LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **PHYSICS**

THIRD SEMESTER – **NOVEMBER 2018**

16/17UCH3AL01– GENERAL CHEMISTRY FOR PHYSICS-I

Date: 03-11-2018 Dept. No. Max. : 100 Marks

Time: 01:00-04:00

Part-A

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

1. Write the IUPAC name of $K_3[Fe(CN)_6]$.
2. Account for the formation of coordination compounds with tetrahedral geometry.
3. What is Inductive effect?
4. Why is acetic acid more acidic than ethanol?
5. Calculate the pH of 0.01M HCl.
6. Write the cell reaction for the following electrochemical cell: $Cd/Cd^{2+}// Ag^{+}/Ag$.
7. State the rate law.
8. Define 'chemiluminescence'. Give an example.
9. What is temporary hardness?
10. Give an example for addition polymerization.

Part-B

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

11. Write the postulates of Werner's Theory.
12. Discuss the structure and functions of chlorophyll.
13. Calculate the crystal field stabilization energy (CFSE) in Dq for the following octahedral complexes a) $[Mn(CN)_6]^{3-}$ b) $[Mn(H_2O)_6]^{3+}$.
14. Predict the reactivity of maleic and fumaric acids at 140°C.
15. Discuss the mechanism of E2 reaction.
16. Explain the Arrhenius and Lewis concept of acids and bases.

17. Derive Nernst equation for an electrochemical reaction.

18. Write Arrhenius equation and mention the terms involved in it. Mention its significance.

19. Describe the mechanism of photosynthesis.

20. Compare thermal and photochemical reactions.

21. How is water purified using ion-exchange method?

22. Write a short note on vulcanization of rubber.

Part-C

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

23. a) Write the postulates of crystal field theory. **(5)**

b) Explain the crystal field splitting pattern of octahedral complexes. **(5)**

24. a) How does the :NH_2 group exhibit resonance effect in aniline? **(5)**

b) Write the mechanism of electrophilic and nucleophilic addition reactions. **(5)**

25. a) Define the following terms: i) ionic product of water ii) pk_a and pk_b **(5)**

b) Write the differences between galvanic and electrolytic cells. **(5)**

26. Derive an expression for the rate constant of a second order reaction of the type

2A →product. **(10)**

27. a)What is a reference electrode? Explain the construction of saturated calomel electrode. **(5+2)**

b) State the Beer-Lambert law. **(3)**

28. a)Describe the chlorination process to improve the quality of water. **(5)**

b)What are thermo and thermosetting plastics? Explain with suitable examples. **(5)**

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