

Third Year B.Sc. Degree Examination
August/September 2010

Directorate of Distance Education Course
(Freshers)

CHEMISTRY

Paper-IV: Chemistry

Time: 3 hrs]

[Max.Marks: 85

- Note:** 1) This paper consists of Four sections. Answer all sections.
2) Write equations and neat diagrams wherever necessary.

SECTION - A

I. Answer in a word, phrase or a sentence : 10 X 1 = 10 Marks

1. Define Beers' law.
2. Write clausius – Mossatti equation.
3. What are transition elements?
4. Define BOD.
5. What is dosimetry?
6. What is the total number of element of symmetry present in cubic system?
7. What is meant by chemotherapy?
8. Write the IUPAC name of the metal complex $K_3(Fe(CN)_6)$
9. What is meant by racemisation?
10. What are miller indices?

SECTION - B

II. Answer any FIVE of the following : 5 X 3 = 15 Marks

11. Explain Walden inversion with an example.
12. Mention the synthesis of indigo.
13. Explain the principle of chemical actiono meter.
14. How is Telfon manufactured? Mention its uses.
15. Explain factors affecting stability of complex ions.
16. State and explain the laws of photochemistry.
17. Derive Bragg's equation.

SECTION - C

- III. Answer any FIVE of the following : 5 X 6 = 30 Marks
18. a) Explain the photosynthesis of HCl from H_2 and Cl_2 4 Marks
 b) What is photosensitization? Give an example. 2 Marks
19. a) Mention the detailed account of photochemical smog. 4 Marks
 b) Explain the depletion of Ozone layer. 2 Marks
20. a) Discuss asymmetric synthesis with an example. 4 Marks
 b) How is pyridine synthesized? 2 Marks
21. a) Explain acid rain with chemical reactions. 4 Marks
 b) Write the structure of the following: i) Oxine ii) EDTA 2 Marks
22. a) Define dipole moment, what is its units? How does dipole moment help in differentiating the geometries of Cis and trans isomers of 1,2-dichloro ethane. 4 Marks
 b) Define the following terms:
 i) Plane of Symmetry
 ii) axes of symmetry 2 Marks
23. a) Discuss the free radical mechanism of addition polymerization. 4 Marks
 b) How is ethyl aceto acetate prepared from ethyl acetate? 2 Marks
24. a) Explain the terms: i) Linkage isomers ii) Hydrate isomerism 2 Marks
 b) What are microwave active and inactive molecules? Give an example. 2 Marks

SECTION - D

- IV. Answer any THREE of the following : 3 X 10 = 30 Marks
25. a) Discuss the construction of spectro-photometer and determination of absorption bond. 5 Marks
 b) Derive an expression for moment of inertia of heteronuclear diatomic molecule as rigid rotator. 3 Marks
 c) What are electromagnetic radiations? Give an example. 2 Marks
26. a) On the basis of VBT, explain the formation of $[Fe(CN)_6]^{4-}$ 5 Marks
 b) Name and draw the structure of the different geometrical isomers possible for the complex $[Pt(NH_3)_4Cl_2]^{2+}$ 3 Marks
 c) What are postulates of VBT? 2 Marks

27. a) Discuss the structural elucidation of Alizarin. 5 Marks
b) What are chromophores and auxochromes? Give an example. 3 Marks
c) Explain the synthesis of antipyrine. 2 Marks
28. a) Discuss the mechanism of radiolysis of water. 5 Marks
b) The microwave spectrum of HCl molecule consists of series of equidistance lines with spacing 12.8 cm^{-1} . Calculate the bond length of the molecule. 3 Marks
c) Sketch the vibrational energy levels of diatomic molecule considering as a simple harmonic oscillator. 2 Marks
