EQUILIBRIUM CLASSES

Chemistry by Anuj sir

CLASS XII
SAMPLE PAPER
CHEMISTRY

Time Allowed : 3 Hrs. Maximum Marks : 70

General Instructions :

1. All questions are compulsory.
2. Question Nos. 1 to 5 are very short answer questions and carry 1 mark each.
3. Question Nos. 6 to 12 are short answer questions and carry 2 mark each.
4. Question Nos. 13 to 24 are short answer questions and carry 3 mark each.
5. Question Nos. 25 to 27 are long answer questions and carry 5 mark each.
6. Use log tables if necessary, use of calculators is not allowed.
7. [log2=0.3010 ,log3=.4771, log 5=.6991, log7=.8450, R=0.0821L atm k^{-1} mol^{-1}]

Q1) How many effective sodium ions are located at the centres of the faces of a unit cell in sodium chloride crystal?

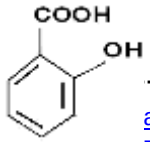
OR

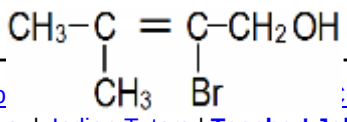
Write IUPAC name of $K_4[Fe(CN)_6]$

Q2) What do you observe when Red Blood corpuscles are placed in
(i) 1% NaCl Solution (ii) 0.5% NaCl Solution?

Q3) Give reason for the "blue colour of the sky".

Q4) Give the role cryolite in the metallurgy of aluminium.





Q5) Write I.U.P.A.C. name for, (A) (B)

Q6) Name the monomer from which Nylon – 6 is manufactured.

Q7) What is Zwitter – ion?

Q8) Complete the following; $CH_3 - CH_2 - NH_2 \xrightarrow{HNO2}$

Q9) Distinguish between:
(i) Hexagonal Close packing and cubic close packing.
(ii) Tetrahedral void and Octahedral void.

Q10) Niobium crystallizes in body centred cubic structure. If density is 8.55 gcm^{-3}, calculate atomic radius of niobium using its atomic mass 93U.

OR

Calculate the EMF of the cell at 25°C
(a) Ni/Ni^{2+} (0.1M) // Cu^{2+} (0.1M) / Cu
E^oNi^{2+}/Ni = - 0.25 V
E^oCu^{2+} / Cu = 0.34 V

Q11) 45g of ethylene glycol ($C_2H_6O_2$) is mixed with 600gm of water. Calculate (a) the freezing point depression and (b) the freezing point of the solution.

Q12) The standard electrode potential for Danial Cell is 1.1V. Calculate the Standard Gibbs energy for the reaction : $\Delta rG^o = - RT \ln K$

Q13) Why do the transition elements exhibit higher enthalpies of atomization?

OR

How many hours does it take to reduce 3 mole of Fe^{3+} to Fe^{2+} with 2 Ampere current
1F = 96500 e^-

Q14) $[NiCl_4]^{2-}$ is paramagnetic while $[Ni(CO)_4]$ is diamagnetic though both are tetrahedral. Why?

Q15) What happens when :
(i) Ethyl chloride is treated with aqueous KOH?
(ii) Chlorobenzene is subjected to hydrolysis.

Q16) Explain why :

1. chloroform is kept in air tight dark coloured bottles?
2. Grignard reagents should be prepared under anhydrous conditions?

Q17) Explain the difference between Buna – N and Buna – S.

Q18) Define thermoplastics and thermosetting polymers with two examples of each.

OR

Conductivity of 0.00241 M acetic acid is 7.896×10^{-5} SCm^{-1}. Calculate Molal conductivity if λ_m for CH_3COOH is 390.55 cm^2mol^{-1}. What is dissociation constant?

Q19) What are Biodegradible polymers ? Give one examples of synthetic biodegradable polymer .

OR

Give the chemical equation involved in the reparation of potassium dichromate from chromite ore.

Q20) Calculate the mole fraction of ethylene glycol ($C_2H_6O_2$) in a solution containing 20% of $C_2H_6O_2$ by mass.

Q21) Depict the galvanic cell in which the reaction, $Zn(s) + 2Ag^+(aq) \rightarrow Zn^{2+}(aq) + 2Ag(s)$ takes place.

(i) Which of the electrode is negatively charged?
(ii) The carriers of the current in the cell.
(iii) Individual reaction of each electrode.

Q22) Distinguish between physisorption and chemisorptions.

Q23) Why is the extraction of copper from pyrites more difficult than that from its oxide are through reduction?

Q24) What happens when :

(i) Concentrated H_2SO_4 is added to calcium floride?
(ii) SO_3 is passed through water?

Q25) Write balanced equation for the following:

(i) NaCl is heated with sulphuric acid in the presence of MnO_2.
(ii) Chlorine gas is passed into a solution of NaI in water.

OR

Account for the following :

(a) E^o for Mn^{3+}/Mn^{2+} couple is more positive than for Fe^{3+}/Fe^+.
(b) Zn^{2+} salts are white while Cu^{2+} salts are coloured.
(c) Ce^{3+} can easily oxidized to Ce^{4+}.
(d) Zr and Hf exhibit almost similar properties.
(e) Transition elements show variable oxidation states.

Q26) Write the equation involved in the followed reactions :

(i) Reimer – Tiemann Reaction.
(ii) Kolbe's Reaction
(iii) Williamson ether synthesis.

OR

(a) Write balanced equation for the following :
1) $NaClO_3$ is treated with SO_2.
2) Ca_3P_2 is treated with water.

(b) Give reason :
(i) CO_2 is gas while SiO_2 is solid.
(ii) $SbCl_5$ is more covalent than $SbCl_3$.
(iii) Interhalogen compounds are more reactive than pure halogen.

Q27) Give the structure of A, B and C in the following reaction :

(i) $CH_3CH_2I \xrightarrow{NaCN} A \xrightarrow[\text{Partial hydrolysis}]{OH^-} B \xrightarrow{NaNO_2 + Br_2} C$

(ii) $CH_3COOH \xrightarrow[\Delta]{NH_2} A \xrightarrow{NaOBr} B \xrightarrow{NaNO_2/HCl} C$

(iii) $C_6H_5NO_2 \xrightarrow{Fe/NHCl} A \xrightarrow[273K]{HNO_2} B \xrightarrow{C_6H_5OH} C$

OR

(a) Deduce the structure of XeF_4 and XeO_3 by applying VSEPR theory.
(b) Arrange the following in the order of property indicated.
(i) HOCl, $HOClO$, $HOClO_2$, $HOClO_3$ (decreasing acid strength)
(ii) NH_3, PH_3, ASH_3, SbH_3 (decreasing basic strength)
(iii) M – F, M – Cl, M – Br, M – I (decreasing ionic character