

# University of Dublin

## Trinity College

Matriculation  
Examination

Trinity Term, 2012

### Geology

Wednesday 11<sup>th</sup> April

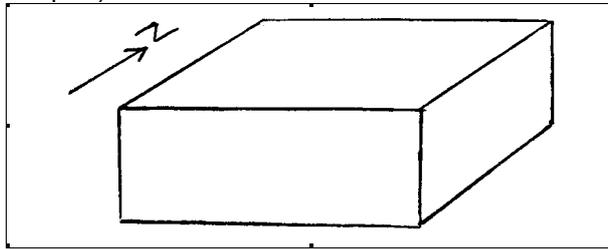
GMB

9.30 - 12.30

Dr I.S. Sanders and Dr P.N. Wyse Jackson

*Answer any **five** questions. Credit will be given for citing examples of geological features you have seen in the field, where appropriate.*

1. Describe the geological processes and rocks associated with a mid-ocean ridge, and explain the origin of the 'striped' pattern of magnetic anomalies that run parallel to mid-ocean ridges. (15 marks). In the context of the plate-tectonic theory, how would you explain the Giant's Causeway? (5 marks)
2. A granite-like rock exposed on the island of Inishtrahull in Co Donegal is 1779 million years old making it the oldest rock in Ireland. Explain the principles of how an age like this can be measured (10 marks). Describe the appearance and occurrence of granite, and name and state the chemical formulae of three minerals normally present in granite (10 marks),
3. Draw four separate block diagrams viewed from the south-east (as shown) to illustrate the following geological structures: (a) strata dipping south-east at 30°, (b) strata dipping west at about 70° separated by an angular unconformity from younger, overlying strata that dip SE at about 30°, (c) a tight symmetric syncline plunging north at 20° whose axial plane is vertical and (d) strata dipping gently west cut by a normal fault that trends north-south and dips at 45° to the west. (5 marks for each part)



4. Describe the nature and discuss the origin of cleavage in (a) rocks and (b) minerals. (14 marks). Give one example each of a mineral that displays cleavage in one direction only, in two directions, and in three directions and give the chemical formula of each mineral. (8 marks)
5. Name any three geological resources that are quarried or mined in Ireland and briefly describe the origin and the use (or uses) of the examples you have chosen.
6. Using clearly labelled drawings describe the general appearance of (a) a trilobite and (b) a brachiopod. Describe the mode of life of each. (15 marks). Name two examples of rock made entirely from the remains of ancient living organisms (5 marks).
7. Write briefly on any **two** of the following topics: (a) deposits associated with ice sheets (b) seismic waves (c) the Earth's core (d) the evolution of hominids.
8. Certain rocks consist of large fragments enclosed within fine-grained material. Name and describe examples of such rocks, and explain how they may have formed.
9. Name and describe the kinds of rock and the kinds of landform associated with volcanic activity on land (10 marks). Why are some eruptions explosive and others not? (5 marks). What risks to Irish society do volcanoes pose? (5 marks)
10. What is sandstone? (4 marks) Describe features that may be preserved in sandstone that allow its environment of deposition and/or its 'way-up' to be inferred. (16 marks)