

MRT 251-3 Mineralogy and Petrology - II

Instructions to candidates

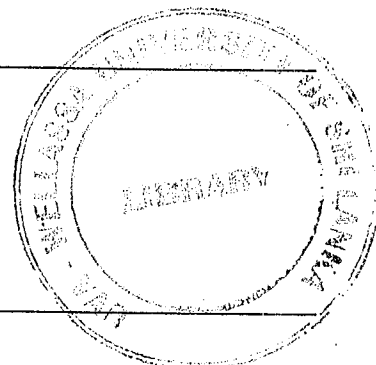
Duration: Three (03) hours

Number of questions: Five (05)

Answer all questions

Mark allocation: 100

Illustrate your answers with sketches/diagrams where necessary



1. Describe the following in detail.

- a) Crystal nucleation and growth with special emphasis on controlling factors.
- b) Crystal intergrowths and defects.

(10 x 2 = 20 marks)

2.

- a) Explain the principle of light polarization and its applications in optical mineralogy.
- b) Briefly describe the functions of the essential components of a polarizing microscope.

(10 x 2 = 20 marks)

3.

- a) Illustrate and explain the "double refraction" phenomenon observed in anisotropic minerals.

(10 marks)

- b) Distinguish between the following features observed in mineral thin sections.
 - (i) Pleochroism and extinction
 - (ii) Relief and birefringence

(10 marks)

4.

- a) Discuss "mineral stability" in the context of thermodynamics principles.
- b) Describe stability of phases using a pressure (P), temperature (T) and free energy (G) plot. Highlight equilibrium condition and phase transition.

(05 marks)

(15 marks)

5.

- a) Explain the uses of "reaction textures" observed in metamorphic rocks. Illustrate your answer with examples and sketches.

(05 marks)

- b) Describe three (03) criteria that can be used to identify "equilibrium mineral assemblages".

(15 marks)

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