



K22U 2290

Reg. No. : .....

Name : .....

V Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/  
Improvement) Examination, November 2022  
(2019 Admission Onwards)  
CORE COURSE IN CHEMISTRY/POLYMER CHEMISTRY  
5B09 CHE/PCH : Physical Chemistry – I

Time : 3 Hours

Max. Marks : 40

## SECTION – A

(Answer all questions. Each question carries 1 mark.)

1. What is meant by collision frequency ?
2. State Trouton's rule.
3. What is meant by defect in a crystal ?
4. State the law of rational indices. (4×1=4)

## SECTION – B

(Answer any 7 questions. Each question carries 2 marks.)

5. What is meant by compressibility factor ?
6. Calculate the Boyle temperature for oxygen assuming that it is a Vander Waals gas. Given :  $a = 1.36 \text{ dm}^6 \text{ atm mol}^{-2}$ ,  $b = 0.0318 \text{ dm}^3 \text{ mol}$ .
7. Discuss the effect of temperature on surface tension.
8. Define specific refraction and molar refraction.
9. Iron crystallises in a b.c.c. system with  $a = 2.861 \text{ \AA}$ . Molar mass M of iron is 55.85 g/mol. Calculate the density ( $\text{kgm}^{-3}$ ) of iron.
10. Write the Bragg's equation and explain the terms.

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11. Explain Schottky defect.
12. What is meant by relative lowering of vapour pressure ?
13. Write two characteristics of an ideal solution.
14. What is meant by reverse osmosis ? (7×2=14)

## SECTION – C

(Answer any 4 questions. Each question carries 3 marks.)

15. State the principle of equipartition of energy and discuss its contribution to heat capacity of an ideal gas.
16. What is meant by optical activity ? Discuss its determination using Polarimeter.
17. Briefly explain the non-stoichiometric defects in crystals.
18. Discuss the terms : a) Space lattice b) Unit cell c) Miller indices.
19. State the laws of osmotic pressure.
20. State and explain Henry's law. (4×3=12)

## SECTION – D

(Answer any 2 questions. Each question carries 5 marks.)

21. a) Discuss kinetic theory of gases.  
b) Explain most probable velocity and root mean square velocity.
22. a) Define surface tension and coefficient of viscosity.  
b) Discuss the capillary rise method of determining surface tension of a liquid.
23. What are liquid crystals ? Discuss classification and applications of it.
24. What is meant by depression of freezing point ? Arrive at a relationship between the depression of freezing point for a dilute solution of solute and the molar mass of the solute. (2×5=10)