EXERCISE-I (Conceptual Questions) **Build Up Your Understanding**

PROPERTIES AND COMPOUNDS

1. Correct order of density is -
(1) Li > Na (2) K > Na (3) Mg > Ca (4) Cs < Rb

2. Which is having highest m.p.-
(1) Be (2) Mg (3) Ca (4) Sr

3. Weak reductant in alkali metal is -
(1) Li (2) Na (3) K (4) Cs

4. The metal used in photoelectric cell is -
(1) Na (2) Cs (3) Mg (4) Ca

5. Lithium chloride is highly soluble in -
(1) C_6H_6 (2) H_2O (3) D_2O (4) All

6. Which metal will not form superoxide -
(1) Li (2) Be (3) Na (4) All

7. More stable hydride is -
(1) Cs–H (2) Rb–H (3) K–H (4) Li–H

8. In which compound hydrogen is electronegative -
(1) CaH_2 (2) CH_4 (3) HCl (4) All

9. Which of the following metal will give apple green colour on Bunsen flame -
(1) Ba (2) Sr (3) Ca (4) K

10. The density of-
(l) Na > K (2) Na = K (3) K > Na (4) Li> K

11. Alkali metals salts are-
(1) Diamagnetic and coloured (2) Diamagnetic and colourless
(3) Paramagnetic and coloured (4) Paramagnetic and colourless

12. 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) $Li^+(aq) < Na^+(aq) < K^+(aq) < Rb^+(aq) < Cs^+(aq)$

13. Which of the followihg halides has the highest melting point-
(l) NaCl (2) KCl (3) NaBr (4) NaF

14. Which of the following does not give an oxide on heating
(l) $MgCO_3$ (2) Li_2CO_3 (3) $ZnCO_3$ (4) K_2CO_3

15. When heated in steam, Mg burns brilliantly producing-
(1) $Mg(OH)_2$ (2) MgO and H_2 (3) MgO and O_2 (4) MgO and O_3

16. 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

17. Molten potassium chloride conducts electricity due to the presence of -
(1) Free electron (2) Free ions
(3) Free molecules (4) Atom of potassium & chloride

18. Which of the following. element have maximum tendency to form complex compound-
(1) Be (2) Ba (3) Ca (4) Mg

19. 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

20. 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

21. Which of the following alkali metals has the biggest tendency of the half reaction
$M(g) \longrightarrow M^+(aq) + e^-$
(1) Sodium (2) Lithium (3) Potassium (4) Cesium

22. The strongest reducing agent is -
(l) Be (2) Mg (3) Sr (4) Ba

23. 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

24. Sodium loses its lustre on exposure to moist air due to 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

25. Potassium carbonate when heated to high temperature.
(1) Gives CO_2 (2) Gives O_2
(3) Gives CO (4) Gives no gas at all

26. On Flame test K give ------ colour -
(1) Golden yellow (2) Crimson red
(3) Violet (4) Apple green

27. 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

28. Which decomposes on heating -
(1) NaOH (2) KOH (3) LiOH (4) RbOH

29. Which metal does not form ionic hydride -
(1) Na (2) Rb (3) Ca (4) Be

30. The element of IA group which combines directly with nitrogen is -
(1) Li (2) Na (3) K (4) Cs

31. 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

32. Which of the following is paramagnetic
(1) K_2O (2) K_2O_2 (3) KO_2 (4) Na_2O

33. A compound which upon hydrolysis releases ammonia is-
(1) Li_3N (2) $LiNO_3$ (3) $NaNO_3$ (4) None of these

34. The metal ion which does not give any flame colouration is-
(1) Li^+ (2) Be^{+2} (3) Na^+ (4) K^+

35. Which of the following exists as hydrated salt-
(1) NaCl (2) LiCl (3) RbCl (4) KCl

36. Strong reductant in IIA and IA group is -
(1) Ba, Li (2) Li, Be (3) Cs, Ba (4) Ba, Cs

37. Which statement will be true for solution, when is dissolved in ammonia:
(1) Solution becomes blue
(2) Solution becomes good conductor
(3) Solution remains colourless
(4) Both (1) and (2) are correct

38. In K, Rb and Cs, the decreasing order of reducing power in gaseous state is:
(1) K > Cs > Rb (2) Cs > Rb > K
(3) K < Cs < Rb (4) Rb > Cs > K

39. The correct order of density of following elements is:- (Be, Mg, Ca, Sr)
(1) Be > Mg > Ca > Sr (2) Ca > Mg > Be > Sr
(3) Ca < Mg < Be < Sr (4) Mg < Ca < Sr < Be

40. Identify the correct statement elemental sodium:

(1) Is a strong oxidising agent
(2) Can be extracted by electrolysis of aqueous solution
(3) It's density is lower than K
(4) Is easily oxidised

41. On addition of metal, 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

42. 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

43. Which of the followings-block element reacts with NaOH to give water soluble complex:-
(1) Al (2) Ca (3) Be (4) Li

44. Which .is having least mpt. :-
(1) Ba (2) Ca (3) Mg (4) Be

45. When Na and Li placed in dry air we get :
(1) NaOH, Na_2O, Li_2O (2) Na_2CO_3, Na_2O, Li_2O
(3) Na_2O, Li_3N, NH_3 (4) Na_2O, Li_2O, Li_3N

46. Which of the following oxide having O_2^{-2} (peroxide) anion:-
(1) Na_2O (2) BaO_2 (3) RbO_2 (4) KO_2

47. Which of the following properties of IA group metals in 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

48. 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

49. Which cannot be used to generate H_2 :-
(1) AI + NaOH (2) Zn + NaOH (3) Mg + NaOH (4) LiH + H_2O

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

51. Which does not exists in solid state:-
(1) $LiHCO_3$ (2) $CaCO_3$
(3) $NaHCO_3$ (4) Na_2CO_3

52. Alkali metals dissolve in liquid NH_3 then which of the following observations is not true:
(1) It becomes paramagnetic.
(2) Solution turns & into blue due to solvated electrons
(3) It becomes diamagnetic.
(4) Solution becomes conducting

53. 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 iohisation energy

54. Which of the following ions forms a hydroxide that is highly soluble in water ?
(1) K^+ (2) Zn^{2+} (3) Ni^{2+} (4) Al^{3+}

55. The slaked lime is prepared by' adding water to-
(1) Quick lime
(2) Nitrolim
(3) Lime stone
(4) Plaster of paris

56. The plaster of paris is hardened, by
(1) Liberating CO_2
(2) Giving out water
(3) Combining with water
(4) Changing into $CaCO_3$

57. Which of the following alkali metal carbonate is the least stable and decomposes readily
(1) Li_2CO_3 (2) Na_2CO_3 (3) K_2CO_3 (4) Cs_2CO_3

58. In the reaction $M + O_2 \longrightarrow MO_2$ (super oxide) the metal is-
(1) Li (2) Na (3)K (4) Ba

59. Li does not resemble other alkali metals in following properties.
(l) Li_2CO_3 decomposes into oxides while other alkali carbonates are thermally stable
(2) LiCl is predomiantly covalent
(3) Li_3N is stable
(4) All

60. Be and Al resemble in
(1) Both become passive on reaction with HNO_3 due to formation of oxide layer.
(2) Their chlorides are lewis acids
(3) Hydroxides are soluble in alkali as· well as in acid
(4) All

61. Consider the following points
(a) Cs is the strongest reducing agent in IA group element.
(b) BA does not form peroxide in IIA group elements
(c) The density of potassium is less than sodium ·
(d) In alkali metals Li, Na, K and Rb, lithium has the minimum value of M.P.
Point out that the statement -

(1) (a) & (b) are. correct
(2) (a), (b) & (c) are correct
(3) (h) & (c) are correct
(4)(b), (c) & (d) are correct

62. Mg^{+2} does not f6rmeither peroxide or superoxide, because
(1) Mg^{+2} ion relatively bigger
(2) Mg^{+2} ion is relatively smaller
(3) Mg^{+2} ion is stable
(4) Mg^{+2} ion is unstable

63. The stability order of oxide, peroxide and superoxide of alkali metal is
(1) normal oxide > superoxide > peroxide
(2) normal oxide > peroxide > superoxide
(3) superoxide > peroxide > normal oxide
(4) peroxide > normal oxide > superoxide

64. Which of the following is true about Alkali metals
(1) All form solid bicarbonates
(2) All form ionic salt like hydride MH
(3) All form superoxide like KO_2
(4) All form nitrides

65. Which of the following statement is not correct
(1) LiOH is amphoteric in nature
(2) LiCl is soluble in pyridine
(3) Li_3N is stable while Na_3N doesn't exist even at room temperature
(4) BeO is amphoteric in nature

66. In between the metals A and B both form oxide but B also forms nitride, when both burn in air so A and B are
(1) Cs, K (2) Mg, Ca (3) Li, Na (4) K, Mg

67. Which of the following statement is not correct
(1) BeF_2 forms complex ion with NaF in which Be goes with cation
(2) $BeCO_3$ is kept in the atmosphere of CO_2 since it is least thermally stable
(3) Be dissolves in alkali forming $[Be(OH)_4]^{-2}$
(4) BeF_2 forms complex ion with NaF in which Be goes with anion

68. CO_2 gas along with solid (Y) is obtained when sodium salt (X) is heated. (X) is again obtained when CO_2 gas is passed into aqueous solution of (Y). X andy are:
(1) Na_2CO_3, Na_2O
(2) Na_2CO_3, NaOH
(3) $NaHCO_3$, Na_2CO_3
(4) Na_2CO_3, $NaHCO_3$

69. A compound which can be used in space vehicles both to absorb CO_2 and liberate O_2 is :
(1) NaOH (2) Na_2 (3) Na_2O_2 (4) CaO + NaOH

70. There is loss in weight when mixture of Li_2CO_3 and $Na_2CO_3.10H_2O$ is heated strongly. This loss is due to :
(1) Li_2CO_3
(2) $Na_2CO_3.10H_2O$
(3) Both
(4) None

Note : Q. 71 to 7 4 are based on following reaction(s) :

$A \xrightarrow{\Delta} B \text{ (oxide)} + CO_2$
$B + H_2O \longrightarrow C$
$C + CO_2 \longrightarrow A \text{ (milky)}$
$B + NH_4Cl \xrightarrow{\Delta} D \text{ (gas)}$
$D + H_2O + CO_2 \longrightarrow E$
$E + NaCl \longrightarrow F$
$F \xrightarrow{\Delta} Na_2CO_3 + CO_2 + H_2O$

71. Name of the process is :
(1) solvay (2) ammonia-soda (3) both correct (4) none is correct

72. A is:
(1) $Ca(HCO_3)_2$ (2) $CaCO_3$ (3) CaO (4) Na_2CO_3

73. B and Care:
(1) CaO, $Ca(OH)_2$ (2) $Ca(OH)_2$, $CaCO_3$
(3) $CaCO_3$, $Ca(OH)_2$ (4) $Ca(OH)_2$, CaO

74. D, E and F are :
(1) NH_3, NH_4Cl, NH_4HCO_3 (2) NH_3, NH_4HCO_3, $NaHCO_3$
(3) NH_4HCO_3, Na_2CO_3, $NaHCO_3$ (4) None

75. A wire of an alkaline earth metal X, burnt in air and dipped in water, a gas 'Y' is evolved X and. Y are respectively :-
(1) Na, NO_2 (2) Be, NO_2 (3) Mg, CO_2 (4) Mg, NH_3

ANSWER KEY

EXERCISE-I

1.	(3)	**2.**	(1)	**3.**	(2)	**4.**	(2)	**5.**	(1)	**6.**	(4)	**7.**	(4)
8.	(1)	**9.**	(1)	**10.**	(1)	**11.**	(2)	**12.**	(4)	**13.**	(4)	**14.**	(4)
15.	(2)	**16.**	(2)	**17.**	(2)	**18.**	(1)	**19.**	(4)	**20.**	(3)	**21.**	(2)
22.	(4)	**23.**	(3)	**24.**	(1)	**25.**	(4)	**26.**	(3)	**27.**	(2)	**28.**	(3)
29.	(4)	**30.**	(1)	**31.**	(2)	**32.**	(3)	**33.**	(1)	**34.**	(2)	**35.**	(2)
36.	(1)	**37.**	(4)	**38.**	(2)	**39.**	(3)	**40.**	(4)	**41.**	(4)	**42.**	(2)
43.	(3)	**44.**	(3)	**45.**	(4)	**46.**	(2)	**47.**	(2)	**48.**	(3)	**49.**	(3)
50.	(4)	**51.**	(1)	**52.**	(3)	**53.**	(4)	**54.**	(1)	**55.**	(1)	**56.**	(3)
57.	(1)	**58.**	(3)	**59.**	(4)	**60.**	(4)	**61.**	(3)	**62.**	(2)	**63.**	(2)
64.	(2)	**65.**	(1)	**66.**	(4)	**67.**	(1)	**68.**	(3)	**69.**	(3)	**70.**	(3)
71.	(3)	**72.**	(2)	**73.**	(1)	**74.**	(2)	**75.**	(4)				