

University of Dublin

Trinity College

Matriculation
Examination

Trinity Term, 2017

Geology

Wednesday 19th April

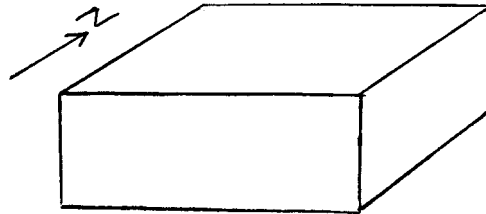
Examination Hall

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. Define the concept of 'Plate Tectonics'. (5 marks). Draw a cross section through an oceanic-continental destructive plate margin and describe the geological features and rocks that are found above this zone. (15 marks)
2. State the chemical formula of each of the following minerals and outline how you would distinguish one from another: quartz, calcite, gypsum, barytes, halite (15 marks). Provide any commercial uses of each 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 east at 60°, (b) strata dipping west at 50° and cut by a vertical dyke striking northwest-southeast, (c) strata dipping east at 30° cut by a normal fault dipping east at 60°, and (d) an east-west trending anticline with limbs dipping at 50°, and unconformably overlain by horizontal younger strata (5 marks for each part).



4. How is oil and gas generated? (5 marks). What characteristics make a rock a suitable reservoir rock for oil and gas? (5 marks). Briefly describe the geological structures where hydrocarbons may get trapped beneath the surface of the Earth, and provide quick sketches of some examples (10 marks).
5. Geologists try to unravel evidence to show what the environment was like in the past. For **both** (a) the Devonian, and (b) the Carboniferous, describe Ireland's environment at the time. Outline the evidence from the rock record that is used to infer the environmental conditions that you describe. (10 marks each).
6. Describe, and illustrate with clearly labelled drawings, the general appearance of any **two** of the following: (a) a trilobite, (b) a crinoid, (c) a solitary coral. Describe the mode of life of those selected. (15 marks). Briefly outline some reasons that caused mass extinctions in the geological past (5 marks).
7. List the names of the geological periods of the Palaeozoic Era from oldest to youngest (5 marks). How have geologists been able to work out (a) the relative ages of rocks in different places, and (b) the actual ages of rocks in millions of years? (15 marks)
8. What do you understand by 'The Ice Age'? (5 marks). Name **three** glacial erosional features and **two** glacial depositional features seen today in the Irish landscape and for each state what caused their formation (15 marks).
9. Write a short essay on 'Folds and Faults'. Include (a) information on what causes them to form, and (b) the different types seen in the geological record. (20 marks)
10. Write a short account of 'The Rock Cycle' (10 marks). How would you distinguish between the three major groups of rocks? (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.