23129044

**QP CODE: 23129044**

**Reg No** : .....

**Name** : .....

## B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS, OCTOBER 2023

### Fifth Semester

### CORE COURSE - CH5CRT07 - PHYSICAL CHEMISTRY - I

Common for B.Sc Chemistry Model I, B.Sc Chemistry Model II Industrial Chemistry & B.Sc Chemistry Model III Petrochemicals

2017 Admission Onwards

E4C632D8

Time: 3 Hours Max. Marks : 60

**Part A**

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. What is critical volume of a gas?
2. What is average velocity?
3. What is collision freequency?
4. What is the relationship between mean free path and coefficient of viscosity?
5. Why do liqid drops assume spherical shape?
6. What is a unit cell?
7. Explain the occupancy of Oxygen and Sodium ions in $Na_2O$ structure.
8. What is the temperature at which the Hg metal behaves as a superconductor?
9. Classify the two types of thermotropic liquid crystals.
10. What is Freundlich adsorption isotherm?
11. What is the importance of BET equation?
12. What are multimolecular colloids?

(10×1=10)

**Part B**

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. Discuss the compressibility factor of real gases. What is the significance?

14. What is the unit of van der Waal's constant b? How is it related to second virial coefficient B?

15. Discuss the virial equation of state.

16. Discuss the different types of hydrogen bonding. What are its importance?

17. What are Weiss indices and Miller indices? Calculate the miller indices for (6a, 3b, 3c) and (a, b, c) crystal planes.

18. Compare the structure of NaCl and KCl by using Powder method.

19. What are metal excess and metal deficiency defects?

20. Distinguish between physisorption and chemisorption.

21. Write a note on Brownian movement and Tyndall effect.

(6×5=30)

**Part C**

*Answer any **two** questions.*

*Each question carries **10** marks.*

22. What are the postulates of kinetic theory of gases? Derive the kinetic gas equation.

23. What is meant by coefficient of viscosity? How is viscosity determined using Ostwald viscometer?

24. Explain in detail the X-ray diffraction techniques used in the study of crystals.

25. a) Explain electrodialysis method for purification of sols.
    b) Write short notes on sedimentation and streaming potential.

(2×10=20)