**EX/SC/GEOL/UG/DSE/TH/01/B/2024**

**B. Sc. GEOLOGICAL SCIENCE EXAMINATION, 2024**

**(3rd Year, 1st Semester)**

**GEODYNAMICS**

**PAPER : DSE 01/B**

*Time* : *Two Hours* *Full Marks* : 40

( *Use a separate Answer script for each Part* )

**PART—I (20 Marks)**

**Answer *any four* questions from the following : 5×4=20**

**1.** Derive the mathematical expression of Rayleigh number in case of mantle convection. How does the number help us to understand the tectonic activities in geological past? 3+2

**2.** What do you mean by 'Isostasy'? Using suitable sketches, write the basic principles of two isostatic models of the Earth. 1+4

**3.** What is the fundamental driving force of the outer core convection of the Earth? How does it differ from the mantle convection? 3+2

**4.** An elastic plate is pinned at both ends and subjected to a horizontal force *P*. Applying the equations of bending theory of thin elastic plate, determine the critical horizontal force required to buckle the plate. 5





**5.** With the help of suitable block diagrams, explain different driving and resistive forces acting on the lithospheric plate boundaries. 5

**6.** Do you think that the mantle convection occurs in two layers within the Earth? Justify your answer with evidence. 5

**PART—II (20 Marks)**

**Answer *any four* questions from the following : 5×4=20**

**1.** How to locate different discontinuities within the Earth's interior using Seismic data? 5

**2.** Describe the self-exciting magneto-hydrodynamo model. 5

**3.** Write short notes (***any two***) : 2½×2=5

*(a)* Secular Variation

*(b)* APW Path

*(c)* Euler Pole

**4.** Describe Wegener Continental Drift hypothesis and its evidences. 5

**5.** Describe the different phases of sea floor spreading with sketches. 5

**6.** Discuss briefly about the mechanism of magnetic banding in sea floor. 5

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