

Shiksha Classes Bhandara

Subject : Chemistry

Topic : Hydrogen & s-block

M.M. : 100

Marking Scheme:

- (i) Each question is allotted 4 (four) marks for each correct response.
- (ii) $\frac{1}{4}$ (one fourth) marks will be deducted for indicating incorrect response of each question. No deduction from the total score will be made if no response is indicated for an item in the answer sheet.
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- Q.1** Ca on exposure in moist air form a layer on surface as-
- (A) CaCO_3 (B) Ca(OH)_2
(C) $\text{CaCO}_3 \cdot \text{Ca(OH)}_2$ (D) CaO
- Q.2** The following is the correct order of chemical reactivity with water according to electromotive series-
- (A) $\text{K} > \text{Mg} > \text{Cu} > \text{Zn}$ (B) $\text{K} > \text{Mg} > \text{Zn} > \text{Cu}$
(C) $\text{Cu} > \text{Zn} > \text{K} > \text{Mg}$ (D) $\text{Mg} > \text{K} > \text{Cu} > \text{Zn}$
- Q.3** Which of the following statements is correct.
- (A) Alkali metals are less electropositive than alkaline earth metals
(B) The alkaline earth metals are more denser and harder than alkali metals
(C) The alkali metals are denser and harder than alkaline earth metals
(D) The first IP of alkali metals is more than that of alkaline earth metals
- Q.4** The reaction of sodium with water is highly exothermic. The rate of reaction can be lowered by –
- (A) Decreasing the temperature
(B) Mixing with alcohol
(C) Mixing with acetic acid
(D) Making an amalgam
- Q.5** Identify the correct statement –
- (A) Gypsum contains a lower percentage of calcium than plaster of paris
(B) Gypsum is obtained by heating plaster of paris
(C) Plaster of paris can be obtained by hydration of gypsum
(D) None of these
- Q.6** Alkali metals are-
- (A) Diamagnetic and coloured
(B) Diamagnetic and colourless
(C) Paramagnetic and coloured
(D) Paramagnetic and colourless

- Q.7** Magnesium hydride can be prepared by the action of-
- (A) Lithium hydride on magnesium chloride
(B) Aluminium hydride on magnesium chloride
(C) Lithium aluminium hydride on magnesium chloride
(D) Lithium magnesium hydride on lithium chloride
- Q.8** The reason for the lower basicity of alkaline earth metals than alkali metals is.
- (A) Alkali metals form ionic compounds
(B) The bond of oxygen is more for alkali metals
(C) The electropositivity of alkali metals is more than alkaline earth metals
(D) The electropositivity of alkali metals is less than alkaline earth metals
- Q.9** $\text{K}_4[\text{Fe(CN)}_6] + \text{H}_2\text{SO}_4 + \text{H}_2\text{O} \rightarrow \text{K}_2\text{SO}_4 + \text{FeSO}_4 + (\text{NH}_4)_2\text{SO}_4 + \text{CO}$
- Which of the following statement is correct for the above reaction –
- (A) It is a disproportionation reaction
(B) It is acidic hydrolysis
(C) Oxidation number of C changes from +2 to +4
(D) n factor for $\text{K}_4[\text{Fe(CN)}_6]$ is 12
- Q.10** Among the following groups of oxides, the group containing oxides that cannot be reduced by carbon to give the respective metals is –
- (A) PbO , Fe_3O_4 (B) CaO , K_2O
(C) Cu_2O , SnO_2 (D) Fe_2O_3 , ZnO
- Q.11** Number of crystal water in Gypsum, Plaster of Paris and Epsom salt respectively are-
- (A) 2, 0.5, 7 (B) 7, 2, 1
(C) 7, 0.5, 2 (D) 3, 4, 2
- Q.12** The strongest reducing agent is-
- (A) Be (B) Mg
(C) Sr (D) Ba
- Q.13** Thermally the most stable alkaline earth metal carbonate is
- (A) MgCO_3 (B) CaCO_3
(C) SrCO_3 (D) BaCO_3
- Q.14** What are α , β and γ in the following equation
- $$\alpha \text{K}_4[\text{Fe(CN)}_6] + \beta \text{K}_2\text{CO}_3 + \gamma \text{S} \xrightarrow{\text{heat}} \text{Products ?}$$
- the products are Fe, CO_2 , KCNO and KSCN .
- (A) 1, 2, 3 (B) 2, 1, 5
(C) 1, 1, 5 (D) 2, 2, 3

Q.15 Alkaline earth metals form hydrated crystalline solids such as $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$, $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}$. This is due to –

- (A) Smaller ionic size
- (B) Increased charge on ions
- (C) Higher hydration enthalpies
- (D) High oxidation potential

Q.16 Hydrogen will not reduce –

- (A) heated cupric oxide
- (B) heated ferric oxide
- (C) heated stannic oxide
- (D) heated aluminium oxide

Q.17 What mass of hydrogen peroxide is present in 2 litre solution of 4M strength ? Calculate the volume of oxygen at S.T.P. liberated upon complete decomposition of 400 cm^3 of the above solution.

- (A) 172g, 0.92 L
- (B) 272g, 1.32 L
- (C) 272g, 17.92 L
- (D) 172g, 15.14 L

Q.18 Sodium oxide reacts with water violently forming NaOH. On heating above 400°C , it produces

- (A) Monoxide and peroxide
- (B) Monoxide and metallic sodium
- (C) Peroxide and metallic sodium
- (D) Monoxide and oxygen

Q.19 The stability of the following alkali metal chlorides follows the order –

- (A) $\text{LiCl} > \text{KCl} > \text{NaCl} > \text{CsCl}$
- (B) $\text{CsCl} > \text{KCl} > \text{NaCl} > \text{LiCl}$
- (C) $\text{NaCl} > \text{KCl} > \text{LiCl} > \text{CsCl}$
- (D) $\text{KCl} > \text{CsCl} > \text{NaCl} > \text{LiCl}$

Q.20 Which contains both polar and non-polar bonds

- (A) NH_4Cl
- (B) HCN
- (C) H_2O_2
- (D) CH_4

For Q.21-Q.25 :

The answer to each question is a NUMERICAL VALUE.

Q.21 Number of statement true regarding isolation of Na and K metal

- (i) These metals can be isolated by the reduction of their oxides
- (ii) These metals can be prepared from their aqueous salt solutions by metal displacement
- (iii) These metals can be prepared by the electrolysis of their aqueous salt solutions

(iv) These metals can be prepared by the electrolysis of their fused chlorides

Q.22 Number of true statement-

- (i) Sodium oxide is more basic than magnesium oxide
- (ii) Beryllium oxide is amphoteric
- (iii) The thermal stability of beryllium carbonate is more than that of calcium carbonate
- (iv) Beryllium is amphoteric

Q.23 Number of INCORRECT statement -

- (i) Lithium is softest among all the alkali metals
- (ii) Lithium possesses higher melting and boiling points
- (iii) It is least reactive among alkali metals
- (iv) It forms chloride which is soluble in alcohol

Q.24 Number of true statement-

- (i) Hydrogen is highly poisonous gas.
- (ii) Hydrogen peroxide is neutral like water.
- (iii) The boiling points NH_3 , H_2O and HF will be higher than the hydrides of their subsequent group members.
- (iv) Hydrogen peroxide is more stable in basic solution.

Q.25 Number of true statement-

- (i) Hydrogen peroxide can function as an oxidizing as well as reducing agent.
- (ii) Atomic hydrogen reduces H_2O_2 to H_2O and I_2 to HI .
- (iii) The reducing power of nascent hydrogen is more than that of atomic hydrogen.
- (iv) Sodium carbonate can remove only temporary hardness of water.

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