Q1 - 25 July - Shift 1

Choose the correct order of density of the alkali metals :

(A) Li < K < Na < Rb < Cs

(B) Li < Na < K < Rb < Cs

(C) Cs < Rb < K < Na < Li

(D) Li < Na < K < Cs < Rb

Space for your notes:

Q2 - 25 July - Shift 2

The correct order of density is

(A) Be > Mg > Ca > Sr

(B) Sr > Ca > Mg > Be

(C) Sr > Be > Mg > Ca

(D) Be > Sr > Mg > Ca

Space for your notes:

Q3 - 26 July - Shift 1

Which of the following can be used to prevent the decomposition of H_2O_2?

(A) Urea

(B) Formaldehyde

(C) Formic acid

(D) Ethanol

Space for your notes:

Q4 - 26 July - Shift 2

Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : LiF is sparingly soluble in water.

Reason R : The ionic radius of Li^+ ion is smallest among its group members, hence has least hydration enthalpy.

In the light of the above statements, choose the most appropriate answer from the options given below .

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

(B) Both A and R are true but R is NOT the correct explanation of A

(C) A is true but R is false

(D) A is false but R is true

Space for your notes:

Q5 - 27 July - Shift 2

An element A of group 1 shows similarity to an element B belonging to group 2. If A has maximum hydration enthalpy in group 1 then B is:

(A) Mg (B) Be

(C) Ca (D) Sr

Space for your notes:

Q6 - 28 July - Shift 1

Which of the following statement is incorrect ?

(A) Low solubility of LiF in water is due to its small hydration enthalpy.

(B) KO_2 is paramagnetic.

(C) Solution of sodium in liquid ammonia is conducting in nature.

(D) Sodium metal has higher density than potassium metal

Space for your notes:

Q7 - 28 July - Shift 2

The products obtained during treatment of hard water using Clark's method are:

(A) $CaCO_3$ and $MgCO_3$

(B) $Ca(OH)_2$ and $Mg(OH)_2$

(C) $CaCO_3$ and $Mg(OH)_2$

(D) $Ca(OH)_2$ and $MgCO_3$

Space for your notes:

Q8 - 28 July - Shift 2

Statement I: An alloy of lithium and magnesium is used to make aircraft plates.

Statement II : The magnesium ions are important for cell-membrane integrity.

In the light the above statements, choose the *correct* answer from the options given below

(A) Both Statement I and Statement II are true

(B) Both Statement I and Statement II are false

(C) Statement I is true but Statement II is false

(D) Statement I is false but Statement II is true

Space for your notes:

Q9 - 29 July - Shift 1

Lithium nitrate and sodium nitrate, when heated separately, respectively, give :

(A) $LiNO_2$ and $NaNO_2$

(B) Li_2O and Na_2O

(C) Li_2O and $NaNO_2$

(D) $LiNO_2$ and Na_2O

Space for your notes:

Q10 - 29 July - Shift 2

Portland cement contains 'X' to enhance the setting time. What is 'X'?

(A) $CaSO_4.\frac{1}{2}H_2O$ (B) $CaSO_4.2H_2O$

(C) $CaSO_4$ (D) $CaCO_3$

Space for your notes:

Answer Key

Q1 (A) **Q2** (C) **Q3** (A) **Q4** (C)

Q5 (A) **Q6** (A) **Q7** (C) **Q8** (B)

Q9 (C) **Q10** (B)

Q1 (A)

Factual

Q2 (C)

In II'A' group density decreases down the group till Ca and after that it increases.
Correct order of density is
Sr > Be > Mg > Ca

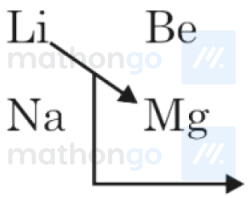
Q3 (A)

Urea acts as stabiliser for H_2O_2.

Q4 (C)

Due to high lattice energy LiF is sparingly soluble in water. Li^+ has high hydration energy among its group members due to smallest size.

Q5 (A)



Diagonal relationship

$Li^+ \rightarrow$ Maximum hydration enthalpy in group 1 due to small size.
So 'B' is Mg.

Q6 (A)

Low solubility of LiF in water is due to high lattice enthalpy

Q7 (C)

In Clark's method lime water is used

$$Ca(HCO_3)_2 + 2Ca(OH)_2 \rightarrow 2CaCO_3 + 2H_2O$$

$$Mg(HCO_3)_2 + 2Ca(OH)_2 \rightarrow 2CaCO_3 + Mg(OH)_2 + 2H_2O$$

Q8 (B)

Alloy of Li and Mg is used to make armour plates and not aircraft plates.

Calcium plays important roles in neuromuscular function, interneuronal transmission and cell membrane integrity

Q9 (C)

Li_2O, $NaNO_2$

As per NCERT Lithium nitrate when heated gives lithium oxide, Li_2O, whereas other alkali metal nitrates decompose to give the corresponding nitrite.

$$4LiNO_3 \longrightarrow 2Li_2O + 4NO_2 + O_2$$

$$2NaNO_3 \longrightarrow 2NaNO_2 + O_2$$

However, the decomposition product of $NaNO_3$ are temperature dependent process as shown in the below reaction.

$$NaNO_3 \xrightarrow[500°C]{\Delta} NaNO_2\,(s) + \frac{1}{2}O_2\,(g)$$

$$\downarrow \Delta\ 800°C$$

$$Na_2O\,(s) + N_2(g) + O_2\,(g)$$

As temperature is not mentioned, we can go by

Q10 (B)

Gypsum ($CaSO_4.2H_2O$) is used to enhance setting time in portland cement.