



DCCH101

Reg. No.

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I Semester B.Sc. Degree Examination, April - 2023

CHEMISTRY

Analytical, Inorganic and Organic Chemistry

Paper : DSC-I

(NEP CBCS Scheme 2021-22 Onwards)



Time : 2½ Hours

Maximum Marks : 60

*Instructions to Candidates:*

1. The question paper has **Three** parts. Answer **all** the parts.
2. Draw **diagrams** and write chemical equations wherever necessary..

**PART - A**Answer **any FIVE** of the following questions. Each question carries 2 marks.(5×2=10)

1. Mention any two Random errors.
2. Define screening effect.
3. What are nodal planes? How many nodal planes are there for 3s orbital?
4.  $K^+$  is smaller than  $Cl^-$ . Give reason.
5. Explain Diels - Alder reaction.
6. Why is chloroacetic acid is stronger than acetic acid.

**PART - B**Answer **any FOUR** of the following questions. Each question carries 5 marks.(4×5=20)

7. a. Calculate the mole fraction of benzene in solution containing 20% by mass of it in carbon tetra-chloride.  
b. Write the electronic configuration of elements with atomic numbers 16 and 27.(3+2)
8. a. Define sampling. Discuss sampling methods for liquids.  
b. Define Normality. (3+2)
9. a. Discuss the trends in the properties of oxides of Group - 15 elements.  
b. Define the terms :
  - i. Technique.
  - ii. Method. (3+2)

[P.T.O.]



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10. a. What is radial probability distribution curve? Draw the radial probability distribution curve for 1s orbital.  
b. What are Eigen values? (3+2)
11. a. Explain Hoffmanns elimination reaction with an example.  
b. What is epoxidation reaction? Give an example. (3+2)
12. Discuss the stability of alkyl carbocations with respect to  
i. Inductive effect and  
ii. Hyper conjugation effect. (5)

### PART - C

Answer any **THREE** of the following questions. Each question carries **10** marks. (3×10=30)

13. a. Explain the criteria to be followed for the selection of Analytical methods and mention its limitations.  
b. What is :  
i. Standard deviation.  
ii. Range. (6+4)
14. a. What are quantum numbers? Give their significance.  
b. Write the Aufbau principle.  
c. Write the postulates of quantum mechanics. (4+2+4)
15. a. Derive Time independent schrodinger wave equation.  
b. Explain the Slaters rule for calculating screening constant and effective nuclear charge. (6+4)
16. a. What happens when HBr is added to ethyne?  
b. What is Ozonolysis?  
c. Explain Hoffman elimination reaction with an example.  
d. What are electrophiles? Give an example. (2+2+3+3)
17. a. Write the mechanism of chlorination of methane.  
b. Define Ionisation enthalpy. How does it vary across a period and down a group?  
c. Mention the limitations of classical mechanics. (4+4+2)