QP CODE: 24803751

24803751

Reg No : .....

Name : .....

INTEGRATED MSC DEGREE EXAMINATION, JUNE 2024

Second Semester

INTEGRATED MSC BASIC SCIENCE-CHEMISTRY

CORE - ICH2CR04 - BASIC LEVEL IN PHYSICAL CHEMISTRY

2020 Admission Onwards

83ED64CD

Time: 3 Hours | Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Explain and derive Dalton's law of partial pressure from kinetic gas equation.
2. Explain the term khudsen gas.
3. Write a short note on transport propeties.
4. Define compressibiltiy factor.
5. Write the Virial equation of state of a real gas.
6. Explain spreading of liquid.
7. What is Miller indices?
8. Define Bragg's law.
9. What is meant by F-centres?
10. What are the different characterization techniques used in liquid crystals.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Calculate the root mean square velocity of nitrogen at 27 degree celsius and 70 cm pressure. Density of Hg = 13.6 g/cm3
12. Sketch the various modes of vibration of water and carbon dioxide molecule.
13. Write short notes on a) keesom interactions b) Debye interactions c) London interactions

14. What is surface tension? What are its units? How is it measured?

15. Derive Poiseuille's equation.

16. Specify the characteristic features of solids. Illustrate the difference between crystalline and amorphous solids.

17. Compare the ionic structure of NaCl and CsCl.

18. Define liquid crystals and their different types.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Discuss in detail the critical phenomena. Derive the expression for the critical pressure, critical temperature and critical volume of a Van der Waals gas

20. a) Compare viscosity of gases with liquids. b) Explain falling sphere method.

21. a) What are different types of semiconductors? b) Explain superconductivity.

22. a) What are the applications of liquid crystals? b) Explain DSC, PLM and X-ray techniques for LC materials

(2×5=10 weightage)