

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**B.Sc. DEGREE EXAMINATION – PHYSICS**

FIFTH SEMESTER – NOVEMBER 2007

**PH 5400 - GEO PHYSICS**

AC 9

Date : 29/10/2007  
Time : 9:00 - 12:00

Dept. No.

Max. : 100 Marks

**Part-A**

10X2=20

**Answer all questions**

1. What is meant by phases in seismic waves?
2. What is a P wave? What is its velocity?
3. What are the quantities that can be measured using seismo meter?
4. Distinguish between Rayleigh and Love seismic waves.
5. Explain the Rictor scale of magnitude for earth quakes in brief.
6. Write down the Laplace's and poisson's equation obeyed by the gravitational potential.
7. What is the cause of the main magnetic field of the earth according to dynamo theory?
8. Write a note on the core of the earth?
9. How are the ages of rocks determined?
10. Give the decay schemes of the radio nuclide  $K^{40}$ .

**Part-B**

(4X7.5=30)

**Answer any four questions**

11. Derive an expression for the gradient of density in terms of velocities of body waves.
12. Outline the principle and construction of the strain seismo graph.
13. Explain the utility of the gravitational potential using a simple illustration.
14. Explain the dynamo theory of earth's magnetism.
15. Discuss the internal temperature of the earth.

**Part-C**

(4X12.5=50)

**Answer any four questions**

16. Describe the major discontinuities of the earth in detail.
17. Obtain the seismo graph equation for a horizontal seismo graph and deduce the two types of instrument that follows the equation.
18. a) State the relation between energy released and the magnitude of an earth quake.  
b) Compare the energies released in earth quakes of magnitudes  $M=6$  and  $M=4$ .  
c) Describe the working of wordan gravity metre with neat diagram.
19. Explain the theory of
  - i) Proton procession magnetometer and
  - ii) Alkali vapour magnetometer(5+7.5)
20. Give the theory of radioactive dating of rocks and minerals using
  - i)the decay scheme of  $Rb^{87}$  and ii)the decay scheme of  $K^{40}$ .

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