

National University of Ireland, Galway
OLLSCOIL NA hÉIREANN, GAILLIMH

SUMMER EXAMINATIONS 2000

**2nd SCIENCE
GEOLOGY (GE212)**

PAPER TWO

Prof. J.F. Dewey
Prof. P.D. Ryan
Dr. D.M. Williams
Dr. M. Feely

Time allowed: Three hours

Answer four questions: **two** from Section A and **two** from Section B.
Allow about 45 minutes for each question.

Please use separate Answer Books for each section.

Illustrate your answers with neat sketches and diagrams where appropriate.

SECTION A

1. Define the Law of Constancy of Interfacial Angles and the Law of Rational Indices. Then show with the aid of appropriate diagrams how you would calculate the axial ratios for a Tetragonal and an Orthorhombic crystal.
or
Give an illustrated account of the symmetry elements present in the holosymmetric class of each of the seven crystal systems. Briefly comment on some of the forms present in each system.
2. Write notes on the following silicate groups paying particular attention to their atomic structure, chemistry and occurrence in igneous rocks: (a) Amphibole and (b) Pyroxene Groups. Comment on the presence of cleavage in these two groups.
3. Write an essay on the Plagioclase Feldspar series and show how they can be used to classify the common igneous rocks.
4. Write short notes on the following:
 - a) Contact or thermal metamorphism.
 - b) Regional metamorphism.

SECTION B

5. Discuss the influence of the Geology of an area on the rates and directions of ground-water flow.
6. Describe the evolution of Ireland during the Carboniferous period.
7. How did the Pleistocene glaciation affect the geomorphology of Ireland?
8. Briefly discuss TWO of the following:
 - (a) The use of sedimentary structures in determining stratigraphic succession.
 - (b) Geological traps for oil and gas.
 - (c) Disposal of radioactive waste in the Earth's crust.
 - (d) Evidence for the existence of the Iapetus Ocean.