LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

U.G. DEGREE EXAMINATION – **ALLIED**

SECOND SEMESTER – **APRIL 2023**

CH 2104 – GENERAL CHEMISTRY FOR MATHS & PHYSICS

Date: 10-05-2023 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

Part-A

Answer ALL questions. **(10 x 2 = 20 Marks)**

1. What are double salts? Cite an example.
2. Write the oxidation number of the metal, IUPAC name and coordination number of the complex, $[Cr(NH_3)_6]Cl_3$.
3. Draw *cis* and *trans* isomers of 2-butene.
4. Setch the conformational isomers of ethane.
5. Find the pH of 0.001 M aqueous solution of hydrochloric acid.
6. Differentiate homogeneous and heterogeneous catalysis with examples.
7. State Einstein's law of photochemical equivalence.
8. Define quantum yield of a photochemical reaction.
9. Mention the disadvantages of hard water.
10. List BIS specifications of drinking water.

Part-B

Answer any EIGHT questions. **(8 x 5 = 40 Marks)**

11. What are ligands? Mention any one kind of classification of ligands with examples.
12. Write the postulates of Werner's theory of coordination complexes.
13. Calculate the EAN and predict whether the following complexes are stable or not.
    (a) $[Fe(CN)_6]^{4-}$ (b) $[Ni(CO)_4]$
14. Discuss the structure and functions of haemoglobin.
15. Explain the mechanism for nitration of benzene.
16. What is inductive effect? Explain its types with suitable examples.
17. Discuss the optical isomerism exhibited by lactic acid.
18. Derive Nernst equation for calculating EMF of a cell.
19. Distinguish between order and molecularity of a reaction.
20. Explain photosensitization with an example.
21. How do hardness of water can be determined using EDTA method?
22. Discuss the reverse osmosis method of purifying water.

Part-C

Answer any FOUR questions. **(4 x 10 = 40 Marks)**

23. Explain the hybridization, shape and magnetic nature of $[CoF_6]^{3-}$ using valence bond theory.

24a. Describe the classification of organic reactions with examples.

b. What is corrosion? How can it be prevented? (5+5)

25. Differentiate S_N1 and S_N2 reaction mechanisms with suitable examples.
26. Obtain the expression for the rate constant of a second order reaction, $2A \rightarrow P$.

27a. State and derive Beer-Lambert's law.

b. Compare thermal and photochemical reactions. (6+4)

28. What is air pollution? What are its causes and how is it prevented?

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