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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **End - Term Examinations – January 2025** |
| **Date:** 06 / 01 / 2025 **Time:** 09:30 AM – 12:30 PM |

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| **School:** School of Engineering | **Program:** B.Tech. in Petroleum Engineering |
| **Course Code:** PET2014 | **Course Name:** Geophysical Methods for Oil and Gas Exploration |
|  **Semester**: V | **Max Marks**: 100 | **Weightage**: 50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **24** | **24** | **26** | **26** | **-** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

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| **Answer ALL the Questions. Each question carries 2 marks. 10Q x 2M=20M** |
| **1** | Choose the Correct Answer:The shells of Foraminifera are primarily composed of \_\_\_\_\_\_\_\_\_\_.(A) Calcium carbonate(B) Silica(C) Clay minerals(D) Organic material | **2 Marks** | **L1** | **CO1** |
| **2** | Define a Petroleum Trap. | **2 Marks** | **L1** | **CO1** |
| **3** | Recall a word to Fill in the Blank:Geochemical methods focus on the analysis of \_\_\_\_\_\_\_\_\_\_ composition in rocks, soils, and gases. | **2 Marks** | **L1** | **CO2** |
| **4** | Recall a common limitation of geochemical exploration. | **2 Marks** | **L1** | **CO2** |
| **5** | Choose the Correct Answer:\_\_\_\_\_\_\_\_\_\_ is a type of gravity correction.(A) Bouguer correction(B) Isostatic correction(C) Free-air correction(D) All of the above | **2 Marks** | **L1** | **CO3** |
| **6** | Recall a word to Fill in the Blank:Magnetic surveys use instruments called \_\_\_\_\_\_\_\_\_\_ to measure magnetic field \_\_\_\_\_\_\_\_\_\_. | **2 Marks** | **L1** | **CO3** |
| **7** | Label True or False:(a) Gravity surveying is used for detecting subsurface density variations.(b) Gravity surveys are limited to shallow subsurface investigations. | **2 Marks** | **L1** | **CO3** |
| **8** | Choose the Correct Answer:Seismic reflectance occurs due to \_\_\_\_\_\_\_\_\_\_.(A) Change in density and velocity at a boundary(B) Magnetic anomalies(C) Gravitational variations(D) Atmospheric pressure | **2 Marks** | **L1** | **CO4** |
| **9** | Recall a word to Fill in the Blank:The reflection coefficient is calculated based on differences in \_\_\_\_\_\_\_\_\_\_ and acoustic \_\_\_\_\_\_\_\_\_\_. | **2 Marks** | **L1** | **CO4** |
| **10** | Name the two primary types of seismic waves used in exploration. | **2 Marks** | **L1** | **CO4** |

**Part B**

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| **Answer the Questions. Total Marks 80** |
| **11.** | **a.****b.** | Summarize the importance of calcareous nanofossils and nanoliths in petroleum exploration.Explain how ostracods are used to interpret depositional environments and their relevance to petroleum exploration. | **20 Marks** | **L2** | **CO1** |
| **or** |
| **12.** | **a.****b.** | Interpret a Van Krevelen diagram to evaluate the maturity of a source rock.Describe how hydrocarbon seeps are identified and their implications for exploration. | **20 Marks** | **L2** | **CO1** |
|  |  |  |  |  |  |
| **13.** | **a.****b.** | Explain how seepage acts as a natural indicator of hydrocarbon accumulations and its limitations.Describe the role of geochemical methods during the initial stages of petroleum exploration. | **20 Marks** | **L2** | **CO2** |
| **or** |
| **14.** | **a.****b.** | Explain how geochemical data is integrated with geological and geophysical data to enhance exploration success.Summarize the use of remote sensing techniques in identifying seepage-related anomalies. | **20 Marks** | **L2** | **CO2** |

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| **15.** | **a.****b.** | Explain Elevation Corrections and Tidal Correction applied before interpreting the results of gravity survey. Describe the Principle of Fluxgate Magnetometer. | **20****Marks** | **L2** | **CO3** |
| **Or** |
| **16.** | **a.****b.** | Explain the Principle of the LaCoste and Romberg Gravimeter.Describe Geomagnetic Correction. | **20 Marks** | **L2** | **CO3** |

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| **17.** | **a.****b.** | Explain the Seismic Trace.Illustrate the figure presented below.  | **20****Marks** | **L2** | **CO4** |
| **Or** |
| **18.** | **a.****b.** | Illustrate Common Mid Point (CMP) and Common Depth Point (CDP) surveying.Demonstrate the figure presented below. | **20****Marks** | **L2** | **CO4** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***