

**BIRKBECK COLLEGE  
(University of London)**

**BSc EXAMINATION**

**SCHOOL OF SCIENCE**

**DEPARTMENT OF EARTH AND PLANETARY SCIENCE**

**GLOBAL TECTONICS (THEORY)**

**EASC041H6**

**15 Credits**

**Friday 3 June 2016**

**10:00 -13:00**

**INSTRUCTIONS**

**Answer THREE questions.**

**ALL QUESTIONS CARRY EQUAL MARKS**

**Use diagrams and examples to illustrate your answers.**

- 1) Discuss the evidence for subduction processes on the Earth.
- 2) Give an account of how plate tectonics may have begun on the early Earth.
- 3) Describe the petrological and buoyancy changes that take place in oceanic lithosphere from initial subduction down to the mantle transition zone.
- 4) Between 70 and 50 Ma Greater India moved at rates of  $10\text{--}12\text{ cm yr}^{-1}$ , which is much faster than is possible by pull from a sinking slab (maximum =  $8\text{ cm yr}^{-1}$ ). Explain what other force(s) must have helped to move the Indian plate.
- 5) Compare and contrast the 'thin viscous sheet' and 'crustal channel flow' classes of model for large-scale and long-term deformation of continental lithosphere.
- 6) Describe the evidence for the structure of oceanic lithosphere.

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