

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) XeF_4
- (c) 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 O_3 ?

- (a) KI
- (b) FeSO_4
- (c) KMnO_4
- (d) K_2MnO_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°C ?

- (a) N_2O

- (b) N₂O₃
- (c) N₂O₄
- (d) N₂O₅

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

- (a) CH₂—CH=CH—CH=O—CH₃
- (b) CH₂=CH₂—CH—CH=O—CH₃
- (c) CH₂—CH—CH=CH—O—CH₃
- (d) CH₂=CH—CH—CH=O—CH₃

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

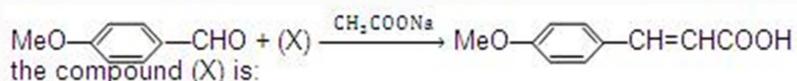
11. When PbO₂ reacts with conc. HNO₃ the gas evolved is:

- (a) NO₂
- (b) O₂
- (c) N₂
- (d) N₂O

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

- (a) NaCl
- (b) ZnS
- (c) CaF₂
- (d) Na₂O

13.



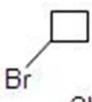
- (a) CH₃—COOH
- (b) BrCH₂—COOH
- (c) (CH₃CO)₂O
- (d) CHO—COOH

14. The elevation in boiling point of a solution of 13.44 g of CuCl₂ in 1 kg of water using the following information will be:

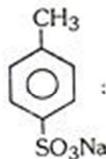
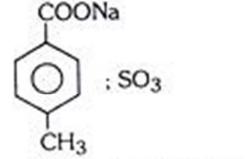
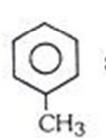
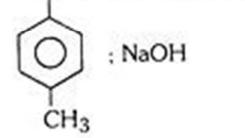
(Molecular weight of CuCl₂ = 134.4 and K_b = 0.52 K molal⁻¹)

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

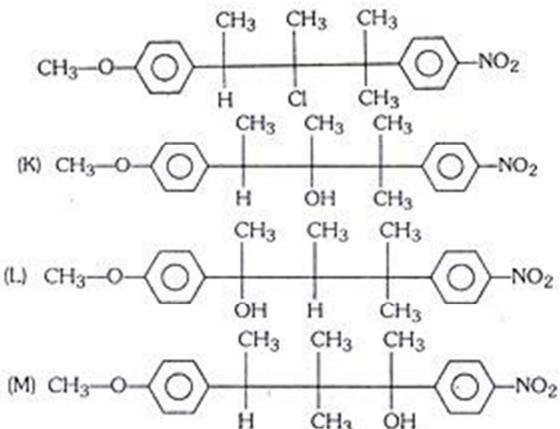
15. What would be the product formed when 1-bromo-3-chloro cyclobutane reacts with two equivalents of metallic sodium in ether?

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

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

- (a)  : CH₃COOH
- (b)  ; SO₃
- (c)  ; SO₃
- (d)  ; 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 CH_3NH_2 ($K_b = 5 \times 10^{-4}$) is mixed with 0.08 mole of HCl and diluted to one litre. What will be the H^+ concentration in the solution?

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

19. The rusting of iron takes place as follows :



Calculate ΔG°_f for the net process

- (a) -322 kJ mol $^{-1}$
- (b) -161 kJ mol $^{-1}$
- (c) -152 kJ mol $^{-1}$
- (d) -76 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) FeCl_3 and CuCl_2
- (b) VOCl_2 and CuCl_2
- (c) VOCl_2 and FeCl_2
- (d) FeCl_2 and 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) Hg^{2+}
- (b) Bi^{3+}
- (c) Pb^{2+}
- (d) 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 + ZnCl_2
- (b) conc. H_3PO_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) $T - 2/(2 \times 0.0821)$