



QP CODE: 19102051



19102051

Reg No : .....

Name : .....

**B.Sc. DEGREE (CBCS) EXAMINATION, OCTOBER 2019**

**Third Semester**

**COMPLEMENTARY COURSE - CH3CMT03 - CHEMISTRY- PHYSICAL  
CHEMISTRY-I**

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

2017 Admission Onwards

513FBED9

Maximum Marks: 60

Time: 3 Hours

**Part A**

*Answer any **ten** questions.*

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

1. What is meant by a space lattice ?
2. What is meant by Hysteresis?
3. What are crystallographic point groups?
4. What are Weiss indices?
5. Define coefficient of viscosity.
6. Give an explanation for Henry's Law.
7. Define osmosis.
8. Calculate the average velocity of O<sub>2</sub> molecules at 28°C.
9. Calculate the most probable velocity of N<sub>2</sub> molecules at 15°C.
10. What are associated colloids?
11. What is electrophoresis?
12. What is meant by a simple eutectic system?

(10×1=10)

**Part B**

*Answer any **six** questions.*

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

13. Discuss about superconductivity.
14. What are the important properties of a point group?





15. The first order diffraction of a beam of X-rays of wavelength 15.4nm from the (100) planes of a crystal occurs at an angle of  $11^{\circ}29'$ . Calculate the distance between the (100) planes.
16. Show that the relative lowering of vapour pressure is equal to the mole fraction of the non-volatile solute for a dilute solution.
17. The vapour pressure of a 5% aqueous solution of a non-volatile organic substance at 373 K is 745 mm. Calculate the molar mass of the solute.
18. Calculate the temperature at which the RMS velocity of nitrogen equals that of  $\text{CO}_2$  at 300 K.
19. Write a short note on Maxwell's distribution of molecular velocities.
20. What is meant by Zeta potential?
- At  $25^{\circ}\text{C}$  an aqueous solution of iodine containing  $0.0516 \text{ g L}^{-1}$  is in equilibrium with  $\text{CCl}_4$
21. solution containing  $4.412 \text{ g L}^{-1}$ . The solubility of iodine in water  $25^{\circ}\text{C}$  is  $0.34 \text{ g L}^{-1}$ . Find the solubility of iodine in  $\text{CCl}_4$ .

(6×5=30)

### Part C

*Answer any two questions.*

*Each question carries 10 marks.*

22. Calculate the number of atoms in unit cell of (a) simple cubic (b) face centred cubic and (c) body centred cubic.
23. What is meant by radial distribution function of liquids? How the structure of liquids can be explained using radial distribution function?
24. Discuss Freundlich adsorption isotherm of a gas on a solid surface. How are the constants in this isotherm equation determined?
25. State the phase rule and explain the terms components and degrees of freedom with suitable examples.

(2×10=20)

