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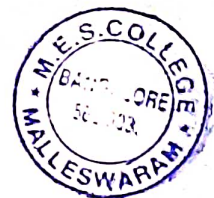
II Semester B.Sc. Degree Examination, September - 2023

CHEMISTRY

Analytical, Organic and Physical Chemistry

Paper : II

(NEP CBCS Scheme 2021-22 Onwards)



Time : 2½ Hours

Maximum Marks : 60

*Instructions to Candidates:*

1. The question paper has three parts Answer all parts.
2. Write chemical equations and diagrams wherever necessary.

**PART - A**

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

1. What is meant by regression co-efficient?
2. Explain friedel - craft's acylation with an example.
3. What is root mean square velocity of gas molecules?
4. Define viscosity of a liquid.
5. Name any two factors which affect distribution co-efficient.
6. Define inversion temperature.

**PART - B**

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

7. a. Explain the principle of complexometric titration with an example.  
b. Give any two examples of indicators used in complexometric titrations. (3+2)
8. a. Explain the volhard's method of determination of halide concentration.  
b. Define post precipitation. (4+1)
9. a. With energy profile diagram explain the mechanism of SN<sup>2</sup> reaction.  
b. Mention the role of nitro group in nitro benzene towards electrophilic substitution reactions. (4+1)

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10. a. Describe Andrews isotherms of  $\text{CO}_2$ .  
b. What is Joule - Thomson effect? (3+2)
11. a. Describe the Beckmann method of determination of molar mass of a solute.  
b. Calculate the boiling point of an aqueous solution containing 18 g of glucose (molar mass =  $180 \text{ g mol}^{-1}$ ) in 100 g of water. The molal elevation constant of water is  $0.52 \text{ K kg mol}^{-1}$  and the boiling point of water is 373 K. (3+2)
12. a. Explain the desilverisation of lead of parke's process.  
b. Define molal depression constant or cryoscopic constant. (3+2)

### PART - C

Answer any **THREE** of the following questions. Each question carries **ten** marks.

(3×10=30)

13. a. Explain the factors which influence precipitation in gravimetric analysis.  
b. What are the advantages of organic reagents over inorganic reagents in gravimetric analysis?  
c. What is meant by figures of merit? Mention any two types for figures of merit. (4+4+2)
14. a. Explain the mechanism of sulphonation of benzene.  
b. What is ipso substitution? Explain  $S_N^Ar$  mechanism with suitable example.  
c. What is benzyne? Write its structure. (4+4+2)
15. a. Explain the process of liquefaction of air by linde's process.  
b. Define parachor. Explain the elucidation of structure of benzene based on parachor.  
c. Explain the stability of benzyne based on Huckle's rule of aromaticity. (4+4+2)
16. a. Describe the determination of surface tension of a liquid by stalagmometer.  
b. Explain the landsberger's method of determination of molar mass of a solute.  
c. Mention the electrophiles involved in nitration and halogenation of benzene. (4+4+2)
17. a. Derive Bragg's equation  $n\lambda = 2d \sin \theta$ .  
b. Explain the properties of  
i. Nematic type.  
ii. Cholesteric type liquid crystals with an example.  
c. Mention any two applications of liquid crystals. (4+4+2)