

This question paper contains 4 printed pages]

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

S. No. of Question Paper : 6172

Unique Paper Code : 219503

D

Name of the Paper : GEHT-502 Geophysics

Name of the Course : B.Sc. (Hons.) Geology

Semester : V

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Question No. 1 is compulsory and answer any *four* from the rest.

All questions carry equal marks.

1. Discuss with appropriate figures, the role of seismology in deciphering the internal structure of the earth.
2. (a) What is Induced Potential ?
(b) Discuss in detail how the concept of Induced Potential is utilized as a geophysical exploration tool.
(c) Differentiate between the different methods of I.P. Survey.
(d) Why is a non-polarising electrode used in I.P. survey ?

P.T.O.

3. (a) Distinguish between Vertical Electrical Sounding (VES), Resistivity Profiling and Electrical Imaging.
- (b) In what kind of geological environments would the above mentioned forms of surveying be most useful ?
- (c) With the help of relevant figures, discuss the commonly used VES survey arrays.
4. (a) Discuss with relevant figures the different types of seismic waves.
- (b) What is the relationship between the elastic constants and the velocity of the seismic waves ?
- (c) What do you mean by acoustic impedance and how does its value affect the seismic rays ?
- (d) What is the reflection coefficient of a seismic wave ?
- (e) What will happen to a seismic ray if the reflection coefficient is 0 ?
5. Attempt any *four* of the following :
 - (a) A sedimentary basin with horizontal dipping strata is selected for gravity survey. What kind of result is expected from the survey ?

- (b) What is the commonly used unit for measurement of a gravity anomaly and how is it related to 'g' ?
- (c) Explain the latitude correction for gravity data and why is it required.
- (d) Draw rough sketches of gravity anomalies resulting from a low dipping dyke at :
 - (i) shallow,
 - (ii) intermediate and
 - (iii) deep depths.
- (e) What is isostasy and would there be variation in 'g' values in an area close to isostatic equilibrium ?

6. Answer the following :

- (a) By how many degrees is the magnetic north tilted with respect to the geographic north ?
- (b) How are the magnetic inclination and magnetic latitude related ?
- (c) Distinguish between the secular variations and polar reversals.
- (d) Discuss how the magnetism in rocks is affected by increasing temperatures.
- (e) Discuss the corrections incorporated in the raw magnetic data before the data can be used.

7.
 - (a) What is an ocean floor magnetic anomaly ?
 - (b) Discuss with the help of a diagram, the plate tectonic significance of this anomaly.
 - (c) What is the spread rate of a moving plate with a positive anomaly located 20 kms from the ridge axis and dated to be 0.9 Ma ?
8. What is geophysical well logging ? Discuss with appropriate figures, the commonly used well logging methods.