

Roll No.....

Total No. of Units : 04

Total No. of Printed Pages : 03

Code No. : 01/406

First Semester Examination, Dec. 2018

M.Sc. GEOLOGY

Paper - IV

**GEOCHEMISTRY, INSTRUMENTATION AND
ANALYTICAL TECHNIQUES**

Time : 3 Hrs.

Max. Marks : 80

- Part A and B of each question in each unit consist of very short answer type questions which are to be answered in one or two sentences.
Part C (Short answer type) of each question will be answered in 200-250 words.
- Part D (Long answer type) of each question should be answered within the word limit 400-450.

Unit - I

Q.1 A. What are rare earth elements? (2)

Q.1 B. What is isomorphism? (2)

Q.1 C. Define pseudomorphism and describe various types of pseudomorphism. (4)

OR

Write a note on principles of ionic substitution.

Q.1 D. Describe geochemical classification of elements. (12)

P.T.O.

(2)

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OR

What are stable isotopes? Discuss their nature, abundance and fractionation.

Unit - II

Q.2 A. Define entropy. (2)

Q.2 B. What is energy? (2)

Q.2 C. Write a note on radiometric dating of whole rock. (4)

OR

Discuss the composition of continental crust in brief.

Q.2 D. Describe various laws of thermodynamics and their application in Geology. (12)

OR

Describe the geochemistry of oceanic crust.

Unit - III

Q.3 A. What are compatible elements? (2)

Q.3 B. Define distribution coefficient. (2)

Q.3 C. How elemental partitioning in mineral assemblages is used in P-T estimation? Explain. (4)

OR

Write a note on biogeochemical cycle.

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Q.3 D. Write an essay on geochemical cycle and its geological significance. (12)

OR

Describe the stability of minerals with reference to Eh-pH diagram.

Unit - IV

Q.4 A. The x-ray diffraction analytical technique is based on which law of physics? Mention the mathematical equation also. (2)

Q.4 B. EPMA is a destructive or non destructive analytical technique? Mention the minimum concentration range of an element, that can be measured by EPMA. (2)

Q.4 C. Write a note on the principle of XRF technique. (4)

OR

Discuss the principle and application of modal count technique.

Q.4 D. Describe the principle and application of AAS along with neat labelled diagram. (12)

OR

Describe the principle and application of X-ray diffractometry in Geology.

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