

National University of Ireland, Galway  
OLLSCOIL NA hÉIREANN, GAILLIMH

SUMMER EXAMINATIONS 2000  
First Science Examination

**Earth Sciences, ES101**

Professor J.F. Dewey  
Professor A. Brock  
Professor P. Ryan  
Professor M. Orren

Time allowed : Three hours

Attempt **five** questions : Question 1 is compulsory and must be answered on the accompanying sheet. The remaining four questions should be selected from Question 2 to Question 7 and answered in the Answer Book.

Question 1 carries about twice the weight of the other questions. You should therefore spend between 60 and 80 minutes answering it, leaving between 25 and 30 minutes for each of the remaining four questions.

1. This question is compulsory. Answer it on the accompanying sheet. Write your name and number on the sheet, and include it with you Answer Book at the end of the examination.
2. Seismic methods have been used globally to study the structure of the whole earth, but they have also been used more locally to study the structure of the crust. Outline the basic principles of the seismic method, and explain the main differences between global seismology and crustal seismology, mentioning earth models, sources, ray paths, and travel-time diagrams.
3. Why do earthquakes occur mostly at the boundaries of the tectonic plates?
4. How are metamorphic rocks formed?
5. Discuss why Ireland might have considerable oil reserves.
6. What causes mass extinctions?
7. Write a short essay on pollution of the oceans.