

Answer Question No 1 in PART A and only one (1) Question from PART B

PART A

1. Answer **four (4)** questions including the **Question (v)**
- i. Give a labeled sketch of the Earth depicting its major subdivisions. Briefly describe the nature of physical state of each subdivision.
 - ii. Using suitable sketches, describe the difference among ellipsoid, geoid and actual figure of the Earth.
 - iii. Briefly explain the meaning of Standard Figure of the Earth, International Gravity Formula and Gravity Anomalies.
 - iv. Using suitable sketches, briefly describe positive and negative gravity anomalies. Also explain how they arise giving an example for each type.
 - v. What is the physical unit used for the measurement of gravity in Geophysics. Name the instruments that are used for absolute measurement of gravity and relative measurement of gravity. Briefly describe one of the instruments giving the relevant physical principles.

(40 Marks)

PART B

2. Write short notes on any six (6) of the following. Use labeled diagrams where necessary
- i. Common Mid-Point (CMP) gather
 - ii. What is stacking? Why stacking is used in seismic data processing.
 - iii. Normal Moveout (NMO) Correction
 - iv. Advantages of convolution and deconvolution in seismic data processing.
 - v. How physical properties affect seismic wave velocity of a rock.
 - vi. Multiple reflections and their implications on seismic data interpretation.
 - vii. Reflection Coefficient and negative and positive reflections.

(60 Marks)

3.

- i. Using a side label boat diagram, explain how two-dimensional (2D) marine seismic data are acquired.
- ii. Compare advantages, disadvantages and limitations of different seismic sources used for seismic data acquisition.
- iii. Describe why an array of air guns is used as a seismic source rather than a single air gun source in seismic data acquisition.
- iv. What is feathering? Describe how feathering affect seismic exploration and how it could be avoided.
- v. What is *bow-tie* effect? Describe the methods used to collapse *bow-tie* effect from seismic profiles.
- vi. Describe common seismic attributes that directly indicate the existence of hydrocarbon deposits in a sedimentary basin.

(60 Marks)

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