

SAMPLE - ERSC2P22 - Midterm

You will have one hour to complete this test.

Answer all questions in the examination booklet provided.

Where appropriate use sketches and graphs to assist in answering the questions.

Marks

- 10 1) Give the mineral name or chemical formula which corresponds to the following chemical formulae or mineral name.
- a) $\text{Ca}_5(\text{PO}_4)_3(\text{OH}, \text{Cl}, \text{F})$
 - b) Zircon
 - c) Fluorite
 - d) $(\text{Mg}, \text{Ca}, \text{Fe}^{2+}, \text{Mn})_3(\text{Al}, \text{Fe}^{3+}, \text{Cr})_2(\text{SiO}_4)_3$
 - e) Nepheline
- 30 2) Briefly explain and distinguish between five (5) of the following pairs of terms, using diagrams where applicable:
- a) wave normal and optic normal
 - b) isochrome and isogyre
 - c) interference colour and birefringence
 - d) relief and Becke line
 - e) isotropic and anisotropic
 - f) parallel and inclined extinction.
- 15 3) Define indicatrix. Draw and label the indicatrix for a uniaxial negative mineral. Label the circular and principal sections, mark on the indicatrix axes, the index of refraction for each indicatrix axis. Mark on the position of the optic axis. Show the vibration directions of the ordinary and extraordinary rays and the corresponding indices of refraction for each ray.
- 15 4) Petrographic microscopes produce plane polarized light. What is plane polarized light and why is it used in optical mineralogy. Include in your answer at least two methods used to produce plane polarized light.