



21101966

QP CODE: 21101966

Reg No :

Name :

B.Sc DEGREE (CBCS) EXAMINATION, AUGUST 2021

Third Semester

COMPLEMENTARY COURSE - CH3CMT03 - CHEMISTRY- PHYSICAL CHEMISTRY-I

Common to B.Sc Geology Model I, B.Sc Physics Model I & B.Sc Geology and Water Management
Model III

2017 Admission Onwards

8B39638D

Time: 3 Hours

Max. Marks : 60

Part A

*Answer any **ten** questions.*

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

1. Differentiate between amorphous solids and crystalline solids.
2. What do the following stand for in crystal chemistry:
(i) fcc; (ii) bcc
3. What is an inversion centre?
4. Give a sketch of the (222) planes of a bcc lattice.
5. What is surface tension?
6. What is random packing model of liquids?
7. What are semipermeable membranes?
8. Calculate the kinetic energy of two moles of N_2 at $27^\circ C$. ($R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$)
9. Arrive at a relationship between average velocity and RMS velocity of a gas at a certain temperature.
10. Define true solution.
11. What is electrophoresis?
12. What is the significance of triple point in the case of the water system?

(10×1=10)

Part B

*Answer any **six** questions.*





Each question carries 5 marks.

13. Differentiate between n-type and p-type semiconductors.
14. Differentiate between permanent and temporary magnets.
15. Explain the rotating crystal method for the X-ray diffraction studies of crystals.
16. Discuss the thermographic behaviour of solids.
17. A solution of 0.450 g of urea in 22.5 g of water gave a boiling point elevation of 0.17 C. Calculate the molal elevation constant of water.
18. Calculate the RMS velocity, average velocity and most probable velocity for N₂ molecules at 273 K. (M = 28 g mol⁻¹).
19. One mole of water vapour is confined to a 20 litre flask at 270C. Calculate its pressure using van der Waals equation and ideal gas equation.
20. What are emulsions? What are emulsifying agents?
21. State and explain Nernst distribution law.

(6×5=30)

Part C

*Answer any **two** questions.*

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

22. Discuss about crystallographic point groups.
23. Deduce expression for the determination of molecular mass using colligative properties.
24. (a) Describe the phenomenon of the adsorption of solids from a solution.
(b) What is the effect of temperature on adsorption of gases on solids?
25. What is a condensed system? Explain how the phase rule is modified for applying to such a system. Draw a general diagram for a simple eutectic system A–B.

(2×10=20)

