

TB145160C

Reg. No.....

Name.....

**B. Sc. DEGREE (C.B.C.S.S.) EXAMINATION, NOVEMBER 2018**  
**(2014 Admission Supplementary)**  
**SEMESTER V - CORE COURSE (CHEMISTRY)**  
**CHE5SM – STATES OF MATTER**

**Time: Three Hours**

**Maximum Marks: 60**

**PART A**

**I. Answer all questions. Each question carries 1 mark.**

1. For an ideal gas, the compressibility factor (Z) is equal to .....
2. Define Boyle's temperature.
3. Explain the effect of temperature on the viscosity of a gas.
4. Viscosity of a liquid ----- with increase in temperature.
5. Cesium chloride exhibits -----defect
6.  $\text{BF}_3$  molecule belongs to the point group.
7. A group in which all elements commute with each other is called-----
8. Adsorption is generally a ----- phenomenon.

**(8 × 1 = 8)**

**PART B**

**II. Answer any six questions. Each question carries 2 marks.**

9. Define mean free path. How does it vary with temperature?
10. At what temperature will the RMS velocity of chlorine gas be equal to that of  $\text{SO}_2$  gas at STP?
11. Define surface energy of a liquid.
12. Define coefficient of viscosity.
13. What is meant by space lattice?
14. Define symmetry operation.
15. What does Schoenflies symbol denotes?
16. What is anisotropic crystal? Give example.
17. Write BET equation and explain the terms.
18. What is desorption?

**(6 × 2= 12)**

**PART C**

**III. Answer any four questions. Each question carries 4 marks.**

19. Discuss Andrew's experiment on the isotherms of a real gas.
20. Explain Claude's process for the liquefaction of gases.
21. Explain the two kinds of hydrogen bonding with suitable examples.
22. Distinguish between cubic and hexagonal close packing in three dimensions in detail.

23. Derive Bragg's equation.
24. Differentiate Chemisorption and Physisorption with examples.

**(4 × 4 = 16)**

**PART D**

**IV. Answer any two questions. Each question carries 12 marks.**

25. Derive the relationship between van der Waals' constants and critical constants.
26. Discuss the powder method for the X-ray diffraction studies of crystals and the analysis of diffraction patterns for the cubic lattices.
27. Discuss the stoichiometric defects found in crystals.
28. Discuss Langmuir's adsorption theory and derive Langmuir adsorption isotherm.

**(2 × 12 = 24)**