AIPMT-2010

1. Compound A on heating gives a colourless gas and a residue that is dissolved in water to obtain B. Excess of CO_2 is bubbled through aqueous solution of B, C is formed which is recovered in the solid form. Solid C on gentle heating gives back A. The compound is :-

(1) Na_2CO_3 (2) K_2CO_3

(3) $CaSO_4.2H_2O$ (4) $CaCO_3$

AIPMT Mains-2011

2. Which of the following statements is incorrect :-

(1) $NaHCO_3$ on heating gives Na_2CO_3

(2) Pure sodium metal dissolves in liquid ammonia to give blue solution

(3) NaOH reacts with glass to give sodium silicate

(4) Aluminium reacts with excess NaOH to give $Al(OH)_3$

NEET-II 2016

3. The suspension of slaked lime in water is known as

(1) milk of lime

(2) aqueous solution of slaked lime

(3) limewater

(4) quicklime

4. In context with beryllium, which one of the following statements is **incorrect** ?

(1) Its salts rarely hydrolyze.

(2) Its hydride is electron-deficient and polymeric.

(3) It is rendered passive by nitric acid.

(4) it forms Be_2C.

NEET(UG) 2019 (ODISHA)

5. Crude sodium chloride obtained by crystallisation of brine solution does not contain

(1) $MgSO_4$ (2) Na_2SO_4

(3) $MgCl_2$ (4) $CaSO_4$

6. Which of the alkali metal chloride (MCl) forms its dihyrate salt ($MCl.2H_2O$) easily ?

(1) LiCl (2) CsCl (3) RbCl (4) KCl

NEET(UG) 2020

7. HCl was passed through a solution of $CaCl_2$, $MgCl_2$ and NaCl. Which of the following compound(s) crystallise(s) ?

(1) NaCl, $MgCl_2$ and $CaCl_2$

(2) Both $MgCl_2$ and $CaCl_2$

(3) Only NaCl

(4) Only $MgCl_2$

8. The following metal ion activates many enzymes, participates in the oxidation of glucose to produdce ATP and with Na, is responsible for the transmission of nerve signals.

(1) Potassium (2) Iron

(3) Copper (4) Calcium

NEET(UG) 2020(COVID-19)

9. Identify the correct statement from the following.

(1) The order of hydration enthalpies of alkaline earth cations
$Be^{2+} < Mg^{2+} < Ca^{2+} < Sr^{2+} < Ba^{2+}$

(2) Lithium and Magnesium show some similarities in their physical properties as they are diagonally placed in periodic table.

(3) Lithium is softer among all alkali metals.

(4) Lithium chloride is deliquescent and crystallises as a hydrate, $LiCl \cdot H_2O$.

10. What is the role of gypsum, $CaSO_4.2H_2O$ in setting of cement ? Identify the correct option from the following :

(1) to fasten the setting process

(2) to provide water molecules for hydration process

(3) to help to remove water molecules

(4) to slow down the setting process

NEET(UG) 2021

11. Among the following alkaline earth metal halides, one which is covalent and soluble in organic solvents is:
(1) Calcium chloride
(2) Strontium chloride
(3) Magnesium chloride
(4) Beryllium chloride

12. The structures of beryllium chloride in solid state and vapour phase, are:
(1) Chain and dimer, respectively
(2) Linear in both
(3) Dimer and Linear, respectively
(4) Chain in both

NEET(UG) 2022

13. Identify the incorrect statement from the following
(1) The oxidation number of K in KO_2 is + 4.
(2) Ionisation enthalpy of alkali metals decreases from top to bottom in the group.
(3) Lithium is the strongest reducing agent among the alkali metals.
(4) Alkali metals react with water to form their hydroxides.

14. Match List-I with List-II.

List-I		List-II	
(a)	Li	(i)	absorbent for carbon dioxide
(b)	Na	(ii)	electrochemical cells
(c)	KOH	(iii)	coolant in fast breeder reactors
(d)	Cs	(iv)	photoelectric cell

Choose the correct answer from the options given below :
(1) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
(2) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)
(3) (a)-(ii), (b)-(iii), (c)-(i), (d)-(iv)
(4) (a)-(iv), (b)-(i), (c)-(iii), (d)-(ii)

15. $CaCl_2$ and $Ca(OCl)_2$ are components of :
(1) gypsum
(2) Portland cement
(3) bleaching powder
(4) lime water

EXERCISE-II (Previous Year Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	**4**	**4**	**1**	**1**	**1**	**1**	**3**	**1**	**2**	**4**	**4**	**1**	**1**	**3**	**3**

1. Given below are two statements :

Statement-I : Except beryllium fluoride all the other fluoride of alkaline earth metals are ionic in nature.

Statement-II : Beryllium halides are essentially covalent and soluble in organic solvent.

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

(1) Statement I & II both are correct.
(2) Statement I is correct but II is incorrect.
(3) Statement I is incorrect but II is correct
(4) Both statement I & II are incorrect.

2. Given below are two statements :

Statement-I : Solubility of carbonates of alkali metals increases on moving down the group. While decrease of alkaline earth metals carbonates and sulphates.

Statement-II : The ionic radius of $K^{\oplus}$ is greater than all the alkaline earth metal ions.

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

(1) Statement I & II both are correct.
(2) Statement I is correct but II is incorrect.
(3) Statement I is incorrect but II is correct
(4) Both statement I & II are incorrect.

3. Given below are two statements :

Statement-I : the dilute solution of alkalimetals in liquid ammonia is paramagnetic and dark blue in colour.

Statement-II : On increasing the concentration of alkalimetal in liquid ammonia, blue colour is finally converted into bronze and solution becomes paramagnetic in nature.

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

(1) Statement I & II both are correct.
(2) Statement I is correct but II is incorrect.
(3) Statement I is incorrect but II is correct
(4) Both statement I & II are incorrect.

4. Given below are two statements :

Statement-I : KO_2 is coloured and paramagnetic compound.

Statement-II : O_2^- has one unpaired electron in KO_2.

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

(1) Statement I & II both are correct.
(2) Statement I is correct but II is incorrect.
(3) Statement I is incorrect but II is correct
(4) Both statement I & II are incorrect.

5. Given below are two statements :

Statement-I : LiCl is deliquescent and crystallises as a hydrate $LiCl.6H_2O$.

Statement-II : The ionic potential of Li^+ ion is highest among all the alkali metal ions.

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

(1) Statement I & II both are correct.
(2) Statement I is correct but II is incorrect.
(3) Statement I is incorrect but II is correct
(4) Both statement I & II are incorrect.

6. Given below are two statements :

Statement-I : LiF is much more soluble in water with in their group fluoride.

Statement-II : Li_2CO_3 does not decompose easily on heating.

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

(1) Statement I & II both are correct.
(2) Statement I is correct but II is incorrect.
(3) Statement I is incorrect but II is correct
(4) Both statement I & II are incorrect.

7. Given below are two statements; one is labelled as **Assertion (A)** and the other is labelled as **Reason(R)** .

Assertion : The carbonate of lithium decomposes easily on heating to form lithium oxide and CO_2.

Reason : Lithium being very small in size polarises large carbonate ion leading the formation of more stable Li_2O and CO_2.

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

(1) If (A) & (R) both are correct and (R) is the correct explanation of (A).

(2) If (A) & (R) both are correct but (R) is not correct explanation of (A).

(3) If (A) is correct but (R) is incorrect.

(4) (A) & (R) both are incorrect.

8. Given below are two statements; one is labelled as **Assertion (A)** and the other is labelled as **Reason(R)** .

Assertion : $BeSO_4$ & $MgSO_4$ are readily soluble in water.

Reason : Greater values of hydration enthalpies of Be^{+2} and Mg^{+2} ions overcome the lattice enthalpy factor.

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

(1) If (A) & (R) both are correct and (R) is the correct explanation of (A).

(2) If (A) & (R) both are correct but (R) is not correct explanation of (A).

(3) If (A) is correct but (R) is incorrect.

(4) (A) & (R) both are incorrect.

9. Given below are two statements; one is labelled as **Assertion (A)** and the other is labelled as **Reason(R)**.

Assertion : The enthalpy of formation (ΔH_f) of fluoride of alkali metals become more negative as we go down the group.

Reason : The lattice energy of M^+F^- increases on moveing down the group.

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

(1) If (A) & (R) both are correct and (R) is the correct explanation of (A).

(2) If (A) & (R) both are correct but (R) is not correct explanation of (A).

(3) If (A) is correct but (R) is incorrect.

(4) (A) & (R) both are incorrect.

10. Given below are two statements; one is labelled as **Assertion (A)** and the other is labelled as **Reason(R)** .

Assertion : The ammonia soda process is used to produced Na_2CO_3 synthetically but K_2CO_3 can not be produced.

Reason : $KHCO_3$ is highly soluble in water than $NaHCO_3$.

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

(1) If (A) & (R) both are correct and (R) is the correct explanation of (A).

(2) If (A) & (R) both are correct but (R) is not correct explanation of (A).

(3) If (A) is correct but (R) is incorrect.

(4) (A) & (R) both are incorrect.

11. Match the column :-

Column-I		**Column-II**	
(a)	$Na_2CO_3.10H_2O$	(p)	Used in space & submarine
(b)	CaO	(q)	Used in fire extinguishers
(c)	$NaHCO_3$	(r)	Used in petroleum refining
(d)	Na_2O_2 or KO_2	(s)	used in water softening

(1) a – r, b – s, c –p, d – q

(2) a – q, b – s, c – p, d – r

(3) a – s, b – r, c – q, d – p

(4) a – s, b – r, c – p, d – q

12. Match the column :-

Column-I (Element)		Column-II (Flame colour)	
(a)	Li	(p)	Golden yellow
(b)	Na	(q)	Crimson red
(c)	K	(r)	Violet
(d)	Rb	(s)	Red violet

(1) a – p, b – q, c – s, d – r
(2) a – q, b – p, c – r, d – s
(3) a – s, b – r, c – s, d – p
(4) a – q, b – p, c – s, d – r

13. Match the column :-

Column-I (Compound)		Column-II (Process of formation)	
(a)	$Na_2CO_3.10H_2O$	(p)	Castner-Kellner process
(b)	NaOH	(q)	Solvey process
(c)	$CaSO_4.\frac{1}{2}H_2O$ (Properlike)	(r)	Formed by heating of zypsum
(d)	$CaOCl_2$	(s)	Formed by the reaction of $Ca(OH)_2$ withCl_2

(1) a – q, b – p, c – s, d – r
(2) a – p, b – q, c – s, d – r
(3) a – q, b – p, c – r, d – s
(4) a – p, b – q, c – r, d – s

14. Match the column :-

Column-I (Alloy)		Column-II (Uses)	
(a)	Li – Pb	(p)	as a coolant in fast breeder nuclear reactor.
(b)	Li – Al	(q)	bearing for motor engines
(c)	Li – Mg	(r)	Aircraft parts
(d)	Liquid Na	(s)	Armor part

(1) a – q, b – p, c – r, d – s
(2) a – p, b – q, c – s, d – r
(3) a – q, b – r, c – s, d – p
(4) a – p, b – q, c – r, d – s

15. Match the column :-

Column-I (Element)		Column-II (Propertics)	
(a)	Li	(p)	Most negative E° value
(b)	Na	(q)	Soluble sulphate
(c)	Be	(r)	Least negative E° value among all alkalimetals
(d)	Ba	(s)	$6s^2$ outer electronic configuration

(1) a – q, b – p, c – r, d – s
(2) a – p, b – q, c – s, d – r
(3) a – s, b – p, c – q, d – r
(4) a – p, b – r, c – q, d – s

16. NaCl imparts of golden yellow colour to the Barnes flame. this is due to:-
(A) Photosensitivity of sodium
(B) Low l.p. of sodium
(C) Sublimation of metallic sodium to give yellow vapour.
(D) Emission of excess energy absorbed as a radiation in the visible region.
(1) If (A), (B) and (C) options are correct.
(2) If (A) and (B) both options are correct.
(3) If (B) and (D) both options are correct.
(4) If (A) and (C) both options are correct.

17. The pair of compound that cannot exist together in aqueous solution:-
(A) $NaHCO_3$ + NaOH
(B) NaH_2PO_4 + NaOH
(C) Na_2CO_3 + NaOH
(D) NaH_2PO_2 + Na_2HPO_4
(1) If (A), (B) and (C) options are correct.
(2) If (A) and (B) both options are correct.
(3) If (B) and (D) both options are correct.
(4) If (A) and (C) both options are correct.

18. Which of the following compound does not conduct electricity in molten state :-
(A) $BeCl_2$ (B) BeF_2 (C) $BaCl_2$ (D) CaF_2
(1) If (A), (B) and (C) options are correct.
(2) If (A) and (B) both options are correct.
(3) If (B) and (D) both options are correct.
(4) If (A) and (C) both options are correct.

19. The metal which from nitride on reaction with N_2 :-
(A) Li (B) Al (C) Mg (D) Na
(1) If (A), (B) and (C) options are correct.
(2) If (A) and (B) both options are correct.
(3) If (B) and (D) both options are correct.
(4) If (A) and (C) both options are correct.

20. Alkali metals are characterised by :-
(A) Good conductor of heat & electricity
(B) High oxidation potential
(C) Solubility in liquid NH_3
(D) High melting point.
(1) If (A), (B) and (C) options are correct.
(2) If (A) and (B) both options are correct.
(3) If (B) and (D) both options are correct.
(4) If (A) and (C) both options are correct.

EXERCISE-III (Analytical Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	**1**	**1**	**2**	**1**	**3**	**4**	**1**	**1**	**4**	**1**	**3**	**2**	**3**	**3**	**4**
Question	16	17	18	19	20										
Answer	**3**	**2**	**2**	**1**	**1**										