

**BIRKBECK COLLEGE
(University of London)**

BSc EXAMINATION

SCHOOL OF SCIENCE

Department of Earth and Planetary Sciences

GEOLOGICAL HAZARDS (THEORY)

EASC044H6

15 Credits

Friday 15 May 2015

10.00 -13.00

INSTRUCTIONS

Answer THREE questions.

1. How and why can the study of fault slip rates improve understanding of seismic hazards?
2. Give an account of possible earthquake precursors, explaining why they may occur and how they may help forewarn of impending seismic shaking.
3. Answer part (a) and either part (b) or part (c).
 - (a) Describe the components of a volcanic plume generated by a highly explosive eruption and present at least one example to demonstrate that volcanic sulphate aerosols produced during these eruptions have the potential to interfere with solar radiation budgets and lead to global tropospheric cooling. [50%]

Then, EITHER

- (b) Briefly describe the Laki fissure eruption of 1783-1784 and the meteorological conditions at the time, and provide evidence to show that the resulting plume had significant environmental and health impacts in Europe. [50%]

OR

- (c) Give a brief account of the 2010 Eyjafjallajökull eruption and the meteorological conditions at the time, and demonstrate why the ash plume had such a profound impact on air transport and the economy. [50%]
4. Compare and contrast the characteristics of pyroclastic density currents and lahars (you do not need to consider their modes of generation), and then use examples to briefly illustrate the main impacts that these hazards may have.
5. Describe the three components of palaeoflood reconstruction defined by Baker (1989) and discuss the potential value of palaeoflood analysis for flood forecasting.
6. Compare the strengths and weaknesses of deterministic and probabilistic analysis in hazard risk analysis.