

## IIT-JEE-Chemistry-Screening-2005

1. Which species has the maximum number of lone pair of electrons on the central atom?  
(a)  $[\text{ClO}_3^-]$   
(b)  $\text{XeF}_4$   
(c)  $\text{SF}_4$   
(d)  $[\text{I}_3^-]$
2. Which kinds of isomerism is exhibited by octahedral  $\text{Co}(\text{NH}_3)_4\text{Br}_2\text{Cl}$ ?  
(a) Geometrical and ionization  
(b) Geometrical and optical  
(c) Optical and ionization  
(d) Geometrical only
3. Which is the most thermodynamically stable allotropic form of phosphorus?  
(a) red  
(b) white  
(c) black  
(d) yellow
4. Which ore contains both Iron and Copper?  
(a) Cuprite  
(b) Chalcocite  
(c) Chalcopyrite  
(d) Malachite
5. Which of the following is not oxidised by  $\text{O}_3$ ?  
(a) KI  
(b)  $\text{FeSO}_4$   
(c)  $\text{KMnO}_4$   
(d)  $\text{K}_2\text{MnO}_4$
6. Which one of the following statement for order of reaction is not correct?  
(a) Order can be determined experimentally  
(b) Order of reaction is equal to sum of the power of concentration terms in differential rate law  
(c) It is not affected with stoichiometric coefficient of the reactants  
(d) Order can not be fractional
7. How will you convert butan-2-one to propanoic acid?  
(a) Tollen's reagent  
(b) Fehling solution  
(c)  $\text{NaOH}/\text{I}_2/\text{H}^+$   
(d)  $\text{NaOH}/\text{NaI}/\text{H}^+$
8. Which blue-liquid is obtained on reacting equimolar amounts of two gases at  $-30^\circ\text{C}$ ?  
(a)  $\text{N}_2\text{O}$

- (b) N<sub>2</sub>O<sub>3</sub>
- (c) N<sub>2</sub>O<sub>4</sub>
- (d) N<sub>2</sub>O<sub>5</sub>

9. Which of the following resonating structures of 1-methoxy-1, 3-butadiene is least stable?

- (a) CH<sub>2</sub>—CH=CH—CH=O—CH<sub>3</sub>
- (b) CH<sub>2</sub>=CH<sub>2</sub>—CH—CH=O—CH<sub>3</sub>
- (c) CH<sub>2</sub>—CH—CH=CH—O—CH<sub>3</sub>
- (d) CH<sub>2</sub>=CH—CH—CH—O—CH<sub>3</sub>

10. The ratio of the rate of diffusion of helium and methane under identical condition of pressure and temperature will be:

- (a) 4
- (b) 2
- (c) 1
- (d) 0.5

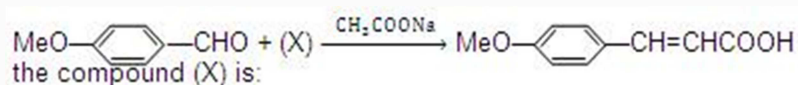
11. When PbO<sub>2</sub> reacts with conc. HNO<sub>3</sub> the gas evolved is:

- (a) NO<sub>2</sub>
- (b) O<sub>2</sub>
- (c) N<sub>2</sub>
- (d) N<sub>2</sub>O

12. In which of the following crystals alternate tetrahedral voids are occupied?

- (a) NaCl
- (b) ZnS
- (c) CaF<sub>2</sub>
- (d) Na<sub>2</sub>O

13.



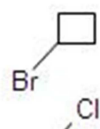
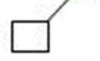


- (a) CH<sub>3</sub>—COOH
- (b) BrCH<sub>2</sub>—COOH
- (c) (CH<sub>3</sub>CO)<sub>2</sub>O
- (d) CHO—COOH

14. The elevation in boiling point of a solution of 13.44 g of CuCl<sub>2</sub> in 1 kg of water using the following information will be:

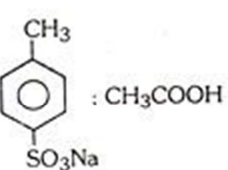
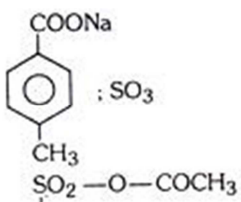
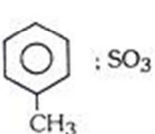
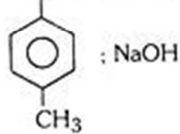
(Molecular weight of CuCl<sub>2</sub> = 134.4 and K<sub>b</sub> = 0.52 K molal<sup>-1</sup>)

- (a) 0.16
- (b) 0.05
- (c) 0.1
- (d) 0.2

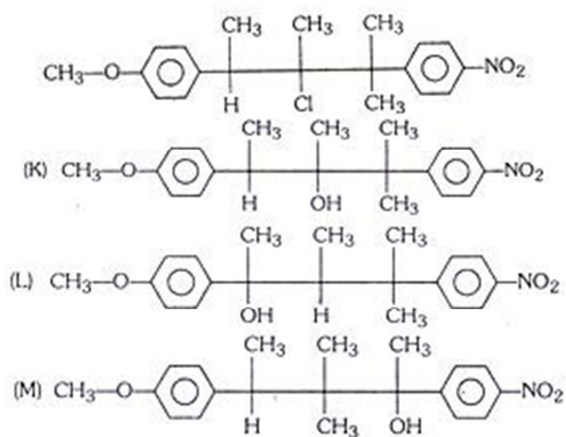
15. What would be the product formed when 1-bromo-3-chloro cyclobutane reacts with two equivalents of metallic sodium in ether?

- (a) 
- (b) 
- (c) 
- (d) 

16. 4-methyl benzene sulphonic acid reacts with sodium acetate to give :

- (a)  :  $\text{CH}_3\text{COOH}$
- (b)  :  $\text{SO}_3$
- (c)  :  $\text{SO}_3$
- (d)  :  $\text{NaOH}$

17. The following on hydrolysis in aqueous acetone will give :

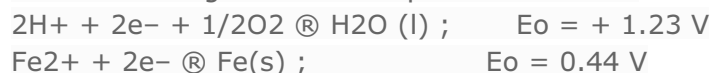


- (a) Mixture of (K) and (L)
- (b) Mixture of (K) and (M)
- (c) only (M)
- (d) only (K)

**18.** 0.1 mole of  $\text{CH}_3\text{NH}_2$  ( $K_b = 5 \times 10^{-4}$ ) is mixed with 0.08 mole of  $\text{HCl}$  and diluted to one litre. What will be the  $\text{H}^+$  concentration in the solution?

- (a)  $8 \times 10^{-2}$  M
- (b)  $8 \times 10^{-11}$  M
- (c)  $1.6 \times 10^{-11}$  M
- (d)  $8 \times 10^{-5}$  M

**19.** The rusting of iron takes place as follows :



Calculate  $\Delta G_o$  for the net process

- (a)  $-322 \text{ kJ mol}^{-1}$
- (b)  $-161 \text{ kJ mol}^{-1}$
- (c)  $-152 \text{ kJ mol}^{-1}$
- (d)  $-76 \text{ kJ mol}^{-1}$

**20.** Name of the structure of silicates in which three oxygen atoms of  $[\text{SiO}_4]^{4-}$  are shared is :

- (a) pyrosilicate
- (b) sheet silicate
- (c) linear chain silicate
- (d) three dimensional silicate

**21.** Lyophilic sols are :

- (a) irreversible sols
- (b) they are prepared from inorganic compounds
- (c) coagulated by adding electrolytes
- (d) self-stabilizing

**22.** Which pair of compounds is expected to show similar colour in aqueous medium?

- (a)  $\text{FeCl}_3$  and  $\text{CuCl}_2$
- (b)  $\text{VOCl}_2$  and  $\text{CuCl}_2$
- (c)  $\text{VOCl}_2$  and  $\text{FeCl}_2$
- (d)  $\text{FeCl}_2$  and  $\text{MnCl}_2$

**23.** The two forms of D-glucopyranose obtained from the solution of D-glucose are called :

- (a) isomer

- (b) anomer
- (c) epimer
- (d) enantiomer

**24.** The number of radial nodes of 3s, and 2p orbitals are respectively :

- (a) 2, 0
- (b) 0, 2
- (c) 1, 2
- (d) 2, 1

**25.** A metal nitrate reacts with KI to give a black precipitate which on addition of excess of KI convert into orange colour solution. The cation of metal nitrate is:

- (a)  $\text{Hg}^{2+}$
- (b)  $\text{Bi}^{3+}$
- (c)  $\text{Pb}^{2+}$
- (d)  $\text{Cu}^{+}$

**26.** When phenyl magnesium bromide reacts with t-butanol, the product would be:

- (a) benzene
- (b) phenol
- (c) t-butyl benzene
- (d) t-butyl phenyl ether

**27.** The best method to prepare cyclohexene from cyclohexanol is by using :

- (a) conc. HCl +  $\text{ZnCl}_2$
- (b) conc.  $\text{H}_3\text{PO}_4$
- (c) HBr
- (d) conc. HCl

**28.** When one mole of monoatomic ideal gas at T K undergoes adiabatic change under a constant external pressure of 1 atm changes volume from 1 litre to 2 litre. The final temperature in kelvin would be :

- (a)  $T/2^{(2/3)}$
- (b)  $T + 2/(3 \times 0.0821)$
- (c) T
- (d)  $T - 2/(2 \times 0.0821)$