LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **MATHEMATICS**

SECONDSEMESTER – APRIL 2018

CH 2104- GENERAL CHEMISTRY FOR MATHS & PHYSICS

Date: 28-04-2018 Dept. No. Max. : 100 Marks
Time: 01:00-04:00

Part-A

Answer ALL questions. **(10 × 2= 20)**

1. Differentiate between double salts and coordination compounds.
2. Give the IUPAC name of the following coordination compounds.
   a) $K_3[Fe(CN)_6]$ b) $[Co(NH_3)_6]Cl_3$
3. Write the conditions for the compound to show optical activity.
4. Give the conformational isomers of ethylene.
5. Calculate the pH of 0.001M HCl.
6. What are strong and weak electrolytes? Cite an example.
7. State Beer-Lambert's law.
8. Write the Arrhenius equation and mention the terms involved in it.
9. What are the differences between temporary hardness and permanent hardness of water?.
10. Write the significances of COD values.

Part-B

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

11. Write the postulates of Werner's theory of coordination compounds.
12. Calculate the EAN of the metal ion in the following complexes
    i) $[Ni(NH_3)_6]^{2+}$ (At.No. Ni=28) ii) $Fe(CO)_5$ (At.No. Fe=26)
13. What is inductive effect? Discuss any one application of it.
14. Write the mechanism of E_2 reaction.
15. Explain the optical isomerism in tartaric acid.
16. Describe the construction and working of calomel electrode.
17. Derive Nernst equation.
18. Write the differences between order and molecularity of a chemical reaction.
19. State the Grotthus-Draper law and Einstein's law of photochemistry
20. Define 'quantum yield'. Mention any two reasons for high and low quantum yield.
21. How is water purified by reverse osmosis method?
22. Write a short note on air pollution.

Part-C

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

23a. Predict the hybridization and geometry to account for the magnetic property of $[FeF_6]^{3-}$ using VB theory. (5)

b. Write the biological importance of chlorophyll and haemoglobin. (5)

24. Explain the S_N1 and S_N2 mechanism of alkyl halides.

25a. Discuss the conformational isomers of ethane. (5)

b. Define the following terms a) Ionic product of water b)Buffer solution (5)

26. Derive an expression for the rate constant of a second order reaction of the type $2A \rightarrow$ Product

27a. Compare thermal and photochemical reaction. (5)

b. What is photosensitization? Explain with suitable examples. (5)

28a. How is hardness of water estimated by EDTA method? (5)

b. Write a short note on green house effect. (5)