



MRT 111-1 Crystallography

Number of Questions: Two (02)

Answer **all** questions

Time Allocation: One (01) hour

Marks allocation: 100

01. (a) Describe basic symmetry operations performed on a crystal. Illustrate with examples.

(15 marks)

(b) Sketch three (03) patterns representing symmetry of structural motifs.

(15 marks)

(c) Describe the symmetry content of $4/m\bar{3}2/m$ (Hexoctahedral) crystal class of the isometric (cubic) crystal system.

(20 marks)

02. (a) What are the assumptions of atomic hard sphere model?

(05 marks)

(b) Calculate the Atomic Packing Factor (APF) for a Face Centred Cubic (FCC) crystal.

(20 marks)

(c) Explain the relationship between coordination number and atomic radius in crystalline material.

(25 marks)