Name: **Enrolment No:**	

End Semester Examination, May 2025

Course: Introduction to Geophysics **Semester: VI**
Program: B.Sc. Geology **Time : 03 hrs.**
Course Code: PEGS3031 **Max. Marks: 100**

Instructions:

I. Write correct unit in numerical after calculation.
II. Draw neat diagram with proper labeling to explain the answer

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	**Mark true or false** **i.** The resistivity method is ineffective for detecting groundwater. **ii.** Seismic reflection is better suited for deep crustal studies than magnetotellurics.	**2*2=4**	**CO1**
Q 2	**Correct the Statement** **i.** Diurnal variation correction is essential in electrical resistivity surveys. **ii.** Magnetotellurics uses artificially generated electromagnetic signals for subsurface imaging.	**2*2=4**	**CO1**
Q 3	**Fill in the Blanks** i. The _____ method measures natural electric potentials in the ground. ii. Disseminated sulfides are best detected using the _____ method.	**2*2=4**	**CO1**
Q 4	**Match the Following** i. Gravimeter (iv) Detects ground motion ii. Proton Magnetometer (iii) Measures subsurface resistivity iii. Resistivity Meter (ii) Records total magnetic field iv. Geophone (i) Measures small gravity differences	**1*4=4**	**CO2**
Q 5	Differentiate between Time-Domain and Frequency-Domain Electromagnetic Instruments. **OR** Apply the concept of two-way travel time to estimate the depth of a reflector in a layered medium.	**1*4=4**	**CO2**

SECTION B **(4Qx10M= 40 Marks)**			
Q.6	**i**. Explain the purpose of sounding and profiling in electrical surveys? **ii.** Differentiate regional and residual anomalies in geophysical survey.	**5*2=10**	**CO1**
Q.7	**i.** Define Bouguer anomaly and state two main corrections applied to calculate it **ii.** Explain the differences between downhole and cross-hole seismic tests.	**5*2=10**	**CO2**
Q.8	**i.** Explain the diurnal correction in magnetic surveys? **ii.** Explain the concept of 'crossover distance' and its use in refraction analysis.	**5*2=10**	**CO3**
Q.9	**Answer any two of the following** **i.** Define the critical angle and its significance in seismic refraction surveys. **ii.** List the differences between seismic reflection and seismic refraction methods. **iii.** A magnetic survey records a total magnetic intensity of 49530 nT at a station. The base station value is 49300 nT. Calculate the magnetic anomaly.	**5*2=10**	**CO4**
SECTION-C **(2Qx20M=40 Marks)**			
Q.10	**i.** A seismic reflection survey records a two-way travel time (TWT) of 3.2 seconds. If the average seismic velocity is 2500 m/s, calculate the depth to the reflector. **ii.** Discuss static, elevation, and NMO corrections in seismic surveys.	**10*2=20**	**CO3**
Q.11	**Answer any Two** **i.** In a seismic refraction survey, the first arrival time at 1000 m offset is 0.8 s. If the velocity of the weathered layer is 500 m/s, and the refracted layer is 2000 m/s, calculate the depth to the refractor. **ii.** Explain the process of CMP gathering and stacking in seismic reflection **iii.** List the corrections applied in seismic reflection data. Explain the use of seismic reflection methods for identifying stratigraphic traps in petroleum exploration.	**10*2=20**	**CO4**