

(Set-1)

M.Sc.-4th(AP)
Crystallography

Full Marks : 70

Time : 3 hours

Answer Q.No.1 and any five from the rest

The figures in the right-hand margin indicate marks

1. Answer all questions : 2 × 10

- (i) Why filters are used in X-ray studies ?
- (ii) Which element has a K_{α} X-ray line whose wavelength 1.785 \AA ?
- (iii) Deduce the resolving power of Debye-Camera.
- (iv) How does Ewald construction help to interpret X-ray diffraction photographs ?
- (v) Determine the K excitation voltage of copper where λ_{α} for copper is 1.38043 \AA .

- (vi) Define atomic form factor.
- (vii) Give the brief description of Energy Dispersive X-ray Analysis.
- (viii) What are the advantages of neutron diffraction over X-ray diffraction ?
- (ix) What is CT Scanning ?
- (x) What is Patterson function ?

2. Describe the production and properties of X-rays. <http://www.odishastudy.com> 5 + 5
3. Describe the powder method for X-ray diffraction. Discuss the formation of diffraction pattern on the photographic film. 10
4. Obtain the structure factor for simple cubic, body centered cubic and face centered cubic crystals. 10
5. Discuss Fourier synthesis and phase problem in structure analysis. 5 + 5

(Turn Over)

6. Discuss external standard method and direct comparison method for quantitative analysis of different phases. 5 + 5
7. Discuss X-ray fluorescence for identification of elements in alloys or mixtures. 10
8. Discuss small angle scattering and its applications. 5 + 5

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