Q1 (20 July 2021 Shift 1)

The set in which compounds have different nature is:

(1) $B(OH)_3$ and H_3PO_3

(2) $B(OH)_3$ and $Al(OH)_3$

(3) NaOH and $Ca(OH)_2$

(4) $Be(OH)_2$ and $Al(OH)_3$

Q2 (22 July 2021 Shift 1)

Which one of the following statements for D.I. Mendeleeff, is incorrect?

(1) He authored the textbook – Principles of Chemistry.

(2) At the time, he proposed Periodic Table of elements structure of atom was known.

(3) Element with atomic number 101 is named after him.

(4) He invented accurate barometer.

Q3 (25 July 2021 Shift 1)

The ionic radii of K^+, Na^+, Al^{3+} and Mg^{2+} are in the order :

(1) $Na^+ < K^+ < Mg^{2+} < Al^{3+}$

(2) $Al^{3+} < Mg^{2+} < K^+ < Na^+$

(3) $Al^{3+} < Mg^{2+} < Na^+ < K$

(4) $K^+ < Al^{3+} < Mg^{2+} < Na$

Q4 (25 July 2021 Shift 2)

The ionic radii of F^- and O^{2-} respectively are 1.33 A and 1.4Ã . . ., while the covalent radius of N is 0.74Ã . . .

The correct statement for the ionic radius of N^{3-} from the following is:

(1) It is smaller than F^- and N

(2) It is bigger than O^{2-} and F^-

(3) It is bigger than F^- and N, but smaller than of O^{2-}

(4) It is smaller than O^{2-} and F^-, but bigger than of N

Q5 (27 July 2021 Shift 1)

Match List - I with List - II :

List - I	List - II
(a) NaOH	(i) Acidic
(b) $Be(OH)_2$	(ii) Basic
(c) $Ca(OH)_2$	(iii) Amphoteric
(d) $B(OH)_3$	
(e) $Al(OH)_3$	

Choose the most appropriate answer from the options given below

(1) (a)-(ii),(b)-(ii),(c)-(iii),(d)-(ii),(e)-(iii)

(2) (a)-(ii), (b)-(iii), (c)-(ii), (d)-(i), (e)-(iii)

(3) (a)-(ii), (b)-(ii), (c)-(iii), (d)-(i), (e)-(iii)

(4) (a)-(ii), (b)-(i), (c)-(ii), (d)-(iii), (e)-(iii)

Q6 (27 July 2021 Shift 2)

The CORRECT order of first ionisation enthalpy is :

(1) $Mg < S < Al < P$

(2) $Mg < Al < S < P$

(3) $Al < Mg < S < P$

(4) $Mg < Al < P < S$

Answer Key

Q1 (2) **Q2** (2) **Q3** (3) **Q4** (2)

Q5 (2) **Q6** (1)

Q1

(1) $B(OH)_3$ acidic and H_3PO_3 acidic

(2) $B(OH)_3$ acidic and $Al(OH)_3$ amphoteric

(3) NaOH basic and $Ca(OH)_2$ basic

(4) $Be(OH)_2$ amphoteric and $Al(OH)_3$ amphoteric

Q2

At the time, he proposed the periodic table but structure of atom was unknown.

Q3

Al^{3+}, Mg^{2+} and Na^+ are isoelectronic ionic species. For monoatomic ionic isoelectronic species as positive charge increases ionic size decreases. The order of size of Na^+ \& K^+ is $Na^+ < K^+$,

$\therefore$ order of ionic radii is : $Al^{3+} < Mg^{2+} < Na^+ < K^+$

Q4

F^-, O^{2-} and N^{3-} all are isoelectronic species in which N^{3-} have least number of protons due to which it's size increases as least nuclear attraction
is experienced by the outer shell electrons. Size order $N^{3-} > O^{2-} > F^-$

Q5

$NaOH \rightarrow$ Basic

$Be(OH)_2 \rightarrow$ Amphoteric

$Ca(OH)_2 \rightarrow$ Basic

$B(OH)_3 \rightarrow$ Acidic

$Al(OH)_3 \rightarrow$ Amphoteric

Q6

$MgAl \quad P \quad S \rightarrow$ IE. order $\Rightarrow Al < Mg < S < P$

Valence $[N_e] : 3\,s^M 3\,s^2 3p^1 3\,s^P 3p^3 3\,s^s 3p^4$

↑

Full

Filled

Stable Half Filled Fillec 1