

University of Dublin

Trinity College

Matriculation
Examination

Trinity Term, 2016

Geology

Wednesday 30th March

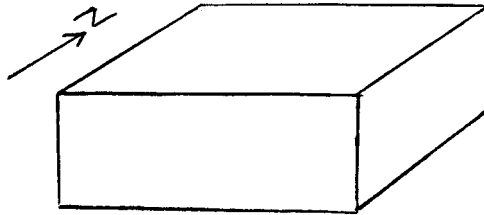
Examination Hall

9.30 - 12.30

Dr P.N. Wyse Jackson

*Answer any **five** questions, illustrating your answers with appropriate diagrams. Credit will be given for citing appropriate examples of geological features you have seen in the field or are familiar with.*

1. Why is the "Pacific Ring of Fire" so named? (5 marks). Describe the major differences between shield and dome volcanoes in terms of their location and appearance, and describe the products of each. (15 marks)
2. Many minerals are valuable commercially while others may be less so. How would you distinguish between each of these pairs of minerals: (a) halite/barytes; (b) quartz/calcite; (c) pyrite/chalcopyrite; (d) hornblende/malachite? (16 marks). Provide a commercial use for one mineral from each pair (4 marks).
3. Draw four separate block diagrams viewed from the south-east (as shown) to illustrate the following geological structures: (a) strata dipping south at 60°, (b) strata dipping south-west at about 50° and cut by a vertical dyke striking north-south, (c) strata folded into a tight symmetric anticline plunging north at 35°, and (d) a syncline with limbs dipping at 60°, and unconformably overlain by younger strata dipping at 25° east (5 marks for each part).



4. Write short notes on any **two** of the following topics: (a) Oil and Gas traps; (b) Offshore gas in Ireland; (c) Building stone; (d) Lead and Zinc mining in Ireland; (e) Copper mining in Ireland; (f) Fracking (10 marks each).
5. Explain **four** of the following seven terms relating to the hydrological cycle: (a) aquifer; (b) artesian well; (c) permeability; (d) porosity; (e) run-off; (f) spring line; (g) water table. Use diagrams where appropriate (5 marks each).
6. Using clearly labelled drawings describe the general appearance of (a) a trilobite and (b) an ammonite. Describe the mode of life of each. (15 marks). What characteristics make a fossil useful for correlating and dating rocks? (5 marks).
7. Outline the major steps in the evolution of vertebrates (12 marks). What were the adaptations animals adopted to be able to live on land? (8 marks).
8. Describe the environment in Ireland and Britain when coal formed (12 marks). In which geological period did this happen? (5 marks) What are the differences between anthracite coal and lignite? (3 marks).
9. Define the term 'Metamorphic grade' (5 marks). Outline the differences between Contact and Regional Metamorphism (10 marks). Name and briefly describe a metamorphic rock produced in each process (5 marks).
10. Write an essay on 'Ireland's granites: their age and formation' (15 marks). How would you determine the age of a granite? (5 marks).

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Instructions to candidates:

Fill in the details at the top of each booklet, then write your name in the bottom-right hand corner of scripts and seal the corner.

Answer any **five** questions, illustrating your answers with appropriate diagrams.

Credit will be given for citing appropriate examples of geological features you have seen in the field or are familiar with.

Begin each answer on a new **page**.

Write the numbers of the questions you have attempted in the **column** provided on the cover of the answer book

If you use more than one answer book tie them together using the green treasury tags.

You may not start the examination until you are instructed to do so by the invigilator.