

Sample Paper – 2014
Class – XII
Subject – Chemistry

Time: 3 hours

Maximum marks: 70

TOTAL NO OF PRINTED PAGE: 3 SUB: (043)

Code :56/043/1

General instructions:

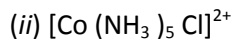
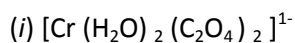
- 1) All questions are compulsory.
- 2) Marks for each question are indicated against it.
- 3) Question number 1 to 8 are very short –answer questions, carrying 1 mark each. Answer these in one word or about one sentence each.
- 4) Question number 9 to 18 are short –answer questions, carrying 2 marks each. Answer these in about 30 words each.
- 5) Question number 19 to 27 are short –answer questions, carrying 3 marks each. Answer these in about 40 words each.
- 6) Question number 28 to 30 are long-answer questions of 5 marks each. Answer these in about 70 words each.
- 7) Use log tables, if necessary. Use of calculators is not permitted.

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|-----|---|---|
| Q1. | Give the IUPAC name of the following compound. $(\text{CH}_3)_3\text{CCH}=\text{CIC}_6\text{H}_4\text{I-p}$ | 1 |
| Q2 | Write the IUPAC name and use of Wilkinson catalyst. | 1 |
| Q3. | Write the method of preparation of XeF_4 . | 1 |
| Q4. | Anisole reacts with HI to give phenol and methyl iodide and not iodobenzene and methylalcohol. Give reason. | 1 |
| Q5 | Draw the structures of the Hex-2-en-4-ynoic acid. | 1 |
| Q6. | What happens when D Glucose is treated with Br_2 water ? | 1 |

- Q7. Define emulsifying agent, give one example of W/O emulsifying agent. 1
- Q8. Define Rate constant . 1
- Q9. a. Why molar conductivity increases sharply with increase in dilution for weak electrolyte? 2
b. Predict the products of electrolysis of an aqueous solution of CuCl_2 with platinum electrodes.
- Q10. Explain the following terms with suitable examples: 2
(i) Amorphous solid (ii) Frenkel defect
- Q11. An element with molar mass $2.7 \times 10^{-2} \text{ kg mol}^{-1}$ forms a cubic unit cell with edge length 405 pm. If its density is $2.7 \times 10^3 \text{ kg m}^{-3}$, what is the nature of the cubic unit cell? 2
- Q12. a) What is the difference between molecularity and order of reaction? 2
b) Define pseudo first order reaction.
- Q13. Complete the following reaction: 2
i) $\text{XeF}_4 + \text{H}_2\text{O} \rightarrow$
ii) $\text{P}_4 + \text{HNO}_3(\text{conc}) \rightarrow$
- Q14. The decomposition of phosphine, PH_3 , proceeds according to the following equation: 2
$$4\text{PH}_3(g) \rightarrow \text{P}_4(g) + 6\text{H}_2(g)$$

It is found that the reaction follows the following rate equation:
Rate = $k[\text{PH}_3]$
The half-life of PH_3 is 37.9 s at 120°C .
(i) How much time is required for 3/4th of PH_3 to decompose?
(ii) What fraction of the original sample of PH_3 remains behind after 5 minute?
- Q15. i) Draw the structure of pyrophosphoric acid. 2
ii) SF_6 does not react with water but SF_4 can easily hydrolyzed. Give reason.

Q16. Write the IUPAC name and describe the magnetic behaviour (diamagnetic or paramagnetic) of the following coordination entities: 2



(At. Nos. : Cr = 24, Co = 27)

Or

Giving a suitable example for each, explain the following:

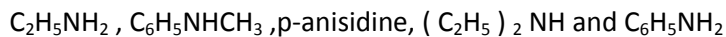
(i) Tetrahedral Crystal field splitting of d subshell.

(ii) Linkage isomerism.

(iii) Ambidentate ligand.

Q17. In the following cases rearrange the compounds as directed: 2

i) In an increasing order of pK_b values:



ii) Distinguish between Aniline and benzyl amine.

Q18. i) Write a short note on Hofmann's bromamide reaction. 2

ii) Write a short note on coupling reaction with one example.

Q19. i) Write mechanism of dehydration of ethanol. 3

ii) Convert methanol to butan-1-ol.

Q20. A cell, $\text{Ag}/\text{Ag}^+(\text{saturated Ag}_2\text{CrO}_4 \text{ solution}) \parallel \text{Ag}^+(0.1\text{molar})/\text{Ag}$, if EMF is 0.164 V, then calculate the following: (Given $E^\circ \text{Ag}^+/\text{Ag} = 0.80 \text{ v}$) 3

i) Concentration of Ag_2CrO_4 solution

ii) Solubility product of Ag_2CrO_4 solution

iii) E° cell

Or

Three electrolytic cells A,B,C containing solutions of $ZnSO_4$, $AgNO_3$ and $CuSO_4$, respectively are connected in series. A steady current of 1.5 amperes was passed through them until 1.45 g of silver deposited at the cathode of cell B. How long did the current flow? What mass of copper and zinc were deposited?

(At.mas Cu=63.5, Ag=108, Zn=65.39)

- Q21. i) What happens when a colloidal sol of $Fe(OH)_3$ is mixed with that of As_2S_3 sol? 3
 ii) What is the difference between gel and emulsion?
 iii) Write the cause of tyndal effect.
- Q22. Describe the role of the following: 3
 (i) NaCN in the extraction of gold.
 (ii) I_2 in the purification of Zirconium.
 (iii) Leaching in the extraction of aluminium.
- Q23. i) Why fluorine does not show +ve oxidation state? 3
 ii) What happens when PCl_5 react with finely powdered tin?
 iii) How can you detect presence of SO_2 ?
- Q24. i) Define enantiomer .Calculate no. of optically active stereo isomers in 2,3 dichloro butane. 3
 ii) Arrange the following in increasing order of reactivity towards SN^1 : $(CH_3)_2CHI$, $CH_2=CHCH_2I$, $C_6H_5CH_2I$
 iii) Prepare 1-Fluoro propane from 2-Chloropropane
- Q25. i) What is tincture of iodine? What is its use? 3
 ii) Write the composition of dettol.
 iii) Write one advantage and one disadvantage of using aspirin.

Q26. Pradeep had very high fever. He was given strong antibiotics. But after recovering from fever he was not able to digest food and was feeling too weak. The grandmother who lived in his neighborhood suggested him to take lots of milk, egg, fruits and vegetables. 3

a. Why?

b. What is the remedy for this?

c. What was the value that Pradeep had by taking fruits and vegetables?

Q27. i) Distinguish between the terms homopolymer and copolymer and give an example of each. 3

ii) Write the monomer of nylon 2,6

iii) Write the monomer of Dacron.

Q28. a) Define Ebullioscopic constant, write its unit. 5

b) Define Henry law. Write one application.

c) A solution prepared by dissolving 1.25 g of oil of winter green (methyl salicylate) in 99.0 g of benzene has a boiling point of 80.31°C. Determine the molar mass of this compound.

(B.P. of pure Benzene = 80.10°C and K_b for benzene = 2.53°C kg mol⁻¹)

Or

a) What is meant by negative deviation from Raoult's law? Draw diagram to illustrate the relationship between vapour pressure and mole fraction of carbon disulphide and acetone in a solution to represent negative or positive deviation?

b) 6 mL of acetic acid (CH₃COOH), having density 1.06 g mL⁻¹, is dissolved in 1 litre of water. The depression in freezing point observed for this strength of acid was 0.0205°C. Calculate the van't

Hoff factor and the dissociation constant of acid. ($K_f = 1.86 \text{ K kg mol}^{-1}$)

Q29. i) Write short note on Hell Volhard - Zelinsky reaction. 5

ii) Distinguish between methyl benzoate and ethyl benzoate.

iii) An organic compound (A) with molecular formula C₁₀H₁₂O forms an orange-red precipitate with 2,4-DNP reagent and gives yellow precipitate on heating with iodine in the presence of sodium hydroxide. It neither reduces

Tollens' or Fehlings' reagent, nor does it decolourise bromine water or Baeyer's reagent. On drastic oxidation with chromic acid, it gives a benzene 1,3,5 tricarboxylic acid (B) having molecular formula $C_9H_6O_6$. (B) on decarboxylation gives aromatic compound (C). Identify the compounds (A), (B) and (C) and explain the reactions involved.

Or

i) Arrange the following compounds in increasing order of their reactivity in nucleophilic addition reactions: Acetaldehyde, Acetone, Benzaldehyde, *p*-Tolualdehyde, *p*-Nitrobenzaldehyde, Acetophenone.

ii) Convert Benzaldehyde to α -Hydroxyphenylacetic acid. (in two step)

iii) Describe Cannizzaro reaction with example.

iv) Although phenoxide ion has more number of resonating structures than carboxylate ion, carboxylic acid is a stronger acid than phenol. Why?

v) Ethanal to 3-hydroxy butanoic acid. (in two step)

Q30. i) The actinoids exhibit more number of oxidation states in general than the lanthanoids.

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ii) Write the cause and consequences of lanthanoid contraction.

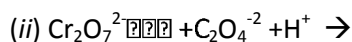
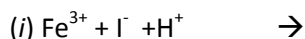
iii) With same (d^4) configuration Cr (II) is reducing whereas Mn (III) is oxidising.

iv) How to prepare $K_2Cr_2O_7$ from chromite ore.

v) Why trend of melting point is minimum and oxidation number is maximum in middle of transition series.

Or

(a) Complete the following chemical equations:



iii) Why Eu (III) is more stable than Ce (III)?

iv) On the basis of data given below comment on the stability of Fe^{3+} in acid solution as compared to that of Cr^{3+} or Mn^{3+} . [$Cr^{2+}/Cr = -0.9V$, $Cr^{3+}/Cr^{2+} = -0.4V$, $Mn^{2+}/Mn = -1.2V$, $Mn^{3+}/Mn^{2+} = +1.5V$]

$\text{Fe}^{2+}/\text{Fe} = -0.4\text{V}$, $\text{Fe}^{3+}/\text{Fe}^{2+} = +0.8\text{V}$]

v) Write the disproportionation reaction of Manganate ion in acidic or neutral medium.

Paper Submitted By:

Name: Om jee singh

Email: omjeesingh@gmail.com

Phone No. 9401368600