

**Q.P. Code – 50827**

**Third Year B.Sc. Degree Examination**

**OCTOBER/NOVEMBER 2014**

**(Directorate of Distance Education)**

**(DSC 261) Paper IV – CHEMISTRY**

*Time : 3 Hours]*

*[Max. Marks : 75/85*

**Instructions to Candidates :**

- 1) *This paper consists of five Sections. Answer all Sections.*
- 2) *Write equations and neat diagrams wherever necessary.*
- 3) *Section-**E** is **compulsory** for **85** marks scheme only.*

SECTION – A

Answer the following questions in a word, a phrase or a sentence : **10 × 1 = 10**

1. Define COD.
2. Give an example for bidentate ligand.
3. Define phosphorescence.
4. What are drugs?
5. Write the IUPAC name of the compound  $[\text{PtCl}_2(\text{NH}_3)_2]$ .
6. Define photon.
7. Write Clausius-Mosotti equation.
8. Define chirality.
9. Write the structural formula of methyl orange.
10. Define racemisation.

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### SECTION – B

Answer any **FIVE** questions :

**5 × 3 = 15**

11. How will you explain the fact that transition elements form coloured compounds?
12. Explain photosensitized reactions with example.
13. Write a note on Walden inversion.
14. Explain the lanthanide contraction.
15. Explain the following terms :
  - (a) Centre of symmetry
  - (b) Crystal lattice.
16. Write a note on photochemical smog.
17. Describe the synthesis of indigo.

### SECTION – C

Answer any **FIVE** questions :

**5 × 6 = 30**

18. (a) Discuss the separation of lanthanide by ion exchange chromatographic method. **4**  
(b) What are fluoro carbons? Give their two important uses. **2**
19. (a) State and explain Lambert's - Beer's law. **4**  
(b) How is dipole moment useful for the determination of the shape of CO<sub>2</sub> molecule? **2**
20. (a) Discuss optical isomerism of tartaric acid. **4**  
(b) Give the synthesis of malachite green. **2**
21. (a) Discuss the stereo-isomerism in complex compounds with coordination number four. **4**  
(b) Define polydentate ligand with example **2**

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22. (a) Define the following terms :
- (i) Orientation polarisation 4
  - (ii) Molar polarisation. 4
- (b) State and explain Grothus-Drapper's law. 2
23. (a) Discuss R and S notations in optically active compounds. 4
- (b) What is Claisen-condensation reaction? Give example. 2
24. (a) Give the synthesis of antipyrine. 2
- (b) What is thermosetting polymer? Give example. 2
- (c) What is asymmetric synthesis? 2

### SECTION – D

Answer any **TWO** of the following : **2 × 10 = 20**

25. (a) Discuss Werner's theory of coordination compounds. 4
- (b) Discuss electronic configuration and complex formation of *f*-block elements. 4
- (c) What is biochemical oxygen demand? 1
- (d) Write the structure formula of EDTA. 1
26. (a) Discuss the photochemical decomposition reaction of HCl. 4
- (b) Derive an expression for moment of inertia of diatomic molecule as a rigid rotator. 4
- (c) Define Hook's law. 2
27. (a) Discuss the comparison of bond polarity taking hydro acids of halogens. 3
- (b) Derive Bragg's law equation. 4
- (c) State Einstein's law of photochemical equivalence. 2
- (d) Define Refractive Index. 1

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### SECTION – E

**Compulsory** Question for **85** marks scheme only :

Answer any **ONE** of the following :

**1 × 10 = 10**

28. (a) How do you synthesise the following compounds from ethyl acetate?
- (i) Adipic acid
  - (ii) Cinnamic acid. **4**
- (b) What are dia stereomers? **2**
- (c) Discuss the chromophore theory of organic compounds. **3**
- (d) Give the synthesis of pyridine from acetylene. **1**
29. (a) Discuss the formation of  $[\text{Cu}(\text{NH}_3)_4]^{2-}$  on the basis of valence bond theory. **4**
- (b) Explain the free-radical mechanism of polymerisation. **3**
- (c) Define resolution of Racemic mixture. Explain biochemical method of resolution. **3**
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