



UNIVERSITY OF NORTH BENGAL
B.Sc. Honours 6th Semester Examination, 2021

DSE4-GEOLOGY

PHYSICS AND CHEMISTRY OF EARTH

Full Marks: 40

ASSIGNMENT

The figures in the margin indicate full marks.

Answer any four questions from the following

10×4 = 40

1. Describe Pratt and Airy isostasy with respect to bending of lithosphere. 10
2. What is ophiolite? Why the study of ophiolite is crucial for understanding the geodynamic evolution of subduction zone? Briefly describe how does geochemistry help to identify the tectonic origin of ophiolitic rocks. $3+3\frac{1}{2}+3\frac{1}{2}$
3. (a) Describe briefly the different types of seismic waves. Describe the particle motions relative to the direction of propagation of the two seismic body waves and the two seismic surface waves. 5
- (b) How do seismic wave velocities change at the major discontinuities in the Earth's internal structure? How are these discontinuities characterized? What is average depth of Mohorovicic discontinuity under continents, under oceans, and for the entire world? 5
4. In the solar system, earth possess a unique mode of mantle convection; do you agree to the statement? Justify your answer with suitable explanations. 10
5. (a) How do you calculate epicentral distance of an earthquake from P and S wave travel time data? Explain Wadati diagram and its significance in Earthquake seismology. 5
- (b) What is the brittle–ductile transition in the Earth? What physical properties determine the depth and nature of this transition? 5

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