

University of Dublin

Trinity College

Matriculation
Examination

Trinity Term, 2019

Geology

Wednesday 17th April

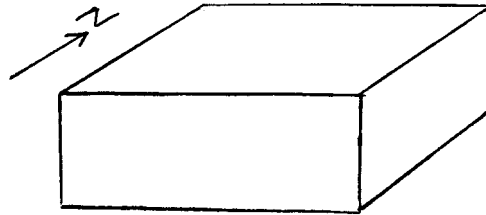
Goldsmith Hall

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. What is meant by the theory of 'plate tectonics'? (5 marks). What mechanism causes plates to move? (5 marks). Draw a cross section through a named oceanic-continental destructive plate boundary and label the major geological features (10 marks).
2. You have been given a collection of five mineral specimens: (1) Quartz, (2) Halite, (3) Gypsum, (4) Calcite, and (5) Baryte. Unfortunately the original labels have been lost. How would you distinguish each of the minerals? (10 marks). Give the chemical formula for each (10 marks).
3. Draw **four** separate block diagrams viewed from the south-east (as shown) to illustrate the following geological structures: (a) strata dipping east at 40°, (b) strata dipping south-west at 50° and cut by a north-south trending dyke, (c) vertical strata overlain by an angular unconformity that dips 30° to the south-east, and (d) a east-west trending symmetrical anticline with limbs dipping at 40° (5 marks for each part).



4. How does oil and gas form? (5 marks). Where are the major oil and gas fields in Britain and Ireland? (5 marks). Describe, and provide quick sketches, of the geological structures in which these hydrocarbons accumulate? (10 marks).
5. Ireland's geological history can be determined through examination of its rocks. For the following three geological periods: (1) Cambrian, (2) Devonian, and (3) Carboniferous, briefly describe the environment at the time (10 marks). Name and describe some rocks types deposited during each period that confirm the environmental interpretation that you provided (10 marks).
6. Describe, and illustrate with clearly labelled drawings, the general appearance of any **two** of the following and comment on their mode of life: (a) a crinoid, (b) a trilobite, (c) a solitary coral (20 marks).
7. Write a short essay on the formation and classification of **either** igneous rocks **or** metamorphic rocks (15 marks). Stone is often quarried for use as a building or decorative stone. Name one igneous rock and one metamorphic rock used for construction or decorative purposes, and state in which part of a building they would be most frequently used (5 marks).
8. Write short notes on **two** of the following topics: (a) Folds; (b) Faults; (c) Joints; (d) Cleavage in rocks. Illustrate your answer where appropriate (10 marks each).
9. What caused the Pleistocene Ice Ages to occur? (5 marks). Write a short essay on glacial landscapes in Ireland and describe features produced **either** by glacial erosion **or** by glacial deposition (15 marks).
10. How are volcanoes classified? (10 marks). Describe the different rock types and products produced during volcanic eruptions (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.