23108085

QP CODE: 23108085

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) SPECIAL SUPPLEMENTARY EXAMINATIONS, APRIL 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

2020 Admission Only

3CBE52F8

Time: 3 Hours Max. Marks : 60

Part A

*Answer any **ten** questions.*

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

1. What is the SI unit of pressure?
2. Calculate the rms velocity of hydrogen gas at $0^{o}C$.
3. What is collision diameter?
4. What is the relationship between mean free path and coefficient of viscosity?
5. Name any three types of intermolecular forces.
6. Write the cell dimensions of orthorhombic system. Give an example.
7. Calculate the Miller indices of crystal planes which cut through the crystal axes at a) (3a, 2b, c) b) (2a, -2b, 3c)
8. Write the Bragg Equation. Explain the terms.
9. Write two examples of materials showing superconductivity.
10. Distinguish between adsorbent and adsorbate.
11. What is the importance of BET equation?
12. Give an example each for a liquid dispersed in gas and a gas dispersed in liquid.

(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. What is meant by excluded volume? Show that excluded volume is four times the actual volume of the gas molecules.
15. Discuss the virial equation of state.
16. What is surface tension? How is it determined?
17. How will you analyze the structure of NaCl by Powder Diffraction method?
18. Differentiate intrinsic and extrinsic defects.
19. Plot a time temperature graph of liquid crystal. Explain the graph in detail.
20. How is the surface area of adsorbent determined from BET theory?
21. What is meant by coagulation of sols? Describe how it can be done.

(6×5=30)

Part C

*Answer any **two** questions.*

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

22. Explain critical phenomenon using isotherm of Carbon dioxide. How can liquid carbon dioxide be converted to gas without any discontinuity?
23. What is meant by coefficient of viscosity? How is viscosity determined using Ostwald viscometer?
24. Explain the structure of AX type ionic compounds.
25. a) Write short notes on optical properties of colloids.
    b) Explain why lyophilic systems are more stable than lyophobic systems?

(2×10=20)