

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



B.Sc. DEGREE EXAMINATION – PHYSICS

FIFTH SEMESTER – APRIL 2023

PH 5403 – GEOPHYSICS

Date: 11-05-2023

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

PART – A

(10 x 2 = 20 Marks)

Q. No. Answer ALL questions

- 1 What is seismology?
- 2 Define the focus and the epicenter of an earthquake.
- 3 What do you mean by Guttenberg-Wiechert discontinuity?
- 4 Write down Laplace's and Poisson's equations on gravitational potential.
- 5 The disintegration constant of a radio active element is 0.00231 per day. Calculate its half life and mean life.
- 6 Differentiate between absolute and relative measurements on gravity analysis.
- 7 Calculate S-wave velocity, if the P-wave velocity is 8 km/s and Poisson's ratio is 0.25.
- 8 Write a brief note on composition of core.
- 9 List out the merits and demerits of proton precession magnetometer.
- 10 Why does the earth behave like a bar magnet?

PART – B

(4 x 7.5 = 30 Marks)

Answer any FOUR questions

- 11 Distinguish between body waves and surface waves.
- 12 Discuss resistivity analysis by Wenner and Schlumberger electrode spreads.
- 13 Find the radiation activity of 1 mg (10^{-6} kg) of Sr^{90} . The half-life period of Sr^{90} is 28 years.
- 14 Write a note on geological time scale.
- 15 Write a note on absolute and relative gravimeter.
- 16 What are the primary and secondary effects of earthquake.

PART – C

(4 x 12.5 = 50 Marks)

Answer any FOUR questions

- 17 Obtain the seismographic equation for horizontal seismograph with damping correction.
- 18 Discuss in detail Wiegner's continental drift on plate tectonic theory.
- 19 Describe Potassium argon method of age determination of rocks.
- 20 With a neat diagram explain the working of alkali vapour magnetometer.
- 21 Discuss in detail the gravity analysis by Worden gravimeter.
- 22 a) Determine earth's resistivity by two current electrodes on the surface. (6)
b) Discuss field work analysis of resistivity meters. (6.5)

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