

Roll No



**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF ENGINEERING  
END TERM EXAMINATION - JUN 2023**

**Semester :** Semester IV - 2021

**Course Code :** PET2014

**Course Name :** Sem IV - PET2014 - Geophysical Methods for Oil and Gas  
Exploration

**Program :** PET

**Date :** 14-JUN-2023

**Time :** 9.30AM -12.30PM

**Max Marks :** 100

**Weightage :** 50%

**Instructions:**

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

**PART A**

**ANSWER ALL THE QUESTIONS**

**(10 X 3 = 30M)**

1. Mention the steps in the data recording process of Worden Gravimeter.  
(CO3) [Knowledge]
2. Draw the standard layouts for shot and receiver point for land and marine seismic survey.  
(CO4) [Knowledge]
3. Write the theory of magnetic survey mentioning the mathematical expression.  
(CO3) [Knowledge]
4. After hydrocarbons have migrated vertically into the seal of the reservoir, they must move to the surface. Hydrocarbons move up to near surface sediments and soil through certain mechanisms. Explain the mechanisms.  
(CO2) [Knowledge]
5. Mention the applications of Foraminifera and Foraminiferal Coloration Index.  
(CO1) [Knowledge]
6. Mention different characteristics of source rock.  
(CO1) [Knowledge]
7. State the mathematical expressions for velocities of S and P waves in homogenous, isotropic media. Also define shear and bulk modulus mentioned in the mathematical expressions.  
(CO4) [Knowledge]

8. Mention and define the natural causes of magnetic anomalies in the magnetic survey. (CO3) [Knowledge]
9. Elaborate different approaches to microbial hydrocarbon prospecting. (CO2) [Knowledge]
10. Write the advantages and disadvantages of seismic survey. (CO4) [Knowledge]

## PART B

### ANSWER ALL THE QUESTIONS

(2 X 15 = 30M)

11. Microseepage is an invisible seep of hydrocarbon migration." Based on the above definition of microseepage, answer the following questions:  
(a) Discuss the evidences of microseepage.  
(b) Distinguish the process of microseepage from macroseepage.  
(c) Describe the any two methods for the identification of microseepage. (CO2) [Comprehension]
12. The reduction of magnetic data is necessary to remove all causes of magnetic variation from the observations other than those arising from the magnetic effects of the subsurface. Mention and explain the different corrections that are applied to the magnetic observation. (CO1) [Comprehension]

## PART C

### ANSWER ALL THE QUESTIONS

(2 X 20 = 40M)

13. Gravity reduction is the process of routine correction of field gravity contrast data between an arbitrary reference point and a series of stations that are influenced by various extraneous effects. Based on the statement, explain all the gravity reduction processes that are used for correction of gravity data. (CO3) [Application]
14. Explain the basic principle of seismic survey and also mention the mathematical expression along with diagram. Describe different sources and receivers that are used for seismic survey in land and marine locations. (CO4) [Application]