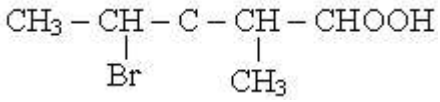
CHEMISTRY

1. Write IUPAC name of :-



2. Define the following term term (a) Mass percentage (b) Molarity

3. Express the relationship between degree of dissociation of an electrolyte and its molar conductivities.

4. One heating crystal of Kcl in potassium vapour, the crystals start exhibiting a violet colour. Why ?

5. Write the four quantum numbers of unpaired electron of copper atom in the ground state (Atomic no. 29)

6. (a) Explain why the aromatic amines are less baric than ammonia and aliphatic amines.
(b) Discuss the role of redox phenomenon in the context of rocket propellant.

7. (a) Write name of $[CO(NH_3)_5\ NO_2]Cl_2$
(b) What in the condition to be satisfied for a compound to be chiral.

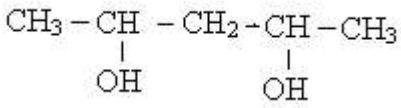
8. What is meant by catenation? How does the catenation tendency for element of group -14 vary ?

9. Mention two properties of acetonitriles because of which its acts as a good solvent.

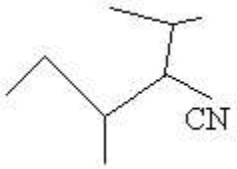
10. What one fibrous and globular protein? Give one example each.

11. Write the structure of the monomers used for getting the polymers, (a) Polystyrene (b) Neoprene (c) Nylon-6 (d) PTFE.

12. Identify and indicate the presence of centre of chirality in the following molecule:-
(a)



(b)



13. (a) what may be the new neutron and proton ratio after a nuclide $^{238}U_{92}$ losses an α - particle ?
(b) What is meant by B-emission in nuclear chemistry.

14. Explain the following giving suitable example:-
(a) Kolbe's reaction.
(b) Hoffman bromamide reaction.

15. (a) Give the IUPAC name of [Pt Cl (NH_2CH3) $(NH_3)2\}$]Cl
(b) What complex formation is used in the identification of N_2^{24} Ions qualitative analysis?

16. (a) Calculate the magnetic moment of Fe^{3+} (at no of Fe = 26).
(b) Why do the transition elements exhibit higher enthalpies of atomization?

17. (a)How are the following conversion carried out---

(i) Propane → propan – 2 – ol. (ii) 2-nitro propane to a acetone?

(b) Write the mode of free radical addition polymerization of an alkene clearly indicate the role of an initiator it.

18. (a) How are antiseptics distinguished from disinfectants? Give two example of each of the substance.

(b) What is mordant dye? How is it applied to the fayrics?

(c) Describe Transquiliser or Antaacid.

19. (a) Explain what is observed.

(i) When a beam of light is passed through a colloidal solution.

(ii) An electrolyte NaCl is added to ferric hydroxide solution.

(b) What is – (a) Electrophoresis (b) Peptization (c) Lyophobic Solution.

(a) The standard gibb's energies of formation (ΔG_f^o) of SOL(g) and So_3(g) are -300.0 KJ/mol and -371.1 KJ/mol at 300 K respectively.

Calculate Δ G and equilibrium constant for the following reaction at 300 k

$$2SO_2(g)+O_2(g)\Rightarrow 2SO_3(g)$$

(b) Explain why entropy of a perfectly crystalline substance is less than that of its imperfect crystals?

20. Conductivity of 0.00242 M acetic acid is 7.86 x 10^{-5} $scm^{-1.}$ Calculate its molar conductivity .If λ_0 for acetic acid is 390.5 s cm^2 mol^{-1}. What is its dissociation constant?

21. (a) Two elements A and B form compounds having molecular formulae AB_2 and AB_4. When dissolved in 20 g of benzene 1 g of AB_2 lowers the freezing point by 2.3 k whereas1gm of AB_4 lower its by 1.3k. The molar depression constant for benzene its 5.1 kg mol^{-1} .Calculate the atomic masses of A and B.

(b) What information is given by (1) Radial probability density R^2 (2) Radial probability function $4\pi r^2 R^2$ in hydrogen atom. How do they vary with r for 1s orbital of hydrogen atom? Show diagrammatically?

22. Calculate the density of silver which crystallizes in the face centered cubic structure. The distance between the nearest silver atoms in this structure is 287 picometre. Molor mass of Ag = 107.87 g/mole, N_A = 6.022 x 10^{23} mol^{-1}.

23. (a) Calculate the de-brogile wave length of an electron that has been accelerated form rest through a potential difference of 1kv.

(b) Draw a diagram showing the formation of bonding and anti-bonding molecular orbital by the LCAO in mono nuclear hydrogen molecules.

24. Give reason for each of following:-

(a) Solid phosphorus penta chloride exhibits some ionic character.

(b) +1 oxidation state is more stable than the +3 Oxidation state for thallium.

(c) Fluorine is the strongest oxidant amongst the halogens.

(d) Phosphoric acid behaves as a monoprotic acid.

OR

(a) H_2S has a stronger reducing behaviour in comparison to that of H_2O.

(b) Ammonia is more baric than phosphine.

(c) HF is the weakest acid thanHI.

(d) Complete the following :-

(1) $Ca_3P_2 + H_2O \rightarrow$

(2) $XeF_4 + SbF_5 \rightarrow$

(3) $SiCl_4 + H_2O \rightarrow$

25. (a) Enzmel catalysts are highly specific in their action?

(b) Two strands of DNA are complementary and not identical ". Explain this statement.

(c) Hormone's are chemical messenger". Explain this statement?

OR

(a) Explain mutarotation? Give its mechanism in case of D-glucose.

(b) Comment briefly on the chemical nature of Insulin and its physiological activity.

(c) What is glycosidic bond? Illustrate its formation with an example?

26. (a) Calculate the cell potential for the following cell at 25°C

$Zn(S)/Zn^{(2+)}$ (0.10M) || Sn^{2+} (0.011M/ Sn(s)

$E^oZn^2+/Zn = -0.76V$, $E^oSn^2+/sn = 0.144V$)

$R = 8.31\ JK^{-1}Mol^{-1}$, $F = 95600\ C\ mol^{-1}$)

(b) What are fuel cells? With the help of diagram describe the working of a fuel cell.

27. (a)Write the reaction that occurs in a storage battery during discharging and charging.

(b) The rate constant for first order reaction is $60s^{-1}$. How much time will it take to reduce the initial concentration of the reactant of its $1/16^{th}$ value?