

13012

4

8. (i) Discuss the importance of oxygen isotope studies in reconstructing past climatic conditions.
- (ii) Explain the Rb-Sr dating method and discuss its limitations.

(100)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 13012 L

Unique Paper Code : 32191201

Name of the Paper : Elements of Geochemistry

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

Semester : II

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions.
3. **All** questions carry equal marks.

- . 1. (i) Define Oddo-Harkins effect and explain its significance in geochemistry.

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13012

2

- (ii) Describe the geochemical differentiation of elements within the Earth.
2. Explain the depth wise mineralogical phase transformations in the Earth's crust, mantle, and core.
3. Write short notes on the following :
- (a) Chondrites and their significance
 - (b) Goldich's stability series
 - (c) Half-life in radioactive decay
 - (d) Partition coefficient and its geochemical importance
5. (i) Discuss Goldschmidt's geochemical classification of elements. On what basis is this classification established?
- (ii) Explain Rare Earth Elements (REE). Arrange the following REEs in order of increasing atomic number:

13012

3

La, Ce, Pr, Nd, (Pm), Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu

Also classify these elements into:

- 1. Light Rare Earth Elements (LREE)
 - 2. Middle Rare Earth Elements (MREE)
 - 3. Heavy Rare Earth Elements (HREE)
6. (i) Write a short note on the significance of the Harker variation diagram in the study of igneous rocks.
- (ii) Explain how meteorite studies contribute to understanding the evolution of the Earth and the solar system.
7. (i) Define magma and explain the role of temperature, pressure, and composition in magma evolution.
- (ii) Write a short note on the significance of the Harker variation diagram in igneous petrology.