

Seat No.	
----------	--

**B.Sc. (Part - III) (Semester - VI) (CBCS)**

**Examination, October - 2023**

**CHEMISTRY**

**Physical Chemistry (Paper - XV)**

**Sub. Code : 81676**

**Day and Date : Monday, 30 - 10 - 2023**

**Total Marks : 40**

**Time : 02.30 p.m. to 04.30 p.m.**

- Instructions :**
- 1) All questions are compulsory.
  - 2) Figures to the right indicate full marks.
  - 3) Use of scientific calculator logarithmic table are allowed.

**Q1) A) Answer the following in one sentence. [4]**

- a) Write Gibb's phase rule for three component system.
- b) Write an expression for Gibb's Duhem equation.
- c) State opposing reactions.
- d) Define Miller indices.

**B) Select correct alternative for each of the following and rewrite the sentences. [4]**

- a) (100) plane of a crystal is called as \_\_\_\_\_ plane.
  - i) Cubic
  - ii) Diagonal
  - iii) Cube diagonal
  - iv) face
- b) Which of the following is the correct expression for Bragg's law?
  - i)  $n\lambda = 2d \sin \theta$
  - ii)  $2n\lambda = d \sin \theta$
  - iii)  $2\lambda = nd \sin \theta$
  - iv)  $d\lambda = 2n \sin \theta$

**P.T.O.**

c) The distribution of solute between two immiscible solvents is called \_\_\_\_\_ of a substance.

- |                        |                   |
|------------------------|-------------------|
| i) partition           | ii) solvation     |
| iii) both (i) and (ii) | iv) none of these |

d) If the crystal presents the same appearance when it is rotated through  $90^\circ$  then the axes is called \_\_\_\_\_ axis of symmetry.

- |            |          |
|------------|----------|
| i) two     | ii) four |
| iii) three | iv) six  |

**Q2)** Attempt any Two of the following : **[20]**

- What is diffraction of x-ray? Derive Bragg's equation.
- Derive Van't Hoff isotherm equation.
- Give an account of  $\text{FeCl}_3 - \text{H}_2\text{O}$  system of phase rule.

**Q3)** Attempt any Three of the following : **[12]**

- Give applications of distribution law.
- Write a short note on a, 'Eutectic point'.
- Write a short note on a, 'Fugacity and Activity concept'.
- A crystal plane cuts three axes at 2, -1, and  $\infty$ . Find the Miller indices of the plane.
- Write a short note on a, 'Chain reactions'.

