CHEMISTRY-2

Classification of Elements and Periodicity in Properties

[Set-2]

SECTION-A

1. The highest electron enthalpy is shown by

   (i) O^- (ii) F^- (iii) Li^- (iv) Be

2. Which electronic configuration of an element has abnormally high difference between second and third ionization enthalpy?

   (i) $1s^2\ 2s^2\ 2p^6\ 3s^1$ (ii) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^1$ (iii) $1s^2\ 2s^2\ 2p^6$ (iv) $1s^2\ 2s\ 2p^6\ 3s^2$

3. For Na^+, Mg^{2+}, F^- and O^{2-}, the correct order of increasing ionic size is

   (i) $Na^+ < Mg^{2+} < O^{2-} > F-$ (ii) $Mg^{2+} < Na^+ < O^{2-} < F^-$

   (iii) $Mg^{2+} < Na^+ < F^- < O^{2-}$ (iv) $O^{2-} < F^- < Na^+ < Mg^{2+}$

4. In B, Al, Ga, In and Tl, the second highest ionization enthalpy is associated with

   (i) B (ii) Ga (iii) Al (iv) Tl

5. **Match the following:**

	Column-I (element)		**Column-II (Properties)**
A:	F	1.	Highest Δ_iH
B:	Cl	2.	Most electropositive
C.	He	3.	Most electronegative
D.	Cs	4.	Most negative $\Delta_{eg}H$

	A	B	C	D
(i)	3	3	1	2
(ii)	3	4	2	1
(iii)	4	3	1	2
(iv)	3	4	1	2

Assertion-Reason type Questions:

(a) Both A and R are true and R is the correct explanation of A

(b) Both A and R are true and R is not the correct explanation of A

(c) A is true but R is false

(d) A is false but R is true

6. A: First ionisation enthalpy of nitrogen is lower than that of oxygen

   R: Across a period, effective nuclear charge increases

7. A: Metallic character increases down the group.

   R: Down the group, atomic size increases

Passage based question:

Periodic properties show a regular gradation in a group as well as in period.

Atomic size/ionic size, electropositivity, metallic character increases down the group and decreases across the period. Ionization enthalpy, electronegativity, electron affinity increases across the period and decreases down the group. Noble gases have a very high ionization enthalpies and positive electron gain enthalpy.

8. The electronic configuration with highest Δ_iH is

   (i) [Ne] $3s^2 3p^2$ (i) [Ne] $3s^2 3p^3$ (iii) [Ne] $3s^2$ $3p^1$ (iv) [Ar]$3d^{10}$ $4s^2$ $4p^3$

9. The most metallic element is

   (i) Li (ii) Ca (iii) Al (iv) Zn

10. The element with most negative electron gain enthalpy is

    (i) [He]$2s^2 2p^3$ (ii) [He]$2s^2 p^5$ (iii) [He]$2s^2 2p^4$ (iv) [Ne] $3s^2$ $3p^5$

SECTION-B

11. Write the symbol and IUPAC names of the elements with atomic number

    (i) Z = 120 (ii) Z = 117

12. Account for the following:

    (i) Be and Mg have positive electron gain enthalpies

    (ii) Oxygen has a less negative electron gain enthalpy than sulphur in group 16.

OR

Give reason:

(i) Na^+ is smaller in size than Na whereas Cl^- is larger in size than Cl.

(ii) Boron has a higher first ionization enthalpy than aluminium.

13. Give three points to distinguish between electron gain enthalpy and electronegativity.

14. Write the general electronic configuration of s-, p and d-block elements. How many groups are present in each of these blocks?

OR

Assign the position of the element having outer electronic configuration.

(i) $ns^2 np^4$ for n = 3 (ii) $(n-1)d^2 ns^2$ for n = 4 (iii) $(n-2)f^7 (n-1)d^1 ns^2$ for n = 6

15. (i) The increasing order of reactivity among group 1 elements is Li < Na < K < Rb < Cs whereas that of group 17 is F > Cl > Br > I. Explain

(ii) What are the factors due to which the ionization enthalpy increases along the period?

OR

(i) Arrange the element N, P, O and S in the order of

(a) increasing first ionization enthalpy

(b) increasing non-metallic character

(c) increasing electron gain enthalpy

(ii) p-block elements form acidic, basic and amphoteric oxides. Explain each property by giving two examples

