INDIAN SCHOOL SOHAR
PRE BOARD EXAM 2015-2016
CHEMISTRY

STD: XII   MARKS: 70
Date: 10-1-2016   TIME: 3 Hrs

Instructions:
1. *All questions are compulsory.*
2. *Question nos. 1-5 are very short answer questions and carry 1 mark each.*
3. *Question nos. 6-10 are short answer questions and carry 2 marks each.*
4. *Question nos 11-22 are short answer questions and carry 3 marks each.*
5. *Question no. 23 is value based question and carry 4marks.*
6. *Question nos. 24-26 are long answer questions and carry 5 marks each.*
7. *Write serial no. of the question before attempting it.*
8. *Use log tables for calculations.*

1. Define Kraft temperature.

2. What are F-centres?

3. Write the structural formula of 2-methoxy-2-methylpentan-3-one.

4. Draw the geometric isomers of $[Pt(NH_3)_4Cl_2]^{2+}$.

5. Identify the chiral molecule in the following pair of compounds:

6. Differentiate between the following :
   a) Elastomers and fibres   b) Addition and condensation polymerization

7. The reaction $SO_2Cl_2 \rightarrow SO_2 + Cl_2$ is a first order reaction with a rate constant of
   2.2×10^{-5} s^{-1} at 573K. What percent of SO_2Cl_2 is decomposed on heating at 573 K for 90 min?

8. CaF_2 has fcc structure. The edge length of the unit cell is 5.46×10^{-8} cm . Calculate the
   density if molar mass of CaF_2 is 78 g mol^{-1}.   ($N_o = 6.02 \times 10^{23}$)

9. Complete the following chemical equations for reactions in aqueous media:
   a) $Cr_2O_7^{2-} + H^+ + Fe^{2+}$ →
   b) $MnO_4^- + C_2O_4^{2-} + H^+$ →

10.a) How is ozone estimated quantitatively?
   b) What inspired Neil Bartlett for carrying out reaction between Xe and PtF_6?
                                        OR
       Explain the theory of Brown ring test for the detection of nitrate ion giving the reactions.

11.a) How are the given polymers prepared?   i) Nylon-6   ii) Terylene
   b) What is meant by copolymerization?

12. What is meant by adsorption isotherm? Explain Freundlich adsorption isotherm.

13. What is crystal field splitting energy? How does the magnitude of Δ_o decide the actual configuration of d orbitals in a coordination entity?

14. a) Differentiate between fibrous and globular proteins.
    b) Explain the meaning of the given terms: i) Invert sugar   ii) Polypeptide

15. a) Differentiate between antiseptics and disinfectants.
    b) What are non-ionic detergents? Give its use.
    c) What is meant by broad spectrum antibiotics?

                                    OR

    a) Why is bithional added to soap?
    b) Explain drug-enzyme interaction.

16. a) Explain the role of the following in metallurgy:
        i) KCN in the extraction of silver
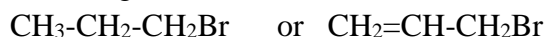   ii) SiO_2 in the extraction of copper.
    b) What are depressants? Give an example.

17. a) Identify X and Y in the following reaction:

    $$CH_3\text{-}CH\text{=}CH_2 + HBr \xrightarrow{} X \xrightarrow{AgNO_2} Y$$

    b) Why is chloroform stored in dark coloured bottles?
    c) Which of the following is more reactive towards S_N1 mechanism and why?
                $CH_3\text{-}CH_2\text{-}CH_2Br$ or $CH_2\text{=}CH\text{-}CH_2Br$

18. a) State Raoult's law for a mixture of two liquids.
    b) A solution containing 30g of a non-volatile solute in 90g of water has a vapour pressure of 2.8 kPa at 298K. When 18g of water is added to the solution, the new vapour pressure becomes 2.9 kPa at 298K. Calculate
     i) molar mass of the solute ii) vapour pressure of water at 298K. (At. Mass of H=1, O=16)

19. a) Calculate the overall order of the reaction if rate expression is Rate $= k[A]^{1/3}[B]^{2/3}$.
    b) Explain the effect of catalyst on the rate of reaction and represent it graphically.

20. a) Differentiate between antiferromagnetism and ferrimagnetism and give examples.
    b) What is meant by doping?
    c) Write the relationship between radius 'r' and cell edge length 'a' in bcc structure.

21. a) Would you expect benzaldehyde to be more reactive or less reactive than propanal towards nucleophilic addition reactions.
    b) Illustrate the following with an example:
     i) Wolff- Kishner reduction   ii) Gatterman-Koch reaction.

22. Account for the following:
     a) Mn(II) ion shows maximum paramagnetic character amongst the bivalent ions of first transition series. (Z $= 25$)
     b) Transition metals form large number of complexes
     c) E^o values for Mn, Ni and Zn are more negative than expected.

23. Natural sweeteners add to calorie intake and therefore cannot be used by diabetic patients. Such people use artificial sweeteners. These are boon for people who want to control their calorie intake.
     a) What is the advantage of using saccharin?
     b) Why is the use of aspartame limited to cold food and soft drinks?

c) What is the drawback of alitame? Which is better artificial sweetener than alitame and why?

d) What are the values possessed by people taking less sugar?

24. Account for the following:

a) Though nitrogen exhibits +5 oxidation state, it does not form pentahalides.

b) Covalent flourides are more inert than other covalent halides.

c) In solid state PCl_5 behaves as an ionic species.

d) Valency of oxygen is generally 2 whereas sulphur shows valency of 2, 4 and 6.

e) White phosphorous is more reactive than red phosphorous.

OR

a) Write chemical equation for the following reactions:

i) White phosphorous is heated with NaOH solution in an inert atmosphere of CO_2 gas.

ii) NaCl is heated with sulphuric acid in the presence of MnO_2.

iii) XeF_6 is hydrolysed.

b) Draw the structures of the following molecules:

i) N_2O_5 b) XeF_6

25.a) The cell in which the reaction $2Fe^{3+}(aq) + 2I^-(aq) \longrightarrow 2Fe^{2+}(aq) + I_2(s)$ occurs has $E^o = 0.236V$ at 298 K. Calculate the standard Gibbs energy and equilibrium constant of the cell reaction.

b) What are secondary cells? Write the chemistry of recharging the lead storage battery, highlighting all the materials that are involved during recharging.

OR

a) The resistance of a conductivity cell filled with 0.1mol Lt^{-1} KCl solution is 100 Ω . If the resistance of the same cell when filled with 0.02 mol Lt^{-1} KCl solution is 520 Ω. Calculate the conductivity and molar conductivity of 0.02 mol Lt^{-1} KCl solution. The conductivity of 0.1 mol Lt^{-1} KCl solution is 1.3×10^{-2} $\Omega^{-1}cm^{-1}$.

b) What is nickel-cadmium cell? State its one advantage and one disadvantage over lead storage cell. Write the overall reaction that occurs during discharging of this cell.

26.a) Explain the following giving reason in each case.

i) Why is alkylamine more basic than NH_3?

ii) Why do 1° amines have higher B.P than 3° amines?

b) Write one chemical reaction each to illustrate the following:

i) Gabriel phthalimide synthesis   ii) Acetylation   iii) Coupling reaction

OR

a) How are the following conversions carried out?

i) Aniline to iodobenzene   ii) Ethylnitrile to ethylamide

iii) Benzene diazonium chloride to benzonitrile

b) State distinguishing test for the following pairs of compounds:

i) Ethylamine and aniline   ii) Methylamine and dimethylamine

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