



Date: 26-04-2016

Dept. No.

Max. : 100 Marks

Time: 01:00-04:00

Part-A

Answer ALL questions.

(10 x 2= 20)

1. Give the IUPAC name of the following coordination compounds.
 - a) $[\text{Cr}(\text{H}_2\text{O})_6]\text{Cl}_3$
 - b) $\text{K}_4[\text{Fe}(\text{CN})_6]$
2. Dipole moment of cis-1,2-dichloroethane is 1.85 Debye while dipole moment of trans-1-2-dichloroethane is zero. Explain.
3. Calculate the Effective atomic number of the following compounds
 - a) $[\text{Fe}(\text{CO})_5]$ At.No (Fe=26)
 - b) $[\text{Fe}(\text{CN})_6]^{3-}$
4. State the differences between enantiomers and diastereomers.
5. Write the relationship between solubility and solubility product.
6. What is a heterogeneous catalyst? Cite an example.
7. What are strong and weak electrolytes? Cite an example for each.
8. Define 'quantum yield'.
9. Mention any two disadvantages of hard water
10. Write any two significances of BOD.

Part-B

Answer any EIGHT questions.

(8 x 5= 40)

11. Explain the optical isomerism in lactic acid.
12. Discuss the applications of coordination chemistry in biological compounds.
13. Define inductive effect and discuss any one application of it.
14. Write the mechanism of E_1 reaction and give its characteristics.
15. Why formic acid is stronger than acetic acid? Explain
16. Define the following terms i) ionic product of water b) buffer solution
17. Discuss the construction of saturated calomel electrode.
18. Derive the expression for the first order rate constant
19. State the Grotthus-Draper and Stark-Einstein laws of photochemistry
20. What is photosensitization? Explain it with examples.
21. What is meant by reverse osmosis? How is water purified by this method?
22. Briefly discuss the effect of air pollution.

Part-C

Answer any FOUR questions.

(4 x 10= 40)

23. Compare S_N1 and S_N2 reaction mechanisms with examples. (10)
- 24a. Write the postulates of Werner's theory of coordination compounds. (6)
- b. For the complex $[\text{FeF}_6]^{3-}$, based on VB theory, explain its hybridisation, structure and magnetic property. At. No. (Fe=26) (4)
- 25a. Identify the products in the following reactions and state the type of reaction in each case
- i) $\text{CH}_2=\text{CH}_2 + \text{HBr} \rightarrow \text{A}$
- ii) $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{Br} + \text{KOH (aqueous)} \rightarrow \text{B}$
- iii) $\text{CH}_3-\text{CH}_2-\text{Cl} + \text{NaOH (alcoholic)} \rightarrow \text{C}$ (5)
- b. Discuss the Arrhenius equation and its significances. (5)
- 26a. Derive Nernst equation. Mention its significances. (8)
- b. What is a buffer solution? Give an example. (2)
- 27a. Define order of a reaction. How is it determined by graphical method? (5)
- b. Enumerate the differences between thermal and photochemical reactions. (5)
- 28a. How is hardness of water estimated by EDTA method? (5)
- b. Write a short note on greenhouse effect. (5)
