

University of Dublin

Trinity College

Matriculation
Examination

Trinity Term, 2018

Geology

Wednesday 4th April

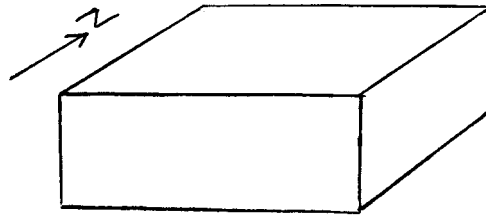
Examination Hall (Public Theatre)

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. What causes earthquakes? (5 marks). How do earthquakes provide evidence for the layered nature of the Earth? (10 marks). Draw a cross section through the Earth and record the thickness of each layer. (5 marks)
2. An economic geologist needs to be able to distinguish commercially valuable minerals. For each of the following pairs of minerals state their chemical formula and outline how you would distinguish one from another: (a) galena/magnetite; (b) pyrite/sphalerite; (c) halite/gypsum. (15 marks). Provide any commercial use for **one** of each pair of these minerals. (5 marks)
3. Draw **four** separate block diagrams viewed from the south-east (as shown) to illustrate the following geological structures: (a) strata dipping west at 40°, (b) strata dipping east at 50° and unconformably overlain by horizontal younger strata, (c) horizontal strata cut by east-west trending faults, producing a graben, and (d) a north-south trending asymmetrical syncline with one limb dipping at 40° and the other at 50°. (5 marks for each part).



4. How does coal form and when was it deposited in Ireland and Britain? (15 marks). How can you distinguish coal from other fossil fuels? (5 marks).
5. How old is the Earth? (5 marks) Explain the concept of radiometric dating (10 marks). How can fossils be used to correlate and date rock successions? (5 marks).
6. Describe, and illustrate with clearly labelled drawings, the general appearance of any **two** of the following: (a) a brachiopod, (b) an ammonite, (c) a graptolite. Describe the mode of life of those selected. (20 marks).
7. Describe the appearance of granite and list the minerals that make up this rock (5 marks). How is granite classified, and how does it form? (5 marks). What type of metamorphism and metamorphic rock is associated with the margins of granite bodies? (5 marks). Where in Ireland can granite be found? (5 marks).
8. Write short notes on **two** of the following topics: (a) Mass extinctions; (b) Fossil hominids; (c) Faults; (d) Subduction. Illustrate your answer where appropriate. (10 marks each).
9. Write a short essay on 'Hydrological Cycle', and include in it the terms 'water table', 'artesian well', 'aquifer', 'run-off' and 'permeability'. (20 marks)
10. How are sedimentary rocks classified? (10 marks). How would you distinguish between the following pairs of sedimentary rocks: (a) Breccia/Conglomerate; (b) Shale/Mudstone; (c) Sandstone/Limestone? (10 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.