

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



M.Sc. DEGREE EXAMINATION – PHYSICS

SECOND SEMESTER – APRIL 2023

PPH2ME02 – GEOPHYSICS

Date: 10-05-2023

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

SECTION A – K1 (CO1)

Answer ALL the questions

(5 x 1 = 5)

1. **Answer the following**

- Name the types of seismic discontinuities on Earth's interior
- The disintegration constant of a radioactive element is 0.00231 per day. Calculate its mean life.
- Neatly draw and name the parts of Horizontal seismograph.
- What is Isochron plot?
- List out the parameters used to find rock properties.

SECTION A – K2 (CO1)

Answer ALL the questions

(5 x 1 = 5)

2. **Answer the following**

- Write Laplace's and Poisson's equation for gravitational potential.
- Which characterization is used for measuring the particle size distribution of rock samples?
- What is shadow zone?
- Differentiate geoid and spheroid surfaces on Earth.
- How does earth show magnetic response?

SECTION B – K3 (CO2)

Answer any THREE of the following

(3 x 10 = 30)

- List the major causes for generation of tsunami waves and outline the steps taken by the Japanese to minimize the damage caused by it.
- Discuss in detail the primary and secondary effects of an earthquake.
- Describe earth's resistivity by single current electrode analysis.
- Validate with relevant examples "Earth as geosphere".
- Illustrate ground penetrating radar model in environmental applications.

SECTION C – K4 (CO3)

Answer any TWO of the following

(2 x 12.5 = 25)

- Explain the various methods of absolute resistivity analysis.
- Outline the significance of dynamo theory of Earth's magnetism.
- Elucidate the role of geochemical data analysis techniques.
- Describe the geological process of rock cycle.

SECTION D – K5 (CO4)

Answer any ONE of the following

(1 x 15 = 15)

- Determine the values of gravity at the following series of points belonging to a gravimetric survey, with a Worden gravimeter specifying the drift correction for each of them.

Station	Time	Reading
A(Base)	8:50	562.5
B	09:21	400.7
C	11:34	438.9
D	13:20	361.1
A	14:33	568.9

(Given : The gravity at the base is 980.13346 gal and the gravimeter constant is 0.30181 mgal/ru).

13. Compile geo-polymerization mechanism in concrete technology.

SECTION E – K6 (CO5)

Answer any ONE of the following **(1 x 20 = 20)**

14. List the various sources of contamination of ground water in Chennai district.

15. Discuss in detail the elastic rebound theory in plate tectonics.

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