KNOWLEDGE HORIZON CLASSES

Test Series

Q1. In spinel structure, oxides ions are cubical-closest packed, whereas $1/8^{th}$ of tetrahedral holes are occupied by cations A^{2+} and ½ of octhadral holes are occupied by cations B^{3+} ions. The general formula of the compound having spinel structure is
(i) A_2BO_4 (ii) AB_2O_4
(iii) A_2B_4O (iv) A_4B_2O

Q2. Ionic solids tend to be
(i) good electrical conductors   (ii) soft
(iii) volatile   (vi) brittle

Q3. Raoult's law is obeyed by a binary liquid solution when
(i) the forces of attractions between like molecules are greater than those between unlike molecules
 (ii) the forces of attractions between like molecules are smaller than those between unlike molecules
(iii) the forces of attractions between like molecules are more or less identical with those between unlike molecules
(iv) the volume occupied unlike molecules are different

Q4. The elevation of boiling point of water produced by dissolving1.17 g sodium chloride in 100 g water ($K_b = 0.512$ K kg mol^{-1}) is
(i) 0.103 K   (ii) 0.205 K
(iii) 0.309 K   (iv) 0.410 K

Q5. At 25ºC, Eº for the reaction $Cu^{2+} + Sn\ (s) \rightarrow Cu(s) + Sn^{2+}$ is 0.45 V, the equilibrium constant for the reaction is
(i) 1.3×10^8
(ii) 6.8×10^4
(iii) 4.9×10^{20}
(iv) 1.8×10^{16}

Q6. A conductance cell when filled with 0.5 M KCl solution (conductivity = 6.67×10^{-3} Ω^{-1} cm^{-1}) registers a resistance of 243 Ω. Its cell constant is
(i) 1.62 cm

(ii) 1.62 cm^{-1}
(iii) 1.62 dm^{-1}
(vi) 1.62 m^{-1}

Q7. For a first order reaction involving decomposition of N_2O_5, the following information is available.

$$2N_2O_5(g) \rightarrow 4NO_2(g) + O_2(g) \qquad \text{rate} = k[N_2O_5]$$

$$N_2O_5(g) \rightarrow 2NO_2(g) + \frac{1}{2}O_2(g) \qquad \text{rate} = k'[N_2O_5]$$

   Which of the following expressions is true?
(i) $k = k'$ (ii) $k > k'$
(iii) $k < k'$ (iv) $k' = 2k$

Q8. For a first-order reaction, the ratio of times to complete 99.9% and half of the reaction is
(i) 8   (ii) 9
(iii) 10   (iv) 12

Q9. Which of the following statements is not correct?
(i) The efficiency of a solid catalyst depends upon its surface area
(ii) Catalyst operates by providing alternate path for the reaction that involves a lower energy of activation
(iii) Catalyst lowers the energy of activation of the forward reaction without affecting the energy of activation of the backward reaction
(iv) Catalyst does not affect the overall enthalpy change of the reaction

Q10. Cupellation is a process used for the refining of
(i) silver   (ii) lead
(iii) copper   (iv) iron

Q11. Which metal is obtained by self reduction process?
(i) Cu   (ii) Pb
(iii) Hg   (iv) All of these

Q12. Ammonia can be dried by
(i) conc. H_2SO_4 (ii) P_4O_{10}
(iii) anhydrous $CaCl_2$ (iv) anhydrous $CuSO_4$

Q13. Which of the following halides does not hydrolyse?
(i) NF_3 (ii) PCl_3
(iii) $AsCl_3$ (iv) $SbCl_3$

Q14. Which of the following ions forms white precipitate with H_2S?
(i) Co^{2+} (ii) Ni^{2+}
(iii) Mn^{2+} (iv) Zn^{2+}

Q15. When NH_4OH is added to the aqueous solution of $CuSO_4$, the compound crystallized after adding alcohol is
(i) $[Cu(NH_3)_4](OH)_2$ (ii) $[Cu(NH_3)_4]SO_4$
(iii) $[Cu(NH_3)_4]SO_4.H_2O$ (iv) $[Cu(NH_3)_4]SO_4.2H_2O$

Q16. Zeise's salt is
(i) $Fe(\eta^5-C_5H_5)_2$ (ii) $Cr(\eta^6-C_6H_6)_2$
(iii) $K[Pt(\eta^2-C_2H_4)Cl_3]$ (iv) $K[Pt(\eta^2-C_2H_4)Cl_3]$

Q17. Aryl halides are less reactive towards nucleophilic substitution reactions as compared to alkyl halides due to
(i)   the formation of less stable carbonium ion
(ii)   resonance stabilization
(iii) longer carbon-halogen bond
(iv) inductive effect

Q18. The order of reactivity of alcohol towards hydrogen halide is
(i) benzyl > 3º > 2º 1º   (ii) benzyl < 3º < 2º < 1º
(iii) 3º > 2º > 1º benzyl   (iv) 3º > 2º > benzyl > 1º

Q19. Given are the two cleavage reactions:
(a) $(CH_3)_3COCH_3 \rightarrow CH_3l+(CH_3)_3COH$

(b) $(CH_3)_3COCH_3 \rightarrow CH_3OH+(CH_3)_3Cl$

   (i) The reagent used in reaction (a) is anhydrous HI in ether and in reaction (b) is concentrated HI
   (ii) The reagent used in reaction (a) is concentrated Hl and in reaction (b) is anhydrous HI in ether
   (iii)The reagent used both in reactions (a) and (b) is concentrated HI
   (iv)The reagent used both in reactions (a) and (b) is anhydrous Hl in ether

Q20. The reagent which can be used to reduce –CHO to –CH_2OH without affecting the double bond in the unsaturated aldehydlic molecule is
(i) Zn/HCl   (ii) $LiAlH_4$
(iii) $NaBH_4$ (iv) N_2NNH_2