Q.P. Code – 50827

Third Year B.Sc. Degree Examination, OCTOBER/NOVEMBER 2016

(Directorate of Distance Education)

Chemistry

(DSC 261) Paper IV – CHEMISTRY – IV

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

I. Answer in a word, a phrase or a sentence : **10 × 1 = 10**

1. What is optical activity?
2. What are transition elements?
3. State Stark-Einstein law of photochemical equivalence.
4. What is chemotherapy?
5. Define : Degree of Polymerisation.
6. What is effective atomic number rule?
7. Define Biological Oxygen Demand (BOD).
8. What is asymmetric synthesis?
9. What are ambidentate ligands? Give one example.
10. Name the menomess present in Nylon 6, 6.

SECTION – B

II. Answer any FIVE of the following Questions : **5 × 3 = 15**

11. What are azo-dyes? How are they classified?
12. What is Smog? How does it cause pollution?

13. Give the synthesis of Methyl Orange.

14. Define the terms :
    (a) Ligands
    (b) Co-ordination number
    (c) Co-ordination sphere

15. (a) Define : Dipole moment. **1**

    (b) The bond-length of H-I bond is 1.6 A° and its dipole moment is 0.38 D. Calculate the percentage ionic character of H–I bond. Given $q = 4.8 \times 10^{-10}$ esu. **2**

16. Give the synthesis and uses of Aspirin.

17. Discuss the magnetic properties of Lanthanides.

SECTION – C

III. Answer any FIVE of the following Questions : 5 × 6 = 30

18. (a) State and explain Grotthus Law. **3**

    (b) What are photo-inhibitors? How do they act? **3**

19. (a) What is chiral carbon atom? Discuss the optical activity of Lactic acid. **4**

    (b) Define the terms : (i) Antipyretics (ii) Analgesics. Give example for each. **2**

20. (a) What is Stereoisomerism? What are different kinds of stereoisomerism? **2**

    (b) Explain the different types of molecular spectra. **4**

21. (a) Describe the general characteristics of d–block elements. **4**

    (b) Explain why pyridine is more basic than pyrrole. **2**

22. (a) Give the synthesis of Indigo from Aniline. **3**

    (b) Transition metal compounds are generally coloured. Explain. **3**

23. (a) With a diagram, explain molecular energy levels. **4**

    (b) Explain the acidic character of pyrrole. **2**

24. (a) Explain the separation of Lanthanides by ion exchange chromatography. **4**

    (b) Define the terms : (i) Auxochrome (ii) Chromophore. **2**

SECTION – D

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

25. (a) Discuss the structural elucidation of Alizarin. **4**

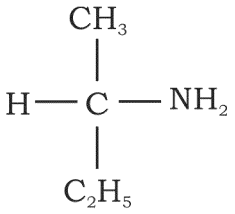
(b) Describe the synthesis, physiological action and uses of sulphanilamide. **4**

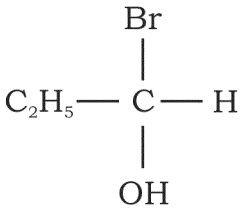
(c) Explain the anomalous electronic configuration of Cr and Cu. **2**

26. (a) Give the classification of dyes based on chemical constitution with examples. **4**

(b) Give the Claisen condensation mechanism of synthesis of Ethyl aceto acetate. **4**

(c) Assign the R and S configuration of the following : **2**

(i) 

(ii) 

27. (a) Discuss the catalytic properties of transition elements. **4**

(b) Describe the preparation of Alizarin from Anthraquinone. **3**

(c) Write a note on Photosensitization. **3**

SECTION – E

V. Answer any ONE of the following questions : **1 × 10 = 10**

(**Compulsory** Question for **85** marks scheme only)

28. (a) Describe the postulates of Werner's theory of co-ordination compounds. **4**

(b) Discuss the photochemical decomposition of HBr. **4**

(c) What are high spin and low spin complexes? **2**

29. (a) Discuss lanthanide contraction giving causes and its consequences. **4**

(b) The bond length of HCl molecule is 1.28×10^{-10} m. Calculate the moment of inertia and frequency of first line in rotational spectra. **4**

(c) Write a note on green-house effect. **2**
