2MD

Second Mid Term Test - 2022

12 - Std

Chemistry

Time : 1.30 hrs. Marks : 35

I Choose the best answer. 10 X 1 = 10

1. Oxidation state of Iron and the charge on the ligand NO in $[Fe(H_2O)_5NO]SO_4$ are
   a) +2 and 0 respectively
   b) + 3 and 0 respectively
   c) + 3 and - 1 respectively
   d) +1 and +1 respectively

2. Fac-mer isomerism is shown by
   a) $[CO(en)_3]^{3+}$
   b) $[CO(NH_3)_3Cl_3]$
   c) $[CO(NH_3)_4Cl_2]^+$
   d) $[CO(NH_3)_5Cl]SO_4$

3. Which of the following electrolytic solution has the least specific conductance
   a) 2N b) 0.002N c) 0.02N d) 0.2N

4. Assertion : Pure iron when heated in dry air is converted with the layer of rust.
   Reason : Rust has the composition Fe_3O_4.
   a) both assertion and reason are true and reason is the correct explanation of assertion.
   b) both assertion and reason are true but reason is not the correct explanation of assertion.
   c) assertion is true but reason is false.
   d) both assertion and reason are false.

5. Statement : To stop bleeding from an injury, ferric chloride can be applied. Which comment about the statement is justified?
   a) It is not true, ferric chloride is a poison.
   b) It is true, Fe^{3+} ions coagulate blood which is a negatively charged sol.
   c) It is not true, ferric chloride is ionic and gets into the blood stream.
   d) It is true. Coagulation takes place because of formation of negatively charged sol with Cl.

6. Which are the following is correctly matched?
   a) Emulsion - Smoke
   b) Solid sol - Pearls
   c) Foam - Mist
   d) Whipped cream - Sol

7. Nano bi metallic catalyst have
   a) Zero valent State
   b) Monovalent State
   c) Bivalent State
   d) Trivalent State

8. When aniline reacts with acetic anhydride the product formed is
   a) o - aminoacetophenone
   b) m - amino acetophenone
   c) p - aminoacetophenone
   d) acetanilide

9. Which one of the following is most basic?
   a) 2,4 di chloro aniline
   b) 2,4 - dimethyl aniline
   c) 2,4 - di nitro aniline
   d) 2,4 - di bromo aniline

10. $CH_3 - NC + 4\,[H] \xrightarrow[Ni/H_2]{Na/C_2H_5OH} ?$
   a) Amide
   b) Primary amine
   c) Secondary amine
   d) Tertiary amine

II Answer any three of the following and Q.No. 15 is compulsory. 3 X 2 = 6

11. Classify the following ligand based on the number of donor atoms.
   a) NH_3 b) en c) OX^{2-} d) pyridine.

12. State Kohlrausch law.

13. What do you mean by the term Promoter? Give an example.

14. List any two differences between physisorption and chemisorption.

15. Write any two electrophilic substitution reactions of nitro benzene.

III Answer any three of the following questions. 3 X 3 = 9
(Q.No. 20 is compulsory)

16. Write the postulates of Werner's theory. (3 points)

17. What are hydrate Isomers? Explain with an example.

18. List down the various steps involved in a heterogeneous catalysed reaction based on Langmair adsorption theory.

19. Write short notes on i) Hofmann's bromamaide reaction ii) Carbylamine reaction.

20. Calculate the standard emf of the $Cd|Cd^{2+}||Cu^{2+}|Cu$ and determine the cell reaction. The standard reduction potentials of $Cu^{2+}|Cu$ and $Cd^{2+}|Cd$ are 0.34V and -0.40volts reproductively. Predict the feasibility of the cell reaction.

IV Answer all the following. 5 X 2 = 10

21. a) Derive an expression for Nernst equation. ***(OR)***
   b) Based on VB theory explain why $[NiCN_4]^{2-}$ is diamagnetic, while $[Ni(Cl)_4]^{2-}$ is paramagnetic .

22. a) Explain : i) Electrophoresis. (3) ii) Ultrafiltration. (2) ***(OR)***
   b) (i) How will you distinguish primary, secondary and tertiary aliphatic amines. (3)
   (ii) Why Aniline does not undergo Friedal - Crafts reaction. (2)