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2006 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

IV B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS
X-RAY METALLOGRAPHY
(METALLURGY & MATERIAL TECHNOLOGY)

Apr/May 2006

TIME – 3 HOUR
MARK – 80

Answer any FIVE Questions
All Questions carry equal marks

1. Discuss the history of X-radiations. Describe the methods for X-ray production. [16]

2. Write short notes on the following:

(a) Thomson equation [4]

(b) Polarisation factor [6]

(c) Compton effect. [6]

3. Write short notes on the following:

(a) Multiplicity factor

(b) Lorentz factor. [8+8]

4. The first three lines from the powder pattern of a cubic crystal have the following S values : 24.95, 40.9, and 48.05 mm. The camera radius is 57.3 mm. Molybdinum K radiation of wavelength 0.71Ao are used. Determine the structure and lattice parameter of the material. [16]

5. Given a square piece of X-ray film 10 Cm X 10 Cm radiation of =0.152 nm and powdered NaCl with a lattice parameter 0.563 nm, devise a diffraction experiment in such a fashion that the rays from (111) planes produce a circle of diameter 0.1m. [16]

6. Write notes on the following:

(a) Depth of X-ray penetration [6]

(b) Crystal orientation [4]

(c) Special diaffractometer. [6]

7. Explain the following:

(a) Chemical analysis by parameter measurement [5]

(b) Techniques used in stress measurement [5]

(c) What are the errors that can be occurred and how they are classified in the precise parameter measurements? [6]

8. Explain in detail the steps involved in Determination of Phase Diagram by X-ray diffraction methods. Clearly sketch and explain. [16]

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