

EQUILIBRIUM CLASSES

CLASS XII

SAMPLE PAPER

SUB: CHEMISTRY

TIME :3 Hr

M.M 70

All questions are compulsory.

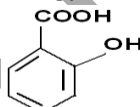
Question Nos. 1 to 5 are very short answer questions and carry 1 mark each.

Question Nos. 6 to 10 are short answer questions and carry 2 mark each.

Question Nos. 11 to 22 are short answer questions and carry 3 mark each.

Question Nos. 23 carry 4 mark each

Question Nos. 24 to 26 are long answer questions and carry 5 mark each

- Q1) How many effective sodium ions are located at the centres of the faces of a unit cell in sodium chloride crystal?
- 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)  $\text{CH}_3-\text{C}(\text{CH}_3)=\text{C}(\text{Br})-\text{CH}_2\text{OH}$
- Q6) Name the monomer from which Nylon – 6 is manufactured.
- Q7) What is Zwitter – ion?
- Q8) Distinguish between:
(i) Hexagonal Close packing and cubic close packing
(ii) Tetrahedral void and Octahedral void.
- Q9) Niobium crystallizes in body centred cubic structure. If density is 8.55 g cm^{-3} , calculate atomic radius of niobium using its atomic mass 93U.
- Q10) 45g of ethylene glycol ($\text{C}_2\text{H}_6\text{O}_2$) is mixed with 600gm of water. Calculate (a) the freezing point depression and (b) the freezing point of the solution.
- Q11) The standard electrode potential for Danial Cell is 1.1V. Calculate the Standard Gibbs energy for the reaction : $\Delta_r G^\circ = - RT \ln K$ OR
(i) Calculate the EMF of the cell at 25°C $\text{Ni/Ni}^{2+} (0.1\text{M}) // \text{Cu}^{2+} (0.1\text{M}) / \text{Cu}$
 $E^\circ_{\text{Ni}^{2+}/\text{Ni}} = - 0.25 \text{ V}$ $E^\circ_{\text{Cu}^{2+} / \text{Cu}} = 0.34 \text{ V}$
(ii) How many hours does it take to reduce 3 mole of Fe^{3+} to Fe^{2+} with 2 Ampere current $1\text{F} = 96500 \text{ e}^-$
- Q12) Why do the transition elements exhibit higher enthalpies of atomization?
- Q13) $[\text{NiCl}_4]^{2-}$ is paramagnetic while $[\text{Ni}(\text{CO})_4]$ is diamagnetic though both are tetrahedral. Why?

- Q14) What happens when : (i) Ethyl chloride is treated with aqueous KOH?
(ii) Chlorobenzene is subjected to hydrolysis.
- Q15) Explain the difference between Buna – N and Buna – S.
- Q16) Define thermoplastics and thermosetting polymers with two examples of each.
- Q17) What are food preservatives? Give one examples.
- Q18) Calculate the mole fraction of ethylene glycol (C₂H₆O₂) in a solution containing 20% of C₂H₆O₂ by mass.
- Q19) Depict the galvanic cell in which the reaction, $Zn(s) + 2Ag^+(aq) \longrightarrow Zn^{2+}(aq) + 2Ag(s)$ 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.
- Q20) Distinguish between physisorption and chemisorptions.
- Q21) Why is the extraction of copper from pyrites more difficult than that from its oxide are through reduction? OR
Conductivity of 0.00241 M acetic acid is $7.896 \times 10^{-5} \text{ S cm}^{-1}$. Calculate Molal conductivity if λ_m for CH₃COOH is $390.55 \text{ cm}^2 \text{ mol}^{-1}$. What is dissociation constant?
- Q22) What happens when :
(i) Concentrated H₂SO₄ is added to calcium fluoride? (ii) SO₃ is passed through water?
- Q23) Account for the following :
(i) E° for Mn³⁺/Mn²⁺ couple is more positive than for Fe³⁺/Fe²⁺.
(ii) Zn²⁺ salts are white while Cu²⁺ salts are coloured.
(iii) Ce³⁺ can easily oxidized to Ce⁴⁺.
(iv) Zr and Hf exhibit almost similar properties.
(v) Transition elements show variable oxidation states.
OR
(a) Give the chemical equation involved in the reparation of potassium dichromate from chromite ore.
(b) Write down the effect of P^H on K₂Cr₂O₇.
(c) Define lanthanoid contraction.
- Q24) Write the equation involved in the followed reactions :
(i) Reimer – Tiemann Reaction..
(ii) Kolbe’s Reaction (iii) Williamson ether synthesis.
- Q25) Give the structure of A, B and C in the following reaction :
- $$\text{CH}_3\text{CH}_2\text{I} \xrightarrow{\text{NaCN}} \text{A} \xrightarrow[\text{Partial hydrolysis}]{\text{OH}^-} \text{B} \xrightarrow{\text{NaNO}_2 + \text{Br}_2} \text{C}$$
- $$\text{CH}_3\text{COOH} \xrightarrow[\Delta]{\text{NH}_2} \text{A} \xrightarrow{\text{NaOBr}} \text{B} \xrightarrow{\text{NaNO}_2/\text{HCl}} \text{C}$$
- $$\text{C}_6\text{H}_5\text{NO}_2 \xrightarrow[273\text{K}]{\text{Fe/HCl}} \text{A} \xrightarrow{\text{HNO}_2} \text{B} \xrightarrow{\text{C}_6\text{H}_5\text{OH}} \text{C}$$
- Q26) (a) Deduce the structure of XeF₄ and XeO₃ by applying VSEPR theory.
(b) Arrange the following in the order of property indicated.

- (i) HOCl, HOClO, HOClO₂, HOClO₃ (decreasing acid strength)
- (ii) NH₃, PH₃, ASH₃, SbH₃ (decreasing basic strength)
- (iii) M – F, M – Cl, M – Br, M – I (decreasing ionic character)

OR

(a) Write balanced equation for the following :

- (i) NaClO₃ is treated with SO₂.
- (ii) Ca₃P₂ is treated with water.

(b) Give reason :

- (i) CO₂ is gas while SiO₂ is solid.
- (ii) SbCl₅ is more covalent than SbCl₃.
- (iii) Interhalogen compounds are more reactive than pure halogen.

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