

[2]

UNIT - A - 3112

6. (a) Define screw axis and glide plane. Write down the equivalent position coordinates of the n-glide (\perp_a), d-glide (\perp_b) and $3_1(\parallel c)$ screws axis.
- (b) What is reciprocal lattice and what is its significance in X-ray crystallography?
- (c) Define isogonal symmetry points groups of crystal with example.
- (d) Briefly describe *any one* of the following techniques for crystal growth. (i) Liquid (solvent) diffusion (ii) Slow evaporation (iii) Hydrothermal method.
- 3+2+2+3
7. (a) Derive Braggs law of X-ray diffraction. How are the diffraction angle (θ) and interplanar distance related?
- (b) Write down three differences between crystal and quasicrystal.
- (c) Draw stereographic plane projections (any three) of the following point groups (i) $\bar{6}$, (ii) 4/m (iii) mmm (iv) $\bar{3}$ (v) 2/m (vi) 23.
- (d) What are the symmetry elements present in the following space groups
- (i) $P2_1/c$, (ii) $Pca2_1$, 3+3+3+1

Ex/SC/CHEM/PG/CORE/TH/XI-A/2023

M. Sc. CHEMISTRY EXAMINATION, 2023

(3rd Semester, CBCS)

PAPER: XI-A

[ANALYTICAL CHEMISTRY SPECIAL]

Time : Two Hours

Full Marks : 40

(20 marks for each unit)

Use a separate answer script for each unit.

UNIT - A - 3111

Answer any four questions :

5x4

1. Deduce the polarographic reduction wave equation. What will be the form of this equation for an anodic wave? 4+1
2. (a) Write down the Randles-Sevcik equation as used in CV. Mention the units of the different parameters involved in this equation. 1+2
(b) How do you test for the quasi-reversibility of a redox reaction in CV? 2
3. Define ion-selective electrode. Mention its features. Describe the working principle of carbon dioxide sensor. 2+1+2
4. (a) Briefly describe the construction of an 'OTTLE'. 2
(b) Write a short note on chronoamperometry. 3
5. (a) Distinguish between cathodic stripping voltammetry and anodic stripping voltammetry. 2
(b) Enumerate the principle of solid state fluoride sensor. 3

[Turn over