

Exercise # 1

- Q.1** Correct order of density is -
[1] Li > Na [2] K > Na [3] Mg > Ca [4] Cs < Rb
- Q.2** Which is having highest m. p. -
[1] Be [2] Mg [3] Ca [4] Sr
- Q.3** Weak reductant in alkali metal is -
[1] Li [2] Na [3] K [4] Cs
- Q.4** The metal used in photoelectric cell is -
[1] Na [2] K [3] Mg [4] Ca
- Q.5** Lithium chloride is highly soluble in -
[1] C_6H_6 [2] H_2O [3] D_2O [4] All
- Q.6** Which metal will not form superoxide -
[1] Li [2] Be [3] Na [4] All
- Q.7** More stable hydride is -
[1] Cs – H [2] Rb – H [3] K – H [4] Li – H
- Q.8** In which compound hydrogen is electronegative -
[1] CaH_2 [2] CH_4 [3] HCl [4] All
- Q.9** Alkali metal do not form dipositive ions because they have high -
[1] Nuclear charge [2] Electron affinity [3] Second I.P. [4] Third I.P.
- Q.10** Be shows diagonal relationship with -
[1] Li [2] Mg [3] Al [4] Ba
- Q.11** Which of the following metal will give apple green colour on Bunsen flame -
[1] Ba [2] Sr [3] Ca [4] K
- Q.12** The density of -
[1] Na > K [2] Na = K [3] K > Na [4] Li > K
- Q.13** Alkali metals salts are -
[1] Diamagnetic and coloured [2] Diamagnetic and colourless
[3] Paramagnetic and coloured [4] Paramagnetic and colourless
- Q.14** Alkali metals show -
[1] Only + 1 oxidation state [2] Only – 1 oxidation state
[3] +1 and +2 oxidation state [4] –1 and –2 oxidation state
- Q.15** Ionic conductances of hydrated M^+ ions are in the order -
[1] $Li^+(aq) > Na^+(aq) > K^+(aq) > Rb^+(aq) > Cs^+(aq)$ [2] $Li^+(aq) > Na^+(aq) < K^+(aq) < Rb^+(aq) < Cs^+(aq)$
[3] $Li^+(aq) > Na^+(aq) > K^+(aq) > Rb^+(aq) < Cs^+(aq)$ [4] $Li^+(aq) < Na^+(aq) < K^+(aq) < Rb^+(aq) < Cs^+(aq)$

Q.16 The ionic radii of alkali metal ions in water (hydrated radii) are in the order -

- [1] $\text{Li}^+ > \text{Na}^+ > \text{K}^+ > \text{Rb}^+ > \text{Cs}^+$ [2] $\text{Li}^+(\text{aq}) > \text{Na}^+(\text{aq}) > \text{K}^+(\text{aq}) > \text{Rb}^+(\text{aq}) > \text{Cs}^+(\text{aq})$
 [3] $\text{Li}^+ < \text{Na}^+ > \text{K}^+ > \text{Rb}^+ > \text{Cs}^+$ [4] $\text{Li}^+(\text{aq}) > \text{Na}^+(\text{aq}) < \text{K}^+(\text{aq}) < \text{Rb}^+(\text{aq}) < \text{Cs}^+(\text{aq})$

Q.17 Which of the following halides has the highest melting point -

- [1] NaCl [2] KCl [3] NaBr [4] NaF

Q.18 Which of the following does not give an oxide on heating -

- [1] MgCO_3 [2] Li_2CO_3 [3] ZnCO_3 [4] K_2CO_3

Q.19 When heated in steam, Mg burns brilliantly producing -

- [1] $\text{Mg}(\text{OH})_2$ [2] MgO and H_2 [3] MgO and O_2 [4] MgO and O_3

Q.20 A blue coloured solution of sodium in liquid NH_3 acts as strong reducing agent, because -

- [1] Of ammoniated sodium [2] Ammonia dissociates [3] Sodium nitride is formed [4] Of ammoniated electron

Q.21 When magnesium ribbon is heated to redness in an atmosphere of nitrogen and subsequently cooled with water, the gas evolved is -

- [1] N_2 [2] NH_3 [3] O_2 [4] CO_2

Q.22 The hydration energy of Mg^{+2} is greater than that of -

- [1] Na^+ [2] Be^{+2} [3] Al^{+3} [4] All

Q.23 Alkali metal-liquid ammonia solution are blue due to the -

- [1] Solvated electron [2] Solvated proton [3] Solvated NH_2^- ion [4] Solvated Na^+ ion

Q.24 Molten potassium chloride conduct electricity due to the presence of -

- [1] Free electron [2] Free ions
 [3] Free molecules [4] Atom of potassium & chloride

Q.25 Which of the following element have tendency to form complex compound -

- [1] Be [2] Ba [3] Ca [4] None of these

Q.26 On heating sodium metal in the current of dry ammonia leads to the formation of which gas -

- [1] NaNH_2 [2] NaN_3 [3] NH_3 [4] H_2

Q.27 The degree of hydration down the group from Li^+ to Cs^+ -

- [1] Decrease [2] Increase [3] Remain same [4] None of these

Q.28 The reactivity of IA elements is due to -

- [1] Low I.P. [2] Low electronegativity [3] Low heat of atomization [4] All the above

Q.29 The metal not found in the native state is -

- [1] K [2] Cu [3] Ag [4] Au

Q.30 Which compound having low lattice energy -

- [1] Cs - F [2] Cs - Cl [3] Cs - Br [4] Cs - I

Q.31 The property of Be resembles with -

- [1] Mg, Al [2] Li, Al [3] Na, Mg [4] K, Ca

- Q.32** The hydration energy of Be^{+2} is greater than that of -
 [1] Li^+ [2] Mg^{+2} [3] Ba^{+2} [4] All of the above
- Q.33** Which is more soluble in pyridine -
 [1] NaCl [2] MgCl_2 [3] AlCl_3 [4] All of the above
- Q.34** In barium hydride, hydrogen is -
 [1] Electro positive [2] Electro negative [3] Neutral [4] None of these
- Q.35** Which of the following having high polarization power -
 [1] Na^+ [2] K^+ [3] Mg^{+2} [4] Ca^{+2}
- Q.36** Sodium form Na^+ and not Na^{2+} because -
 [1] Sodium contains only one electron in outer most shell
 [2] First ionisation potential is small and the difference in first and second ionization potentials is very large
 [3] Radius of Na^{2+} is much smaller than of Na^+
 [4] None of these
- Q.37** Sodium reacts with water more vigorously than lithium because it -
 [1] Has higher atomic weight [2] Is more electronegative [3] Is more electropositive [4] Is a metal
- Q.38** Which of the following alkali metals has the biggest tendency of the half reaction -

$$\text{M}_{(g)} \longrightarrow \text{M}_{(aq)}^+ + e$$
 [1] Sodium [2] Lithium [3] Potassium [4] Cesium
- Q.39** Which of the following forms the most basic hydroxide -
 [1] Cu [2] Al [3] Na [4] Zn
- Q.40** Complex forming tendency is more for -
 [1] Na^+ [2] K^+ [3] Rb^+ [4] Li^+
- Q.41** The strongest reducing agent is -
 [1] Be [2] Mg [3] Sr [4] Ba
- Q.42** Both Be and Al become passive on reaction with conc. nitric acid due to -
 [1] The non reactive nature of the metal
 [2] The non reactive nature of the acid
 [3] The formation of an inert oxide layer on the surface of the metals
 [4] None of these
- Q.43** Which of the following is an amphoteric oxide -
 [1] CaO [2] SrO [3] BeO [4] MgO
- Q.44** Which one of the following is most soluble in ether -
 [1] BeCl_2 [2] CaCl_2 [3] SrCl_2 [4] None of these
- Q.45** Li has the maximum value of ionisation potential among alkali metals i.e. lithium has the minimum tendency to ionise to give Li^+ ion. thus, in aq. solution lithium is -
 [1] Strongest reducing agent [2] Poorest reducing agent [3] Strongest oxidising agent [4] All

- Q.46** $\text{Be}(\text{OH})_2$ is -
 [1] Acidic [2] Basic [3] Amphoteric [4] Neutral
- Q.47** MgBr_2 and MgI_2 are soluble in acetone because of -
 [1] Their ionic nature [2] Their covalent nature [3] Their co-ordinatenature [4] None is correct
- Q.48** Sodium metal cannot be stored under -
 [1] Benzene [2] Kerosene [3] Alcohol [4] Toluene
- Q.49** Sodium loses its lustre on exposare to air due to the formation of -
 [1] Na_2O , NaOH and Na_2CO_3 [2] Na_2O and NaOH [3] Na_2O and Na_2CO_3 [4] NaOH and Na_2CO_3
- Q.50** Sodium exhibits metallic lustre which is due to -
 [1] Excitation of free electron [2] Oscillation of free electrons
 [3] Diffusion of Na^+ ion [4] All
- Q.51** Which gives green colour in fire works -
 [1] Be [2] K [3] Ca [4] Ba
- Q.52** The alkali metals are soft due to -
 [1] B.C.C. structure [2] 68% packing efficiency [3] Weak metallic bond [4] All the above
- Q.53** Potassium carbonate when heated to high temperature -
 [1] Gives CO_2 [2] Gives O_2 [3] Gives CO [4] Gives no gas at all
- Q.54** On Flame test K give ----- colour -
 [1] Golden yellow [2] Crimson red [3] Violet [4] Apple green
- Q.55** The most soluble compound in water is -
 [1] CuS [2] MnS [3] K_2S [4] ZnS
- Q.56** Which is more basic in character -
 [1] RbOH [2] KOH [3] LiOH [4] NaOH
- Q.57** Sodium has ----- as compared to potassium -
 [1] Less electronegativity [2] More ionization potential [3] Large atomic radius [4] Lower melting point
- Q.58** Which of the following compounds on reaction with NaOH and H_2O_2 gives yellow colour -
 [1] $\text{Zn}(\text{OH})_2$ [2] $\text{Cr}(\text{OH})_3$ [3] $\text{Al}(\text{OH})_3$ [4] None of these
- Q.59** Dissolving metallic zinc in excess of NaOH produces -
 [1] $\text{Zn}(\text{OH})_2$ [2] Na_2ZnO_2 [3] ZnO [4] $\text{Zn}(\text{OH})_2 + \text{Na}_2\text{ZnO}_2$
- Q.60** In the case of the alkali metals -
 [1] The cation is less stable that the atom [2] The cation is smaller than the atom
 [3] The cation and the atom have about the same size [4] The cation is larger than the atom
- Q.61** An element having electronic configuration $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$ will form -
 [1] Acidic oxide [2] Basic oxide [3] Amphoteric oxide [4] Neutral oxide

- Q.78** A solution of KOH in water is called -
 [1] Potashlye [2] Sodalye [3] Salt cake [4] None of these
- Q.79** Which metal does not form ionic hydride -
 [1] Na [2] Rb [3] Ca [4] Be
- Q.80** Which of the following alkali metal ion in aqueous solution is the best conductor of electricity -
 [1] Li^+ [2] Na^+ [3] Cs^+ [4] K^+
- Q.81** Which one is not known to form compounds in more than one oxidation state -
 [1] Noble gas [2] Halogens [3] Alkali metals [4] Transition metal
- Q.82** The element of IA group which combine directly with nitrogen is -
 [1] Li [2] Na [3] K [4] Cs
- Q.83** Which of the following forms metal oxide on heating -
 [1] Na_2CO_3 [2] Li_2CO_3 [3] K_2SO_4 [4] NaHCO_3
- Q.84** Which of the following releases 0.2 moles of hydrogen on hydrolysis -
 [1] 0.1 mole of LiH [2] 0.2 mole of LiH [3] 0.3 mole of LiH [4] 0.4 mole of LiH
- Q.85** Highest melting point metal is -
 [1] Li [2] Na [3] K [4] Rb
- Q.86** On electrolysis of fused NaCl the final product is -
 [1] Na [2] NaOH [3] NaClO [4] NaClO_3
- Q.87** Increasing order of stability of -
 I. K_2CO_3 II. MgCO_3 III. Na_2CO_3
 [1] I < II < III [2] II < III < I [3] II < I < III [4] I < III < II
- Q.88** Which of the following has an unpaired electron in it -
 [1] K_2O [2] K_2O_2 [3] KO_2 [4] Na_2O
- Q.89** Which of the following oxide is amphoteric in nature -
 [1] Na_2O [2] Li_2O [3] K_2O [4] BeO
- Q.90** A compound which on hydrolysis releases ammonia is -
 [1] Li_3N [2] LiNO_3 [3] NaNO_3 [4] None of these
- Q.91** Which of the following undergoes maximum hydration -
 [1] Li^+ [2] Na^+ [3] K^+ [4] Rb^+
- Q.92** The metal ion which does not give any flame colouration is -
 [1] Li^+ [2] Be^{+2} [3] Na^+ [4] K^+
- Q.93** Which of the following exists as hydrated salt -
 [1] NaCl [2] LiCl [3] RbCl [4] KCl

Q.94 NaHCO_3 can be used to -

- [1] Decrease acidity of stomach [2] Prepare CO_2 used as fire extinguisher
 [3] Prepare bread [4] All of these

Q.95 Which of the following has highest p/e ratio -

- [1] Na^+ [2] Mg^{+2} [3] Al^{+3} [4] O^{-2}

Q.96 The metal showing resemblance with lithium is -

- [1] Be [2] Mg [3] Al [4] Ca

Q.97 Strong reductant in IIA and IA group is -

- [1] Ba, Li [2] Li, Be [3] Cs, Ba [4] Ba, Cs

Q.98 Alkali metals give colour in bunsen flame due to -

- [1] Low electronegativity [2] One e^- in outer most orbit
 [3] Smaller atomic radii [4] Low ionisation energy

Q.99 In the preparation of sodium carbonate which of the following is used -

- [1] Slaked lime [2] Lime stone [3] NaOH [4] quick lime

Q.100 Hardest s-block metal is -

- [1] Li [2] Na [3] Mg [4] Be

Answer Key - 1

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	3	1	2	2	1	4	4	1	3	3	1	1	2	1	4	2	4	4	2	4
Que.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	2	1	1	2	1	4	1	4	1	4	1	4	3	2	3	2	3	2	3	4
Que.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	4	3	3	1	1	3	2	3	1	2	4	4	4	3	3	1	2	2	2	2
Que.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	2	3	2	3	3	1	2	2	1	2	3	4	1	4	2	1	1	1	4	3
Que.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	3	1	2	2	1	1	2	3	4	1	1	2	2	4	3	2	1	4	2	4

Exercise # 2

- Q.1** The elements of 1st group known as alkali metals because -
[1] They have one electron in their outermost orbital [2] They have lower m.p.
[3] The solutions of their all salts are basic [4] The aqueous solution of their hydroxides are much basic
- Q.2** The ionic conductivity of Li⁺ is lower, because -
[1] The ionisation potential value is least for Li⁺ [2] Li⁺ is not a good conductor of electricity
[3] The size of Li⁺ is very small [4] The degree of hydration of Li⁺ is more
- Q.3** Which pair of element have maximum and minimum electro positive elements respectively -
[1] Na, Be [2] Mg, Li [3] Ca, K [4] K, Be
- Q.4** The aqueous solution of which ion is good conductor of electricity -
[1] Li⁺ [2] Mg⁺² [3] Ba⁺² [4] Cs⁺
- Q.5** The sulphate of which metal does not form alum -
[1] Li [2] Na [3] K [4] Cs
- Q.6** The hydrolysis of which metal chloride occurs -
[1] BeCl₂ [2] MgCl₂ [3] SrCl₂ [4] (1) & (2) both
- Q.7** The electrolytic reduction process is used for alkali metals, because -
[1] They are strong reducing agent [2] They are weak reducing agent
[3] They are good oxidising agent [4] They are available in solid form
- Q.8** Which substance is soluble in pyridine -
[1] BaCl₂ [2] KCl [3] LiCl [4] NaCl
- Q.9** Which statement is false for an element, having 2,8,8,2 electronic configuration -
[1] This element is of IInd group [2] This element is of IVth period
[3] It forms MO₂ type oxide [4] It forms M₂O type oxide
- Q.10** Mostly metals are hard, but metals of 1st A group are soft, because -
[1] Their metallic bond is weak [2] They have loose packing
[3] They have face-centred cubic lattice [4] Their b.p. is low
- Q.11** The normal dehydrating agent, which used in a laboratories -
[1] MgCO₃ [2] CaF₂ [3] MgF₂ [4] CaCl₂
- Q.12** What is the decreasing order of standard oxidation potential of K, Ca and Li -
[1] Ca, Li, K [2] Li, Ca, K [3] Li, K, Ca [4] K, Ca, Li
- Q.13** Which statement will be true for solution, when Ba is dissolved in ammonia -
[1] Solution becomes blue [2] Solution becomes good conductor
[3] Solution remains colourless [4] Both (1) and (2) are correct
- Q.14** Alkaline earth metals show -
[1] Divalency [2] Monovalency [3] Variable valency [4] Zero valency

- Q.15** In the periodic table, the element with atomic number 38 belongs to -
 [1] Period IV and group II [2] Period IV and group IV [3] Period III and group IV [4] Period V and group II
- Q.16** Ca^{2+} is isoelectronic with -
 [1] Na [2] Mg^{2+} [3] Sr^{2+} [4] Ar
- Q.17** Alkali metals contains metallic lustre -
 [1] Because of smooth surface of metal [2] Because of oscillation of free electrons
 [3] Because of kernel of metal atom [4] Because of metallic conductivity
- Q.18** In K, Rb and Cs, the decreasing order of reducing power in gaseous state is -
 [1] $\text{K} > \text{Cs} > \text{Rb}$ [2] $\text{Cs} > \text{Rb} > \text{K}$ [3] $\text{K} < \text{Cs} < \text{Rb}$ [4] $\text{Rb} > \text{Cs} > \text{K}$
- Q.19** Prefix 'Alkali' denotes for -
 [1] Silvery lustre of IA group [2] Metallic nature of IIA group
 [3] Active metals of I A group [4] Ashes of plants for IA group
- Q.20** Which of the following is the weakest base -
 [1] NaOH [2] $\text{Zn}(\text{OH})_2$ [3] $\text{Ca}(\text{OH})_2$ [4] KOH
- Q.21** The correct order of density of following elements is -
 [1] $\text{Be} > \text{Mg} > \text{Ca} > \text{Sr}$ [2] $\text{Ca} > \text{Mg} > \text{Be} > \text{Sr}$ [3] $\text{Ca} < \text{Mg} < \text{Be} < \text{Sr}$ [4] $\text{Mg} < \text{Ca} < \text{Sr} < \text{Be}$
- Q.22** Values of standard oxidation potential of elements A, B, C, D are given below -
 (A) -1.50 V [B] $+2.0 \text{ V}$ [C] $+1.10 \text{ V}$ [D] -2.0 V
 The correct order of their oxidising nature is -
 [1] $\text{D} > \text{A} > \text{C} > \text{B}$ [2] $\text{B} > \text{C} > \text{A} > \text{D}$ [3] $\text{C} > \text{A} > \text{B} = \text{D}$ [4] $\text{B} > \text{D} > \text{A} > \text{C}$
- Q.23** Identify the correct statement Elemental sodium -
 [1] Is a strong oxidising agent [2] Can be extracted by electrolysis of aqueous solution
 [3] Its density is lower than K [4] Is easily oxidised
- Q.24** On addition of metal ions, colour of liquid NH_3 solutions converts into bronze, the reason is -
 [1] Ammoniated electrons [2] Metal amide formation
 [3] Liberation of NH_3 gas [4] Cluster formation of metal ions
- Q.25** Correct order of 1st, 2nd and 3rd successive IP of alkaline earth metals is -
 [1] $1^{\text{st}} < 2^{\text{nd}} < 3^{\text{rd}}$ [2] $1^{\text{st}} > 2^{\text{nd}} > 3^{\text{rd}}$ [3] $1^{\text{st}} > 2^{\text{nd}} < 3^{\text{rd}}$ [4] $1^{\text{st}} > 2^{\text{nd}} = 3^{\text{rd}}$
- Q.26** Nitrate of an element of alkali metal group, decomposes on heating, gives brown colour gas, Nitrate and brown colour gas are respectively -
 [1] NaNO_3 and NO [2] LiNO_3 and NO_2 [3] KNO_3 and NH_3 [4] NaNO_3 and NO_2
- Q.27** On allowing ammonia solution of s-block metals to stand for a long time, blue colour becomes fade. The reason is -
 [1] Formation of NH_3 gas [2] Formation of metal amide
 [3] Cluster formation of metal ions [4] formation of metal nitrate
- Q.28** Which of the following s-block element reacts with NaOH to give water soluble complex -
 [1] Al [2] Ca [3] Be [4] Li

- Q.29** Dolomite is -
 [1] $\text{KCl} \cdot \text{MgCl}_2 \cdot 6\text{H}_2\text{O}$ [2] $\text{CaCO}_3 \cdot \text{MgCO}_3$ [3] $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ [4] $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$
- Q.30** The properties of Li are similar to those of Mg. This is because of -
 [1] Similar atomic size [2] Similar ionisation potential
 [3] Both found together in nature [4] Similar ionic potential
- Q.31** Which is having least mpt. -
 [1] Ba [2] Ca [3] Mg [4] Be
- Q.32** Silver bromide when dissolve in Hypo solution gives complex in which oxidation state of silver is
 [1] $\text{Na}_3[\text{Ag}(\text{S}_2\text{O}_3)_2]$, (I) [2] $\text{Na}_3[\text{Ag}(\text{S}_2\text{O}_3)_3]$, (III) [3] $\text{Na}_2[\text{Ag}(\text{S}_2\text{O}_3)_2]$, (II) [4] $\text{Na}_3[\text{Ag}(\text{S}_2\text{O}_3)_4]$, (I)
- Q.33** Gypsum $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ on heating to about 120°C forms plaster of paris, which has chemical composition represented by
 [1] $2\text{CaSO}_4 \cdot 3\text{H}_2\text{O}$ [2] $\text{CaSO}_4 \cdot \text{H}_2\text{O}$ [3] $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$ [4] $\text{CaSO}_4 \cdot 1\frac{1}{2} \text{H}_2\text{O}$
- Q.34** When Na and Li placed in dry air we get -
 [1] NaOH , Na_2O , Li_2O [2] Na_2CO_3 , Na_2O_2 , Li_2O [3] Na_2O , Li_3N , NH_3 [4] Na_2O , Li_2O , Li_3N
- Q.35** As compared to potassium, sodium has -
 [1] Greater ionic radius [2] Lower density [3] Lower electronegativity [4] Higher ionisation potential
- Q.36** Which of the least molar solubility in H_2O
 [1] LiCl [2] NaCl [3] BeCl_2 [4] CsCl
- Q.37** Which of the following oxide having O_2^{2-} (peroxide) anion -
 [1] Na_2O [2] BaO_2 [3] RbO_2 [4] KO_2
- Q.38** Mixture of MgCl_2 and MgO is called -
 [1] Portland cement [2] Sorrel cement [3] Double salt [4] Plaster of paris
- Q.39** Sodium thiosulphate (Hypo) is used in photography because of its -
 [1] Reducing behaviour [2] Complex formation behaviour
 [3] Oxidising behaviour [4] Photosensetivity
- Q.40** Hydration energy of Li^+ is larger than that of -
 [1] Be^{+2} [2] Mg^{+2} [3] Na^+ [4] Al^{+3}
- Q.41** Which of the following properties of IA group metals increases as the atomic number rises :
 [a] Metallic character [b] Ionic radius [c] Melting point [d] Density [e] Ionisation potential
 Correct answer is -
 [1] a, b, c [2] a, b, d [3] c, d, e [4] All of these
- Q.42** The hydride ion H^- is stronger base than its hydroxide ion OH^- . Which of the following reaction will occur if sodium hydride is dissolved in water -
 [1] $\text{H}^-_{(\text{aq})} + \text{H}_2\text{O} \rightarrow \text{H}_3\text{O}^+$ [2] $\text{H}^-_{(\text{aq})} + \text{H}_2\text{O} \rightarrow \text{OH}^- + \text{H}_2$ [3] $\text{H}^- + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{O}_2$ [4] $\text{H}^- + \text{H}_2\text{O} \rightarrow$ No reaction
- Q.43** Which of the following s-block metals do not impart any colour to the flame -
 [1] Li, Be [2] Cs, Fr [3] Be, Mg [4] Ba, Ra
- Q.44** The metal extracted by electrolysis of its fused salt is -
 [1] Fe [2] Pb [3] Cu [4] Na
- Q.45** Lime stone is
 [1] CaO [2] $\text{Ca}(\text{OH})_2$ [3] 1 & 2 both [4] None of these
- Q.46** Be (IIA) shows different behaviour as compared to other elements of the same group the reason is
 [1] Small size and high electronegativity [2] Small size and low electronegativity
 [3] Bigger size and low ionization energy [4] Bigger size and large ionic radius

Q.47 Consider the following statements -

- [a] Cs^+ is more highly hydrated than the other alkali metal ion
 [b] Among the alkali metals Li, Na, K and Rb, Lithium has the highest melting point
 [c] Among the alkali metals Lithium forms a stable nitride by direct combination of these statement
 [1] a, b, c are correct [2] a, b are correct [3] a, c are correct [4] b and c are correct

Q.48 In water -

- [1] Temporary hardness is due to the bicarbonates of Ca^{+2} and Mg^{+2}
 [2] Permanent hardness is due to chloride and sulphates of Ca^{+2} and Mg^{+2}
 [3] Hardness can be removed by adding bores
 [4] All are correct

Q.49 Which can not be used to generate H_2

- [1] $\text{Al} + \text{NaOH}$ [2] $\text{Zn} + \text{NaOH}$ [3] $\text{Mg} + \text{NaOH}$ [4] $\text{LiH} + \text{H}_2\text{O}$

Q.50 Only those elements of s-block can produce superoxides which have -

- [1] High ionisation energy [2] High electronegativity [3] High charge density [4] Low ionisation potential

Q.51 In the Down's method for the extraction of sodium, the melting point of the electrolyte is lowered by adding -

- [1] Potassium chloride [2] Calcium chloride
 [3] Potassium fluoride [4] Both calcium chloride and potassium fluoride

Q.52 Considering greater polarisation in LiCl as compared to that in NaCl , which of the following statement is wrong -

- [1] LiCl has lower M.P. than NaCl [2] LiCl dissolves in CCl_4 while NaCl does not
 [3] LiCl hydrolyses less as compared to NaCl [4] LiCl is less conductive in water than NaCl

Q.53 Which of the following carbonate will not decompose on heating

- [1] BaCO_3 [2] ZnCO_3 [3] Na_2CO_3 [4] Li_2CO_3

Q.54 The decomposition temperature is maximum for -

- [1] BeCO_3 [2] CaCO_3 [3] K_2CO_3 [4] Li_2CO_3

Q.55 Which is mismatched -

- [1] Nitrolim – $\text{CaCN}_2 + \text{C}$ [2] Microcosmic salt – $\text{Na}(\text{NH}_4)\text{HPO}_4 \cdot 4\text{H}_2\text{O}$
 [3] Soda lime – NaHCO_3 [4] Fusion mixture – $\text{K}_2\text{CO}_3 + \text{Na}_2\text{CO}_3$

Q.56 Metallic magnesium is prepared by -

- [1] Reduction of MgO by coke [2] Electolysis of aqueous solution of $\text{Mg}(\text{NO}_3)_2$
 [3] Displacement of Mg by iron from MgSO_4 solution [4] Electrolysis of molten MgCl_2

Q.57 In alkali metal family caesium should be -

- [1] Least conductive in water [2] Having low b.p. and m.p. [3] Least density [4] The most electronegative

Q.58 What is the missing product 'X' in the following reaction - ($\text{Li}_3\text{N} + 3\text{H}_2\text{O} \rightarrow 3\text{LiOH} + \text{x}$)

- [1] LiNO_3 [2] NO_2 [3] NH_3 [4] $\text{N}_2 + \text{H}_2$

Q.59 Electrolytic reduction of alumina to aluminium by Hall-Heroult process is carried out -

- [1] In the presence of NaCl
 [2] In the presence of fluorite
 [3] In the presence of cryolite which forms a melt with lower melting temperature
 [4] In the presence of cryolite which forms a melt with high melting temperature

Q.60 Alum is the name used for all double salts having the composition $\text{M}^1_2\text{SO}_4 \cdot \text{M}^{\text{III}}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$. Where M^{III} stands for Al^{+3} , Cr^{+3} , Fe^{+3} , while M^1 stands for -

- [1] Li^+ , Cu^+ , Ag^+ [2] Li^+ , NH_4^+ , Na^+ [3] Na^+ , K^+ , Rb^+ [4] Ca^{+2} , Mg^{+2} , Sr^{+2}

- Q.61** Which of the following order is not correct -
 [1] LiF > LiCl > LiBr > LiI – stability [2] NaCl > KCl > RbCl > LiCl – Melting point
 [3] LiH > NaH > KH > RbH – Melting point [4] Ca(OH)₂ > Sr(OH)₂ > NaOH > KOH – Basic character
- Q.62** Which valuable byproduct is obtained in the Down's process for extraction of sodium -
 [1] Oxygen [2] Hydrogen [3] Chlorine [4] 1 and 2 both
- Q.63** Which does not exist in solid state -
 [1] LiHCO₃ [2] CaCO₃ [3] NaHCO₃ [4] Na₂CO₃
- Q.64** Alkali metals dissolve in liquid NH₃ then which of the following observation is not true -
 [1] It becomes paramagnetic [2] Solution turns into blue due to solvated electrons
 [3] It becomes diamagnetic [4] Solution becomes conducting
- Q.65** Limestone ore when heated CO₂ is released. In metallurgy this process is called -
 [1] Smelting [2] Ore-dressing [3] Calcination [4] Roasting
- Q.66** Which of the following element on reacting with cold water liberates H₂
 [1] Be [2] Mg [3] Ca [4] Fe
- Q.67** Alkali metals does not form M⁺² ions. The most probable reason is -
 [1] They have only one electron [2] II and III IP difference is greater than 16 eV
 [3] II and I IP difference is less than 11 eV [4] II and I IP difference is greater than 16 eV
- Q.68** Which of the following oxide is most thermally stable -
 [1] BaO [2] MgO [3] BeO [4] CaO
- Q.69** On passing excess of CO₂ in lime water, its milky appearance disappears because -
 [1] Soluble Ca(OH) is formed [2] Soluble Ca(HCO₃)₂ is formed
 [3] Reaction becomes reversible [4] Calcium compound evaporated
- Q.70** Which of the carbide will give methane when reacts with water -
 [1] BeC₂ [2] CaC₂ [3] Be₂C [4] Mg₂C₃

Answer Key - 2

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	4	4	4	4	1	4	1	3	4	1	4	3	4	1	4	4	2	2	4	2
Que.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	3	1	4	4	1	2	2	3	2	4	3	1	3	4	4	3	2	2	2	3
Que.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	2	2	3	4	4	1	4	4	3	4	4	3	3	3	3	4	2	3	3	3
Que.	61	62	63	64	65	66	67	68	69	70										
Ans.	4	3	1	3	3	3	4	2	2	3										

Exercise # 3

- Q.1** Which of the following alkaline-earth metal hydroxides is the strongest base (CPMT 1996)
 [1] $\text{Be}(\text{OH})_2$ [2] $\text{Mg}(\text{OH})_2$ [3] $\text{Ca}(\text{OH})_2$ [4] $\text{Ba}(\text{OH})_2$
- Q.2** The compounds of alkaline earth metals have the following magnetic nature : (MP PMET/PMT 1998; RPMT 2000; JIPMER 2002)
 [1] Diamagnetic [2] Paramagnetic [3] Ferromagnetic [4] Diferromagnetic
- Q.3** Among KO_2 , NO_2^- , BaO_2 and NO_2^+ unpaired electron is present in : (IIT 1997)
 [1] NO_2^+ and BaO_2 [2] KO_2 and BaO_2 [3] KO_2 only [4] BaO_2 only
- Q.4** Property of the alkaline earth metals that increases with their atomic number is : (IIT 1997)
 [1] Ionisation energy [2] Solubility of their hydroxides
 [3] Solubility of their sulphates [4] Electronegativity
- Q.5** Lime stone is : (RPMT 1997)
 [1] CaO [2] $\text{Ca}(\text{OH})_2$ [3] Both (1) and (2) [4] None of these
- Q.6** Sodium nitrate (NaNO_3) decomposes above $\sim 800^\circ\text{C}$ to give (IIT 1998)
 [1] O_2 [2] NaO_2 [3] NO_2 [4] Na_2O
- Q.7** The lattice energy of the lithium halides is in the following order : (Roorkee Qualifying 1998)
 [1] $\text{LiF} > \text{LiCl} > \text{LiBr} > \text{LiI}$ [2] $\text{LiCl} > \text{LiF} > \text{LiBr} > \text{LiI}$ [3] $\text{LiBr} > \text{LiCl} > \text{LiF} > \text{LiI}$ [4] $\text{LiI} > \text{LiBr} > \text{LiCl} > \text{LiF}$
- Q.8** $\text{KO}_2 + \text{CO}_2 \rightarrow ?$ (Gas) (CPMT 1997)
 [1] H_2 [2] N_2 [3] O_2 [4] CO
- Q.9** Philosopher's wool when heated with BaO at 1100°C gives a compound. Identify the compound : (CPMT 1997)
 [1] BaZnO_2 [2] $\text{Ba} + \text{ZnO}_2$ [3] BaCdO_2 [4] $\text{BaO}_2 + \text{Zn}$
- Q.10** Which of the following substances is used in the laboratory or fast drying of neutral gases : (AIIMS 1998, AFMC 1999)
 [1] Sodium phosphate [2] Phosphorus pentoxide
 [3] Sodium sulphate [4] Anhydrous calcium chloride
- Q.11** Amongst LiCl , RbCl , BeCl_2 and MgCl_2 . Maximum and minimum ionic character will be shown by the compounds. (RPMT 1999)
 [1] LiCl , MgCl_2 [2] RbCl , BeCl_2 [3] RbCl , MgCl_2 [4] MgCl_2 , BeCl_2
- Q.12** The word 'alkali' is used for alkali metals indicates : (RPMT 1999)
 [1] Ash of the plant [2] Metallic nature [3] Silvery luster [4] Active metal
- Q.13** Potassium nitrate is called : (RPMT 1999)
 [1] Mohr's salt [2] Gypsum [3] Indian salt petre [4] Chile salt petre

- Q.14** Sparingly soluble salt is : **(RPMT 1999)**
 [1] KCl [2] NaCl [3] NH_4Cl [4] BaSO_4
- Q.15** The strongest reducing agent of the alkali metal is : **(CPMT 1999)**
 [1] Li [2] Na [3] K [4] Cs
- Q.16** Magnesium does not decompose the : **(AFMC 1999)**
 [1] Steam [2] Hot water [3] Cold water [4] Semi hot water
- Q.17** Alkaline earth metals are denser than alkali metals because metallic bonding is : **(AIIMS 1999)**
 [1] Stronger [2] Weaker [3] Not present [4] Volatile
- Q.18** When sodium is heated with moist air, then the product obtained is : **(AIIMS 1999)**
 [1] Na_2O [2] NaOH [3] Na_2CO_3 [4] Na_2O_2
- Q.19** When sodium bicarbonate is heated strongly or calcined in a kiln, it forms : **(CMPT 2000; Karnataka CET (Met.) 2000)**
 [1] Na [2] Na_2CO_3 [3] NaCO_3 [4] NaHCO_3
- Q.20** Which of the following has the lowest solubility : **(Roorkee 2000)**
 [1] CaF_2 [2] CaCl_2 [3] CaBr_2 [4] CaI_2
- Q.21** Which one of the following on heating will not give CO_2 **(BHU 2000)**
 [1] CaCO_3 [2] Na_2CO_3 [3] PbCO_3 [4] Li_2CO_3
- Q.22** Which one of the following on heating with nitrogen gives a nitride : **(BHU 2000)**
 [1] Na [2] K [3] Li [4] Rb
- Q.23** Which of the following compounds transform baking soda into baking powder : **(AIIMS 2001)**
 [1] KCl [2] KHCO_3 [3] NaHCO_3 [4] $\text{KHC}_4\text{H}_4\text{O}_6$
- Q.24** Which of the following hydroxide is insoluble in water : **(AIIMS 2001)**
 [1] Be(OH)_2 [2] Mg(OH)_2 [3] Ca(OH)_2 [4] Ba(OH)_2
- Q.25** Which of the following gives a green colour to flame: **(AFMC 2001)**
 [1] Barium [2] Calcium [3] Strontium [4] None of these
- Q.26** Sodium gives blue colour with NH_3 solution, this blue colour is due to : **(UPSEAT 2000,02; AMU 2002; RPMT 2002)**
 [1] Ammoniated Na^+ [2] Ammoniated Na^- [3] Ammoniated e^- [4] $\text{Na}^+ / \text{Na}^-$ pair
- Q.27** Fusion mixture is : **(CPMT 2002)**
 [1] $\text{Na}_2\text{CO}_3 + \text{K}_2\text{CO}_3$ [2] $\text{Na}_2\text{CO}_3 + \text{NaHCO}_3$ [3] $\text{Na}_2\text{CO}_3 + \text{NaOH}$ [4] $\text{Na}_2\text{CO}_3 + \text{K}_2\text{SO}_4$
- Q.28** KO_2 (Potassium superoxide) is used in oxygen cylinders in space and submarines because it : **(AIEEE 2002)**
 [1] Absorbs CO_2 and increases O_2 content [2] Eliminates moisture
 [3] Absorbs CO_2 [4] Produces ozone
- Q.29** A metal M readily forms its sulphate MSO_4 which is water-soluble, it forms its oxide MO which becomes inert on heating. It forms an insoluble hydroxide M(OH)_2 which is soluble in NaOH solution. Then M is : **(AIEEE 2002)**
 [1] Mg [2] Ba [3] Ca [4] Be
- Q.30** Which of the following reaction produces hydrogen : **(AIIMS 2002)**
 [1] $\text{Mg} + \text{H}_2\text{O}$ [2] $\text{BaO}_2 + \text{HCl}$ [3] $\text{H}_2\text{S}_4\text{O}_8 + \text{H}_2\text{O}$ [4] $\text{Na}_2\text{O}_2 + 2\text{HCl}$

- Q.31** Assertion (A) : Potassium and caesium are used in photoelectric cells **(AIIMS 2002)**
Reason (R) : Potassium and caesium emit electrons on exposure to light
- [1] Both A and R are true and R is a correct explanation of A
[2] Both A and R are true but R is not a correct explanation of A
[3] A is true but R is false
[4] Both A and R is false
- Q.32** On dissolving moderate amount of sodium metal in liquid NH_3 at low temperature, which one of the following does not occur : **(AIIMS 2003)**
- [1] Blue coloured solution is obtained [2] Na^+ ions are formed in the solution
[3] Liquid NH_3 becomes good conductor of electricity [4] Liquid ammonia remains diamagnetic
- Q.33** Peroxide bond is present in : **(RPET 2003)**
- [1] MgO [2] CaO [3] Li_2O [4] BaO_2
- Q.34** Beryllium and aluminium exhibit many properties which are similar. But, the two elements differ in : **(AIEEE 2004)**
- [1] Exhibiting amphoteric nature in their oxides [2] Forming polymeric hydrides
[3] Forming covalent halides [4] Exhibiting maximum covalency in compounds
- Q.35** The product obtained on fusion of BaSO_4 and Na_2CO_3 is **(AFMC 2005)**
- [1] BaCO_3 [2] BaO [3] Ba(OH)_2 [4] BaHSO_4
- Q.36** Based on lattice energy and other considerations which one of the following alkali metal chlorides is expected to have the highest melting point **(AIEEE 2005)**
- [1] LiCl [2] NaCl [3] KCl [4] RbCl
- Q.37** When washing soda is heated **(AFMC 2005)**
- [1] CO is released [2] $\text{CO} + \text{CO}_2$ is released [3] CO_2 is released [4] Water vapour is released
- Q.38** NaOH is prepared by the method **(AFMC 2005)**
- [1] Down's cell [2] Castner cell [3] Solvay process [4] Castner Kellner cell
- Q.39** Which of the following statements is false **(BHU 2005)**
- [1] CaOCl_2 gives OH^- , Cl^- and OCl^- in aqueous solution [2] Diamond and graphite are allotrops of carbon
[3] Bleaching action of Cl_2 in moist condition is not permanent [4] Calomel is Hg_2Cl_2
- Q.40** The ionic mobility of alkali metal ions in aqueous solution is maximum for - **(AIEEE 2006)**
- [1] Rb^+ [2] Li^+ [3] Na^+ [4] K^+
- Q.41** The charge/size ratio of a cation determines its polarizing power. Which one of the following sequences represents the increasing order of the polarizing power of the cationic species, K^+ , Ca^{2+} , Mg^{2+} , Be^{2+} ? **(AIEEE 2007)**
- [1] $\text{K}^+ < \text{Ca}^{2+} < \text{Mg}^{2+} < \text{Be}^{2+}$ [2] $\text{Ca}^{2+} < \text{Mg}^{2+} < \text{Be}^{2+} < \text{K}^+$
[3] $\text{Mg}^{2+} < \text{Be}^{2+} < \text{K}^+ < \text{Ca}^{2+}$ [4] $\text{Be}^{2+} < \text{K}^+ < \text{Ca}^{2+} < \text{Mg}^{2+}$

Answer Key - 3

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	4	1	3	2	4	1	1	3	1	4	2	1	3	4	1	3	1	3	2	1
Que.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	2	3	4	1	1	3	1	1	4	1	1	4	4	2	1	2	4	4	3	1
Que.	41																			
Ans.	1																			

I A
(1)

II A
(2)

s-block
elements



H¹

Li³

Be⁴

Na¹¹

Mg¹²

K¹⁹

Ca²⁰

Rb³⁷

Sr³⁸

Cs⁵⁵

Ba⁵⁶

Fr⁸⁷

Ra⁸⁸