iii) Isotopes have similar chemical properties but different atomic masses, they cannot be given separate places.
(c)Number of shells remains the same, number of valence electrons goes on increasing
from left to right in a period till octet is comilete,e.g.

Li	Be	B	C	N	O	F	Ne
2, 1	2, 2	2, 3	2, 4	2, 5	2, 6	2, 7	2, 8

Question. Atoms of eight elements A, B, C, D, E, F, G and H have the same number of electronic shells but different number of electrons in their outermost shell. It was found that elements A and G combine to form an ionic compound. This compound is added in a small amount to almost all vegetable dishes during cooking. Oxides of elements A and B are basic in nature while those of E and F are acidic. The oxide of D is almost neutral. Based on the above information answer the following questions:

1. **To which group or period of the Periodic Table do the listed elements belong?**
2. **What would be the nature of compound formed by a combination of elements B and F?**
3. **Which two of these elements could definitely be metals?**
4. **Which one of the eight elements is most likely to be found in gaseous state at room temperature?**

5. **If the number of electrons in the outermost shell of elements C and G be 3 and 7 respectively, write the formula of the compound formed by the combination of C and G.**

Answer.

1. A and B belong to group 1 and 2 because they form basic oxides. C belongs to group 13 as it has 3 valence electrons. D belongs to group 14 as it forms almost neutral oxide. E and F belong to group 15 and 16 as they form acidic oxides, G belongs to group 17 as it has 7 valence electrons and H belongs to group 18. They belong to 3rd period of the Periodic Table because AG is NaCI, added in a small amount to almost all vegetable dishes during cooking and Na and Cl belong to 3rd period.
2. Ionic compounds will be formed because 'B' is metal and 'F' is non-metal. 'B' can lose two electrons and 'F' can gain two electrons.
3. A and B are definitely metals as they form basic oxides.
4. G and H are gaseous at room temperature.
5. CG3 is the formula of the compound formed by combination of C and G.

Question. Atoms of eight elements A, B, C, D, E, F, G and H have the same number of electronic shells but different number of electrons in their outermost shells. It was found that elements A and G combine to form an ionic compound which can also be extracted from sea water. Oxides of the elements A and B are basic in nature while those of E and F are acidic. The oxide of element D is almost neutral. Answer the following questions based on the information given herein:

1. **To which group or period of the periodic table do the listed elements belong?**
2. **Which one of the eight elements is likely to be a noble gas?**
3. **Which one of the eight elements would have the largest atomic radius?**
4. **Which two elements amongst these are likely to be non¬metals?**
5. **Which one of these eight elements is likely to be a semi-metal or metalloid?**

Answer.

1. A and B belong to group 1 and 2 because they form basic oxides. C belongs to group 13 as it has 3 valence electrons. D belongs to group 14 as it forms almost neutral oxide. E and F belong to group 15 – and 16 as they form acidic oxides, G belongs to group 17 as it has 7 valence electrons and H belongs to group 18. They belong to 3rd period of Periodic Table because sodium belongs to 3rd period and AG is NaCI, ionic compound of sodium which can be obtained from sea water and A(Na) and G(CI) belong to 3rd period.
2. H belongs to noble gas.
3. A has the largest atomic radius.
4. E and F are likely to be non¬metals.
5. D is likely to be metalloid or semi-metal.