QP CODE: 24002415

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Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) SPECIAL REAPPEARANCE EXAMINATIONS, MARCH 2024

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

2021 Admission Only

72F5C0C4

Time: 3 Hours Max. Marks : 60

Part A

*Answer any **ten** questions.*

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

1. What is the significance of van der Waal's constant 'a'?
2. State virial equation of state and explain the terms.
3. What is the relationship between rms velocity and most probable velocity?
4. What is collision freequency?
5. What is hydrogen bonding?
6. How will you rationalize the AX structure composition in Wurtzite?
7. What is intrinsic point defect?
8. What is the temperature at which the Hg metal behaves as a superconductor?
9. What about the flow in smectic liquid crystals?
10. What is chemisorption?
11. What is the importance of BET equation?
12. What is meant by ultrafilteration?

(10×1=10)

Part B

*Answer any **six** questions.*

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

13. What are the causes for deviation of real gases from ideal behaviour?

14. Define critical temperature, critical pressure and critical volume. How are they related to van der Waal's constant a and b?

15. Derive the relation between mean free path and coefficient of viscosity.

16. What is surface tension? How is it determined?

17. What are solids? Differentiate between crystalline and amorphous solids.

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

19. How will you analyze the structure of NaCl by Powder Diffraction method?

20. Distinguish between lyophilic and lyophobic colloids.

21. a) Explain the term micelle and briefly explain their structure. b)What is critical micelle concentration?

(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. Derive the Bragg equation. How will you apply Bragg equation for the analysis of NaCl crystal.

25. What are adsorption isotherms? Discuss the Freundlich adsorption isotherm and Langmuir adsorption isotherm.

(2×10=20)