

Sl. No

A-FDN/RB-N-HMB

GEOLOGY

Paper II

Time Allowed : Three Hours

Maximum Marks : 200

INSTRUCTIONS

Please read each of the following instructions carefully before attempting questions.

There are SIX questions divided under TWO sections.

Candidate has to attempt ALL the SIX questions.

ALL the parts in the ONLY question in Section A are compulsory.

In Section B, THREE parts out of FOUR are to be attempted in each of the FIVE questions.

The number of marks carried by a question/part is indicated against it.

All parts and sub-parts of a question are to be attempted together in the answer book.

Attempts of questions shall be counted in chronological order. Unless struck off, attempt of a question shall be counted even if attempted partly.

Any page or portion of the page left blank in the answer book must be clearly struck off.

Answers must be written in ENGLISH only.

Neat sketches are to be drawn to illustrate answers, wherever required.

Section – A

1. Write short notes on each of the following :

5×10=50

- (a) Uniaxial interference figure
- (b) Tectosilicates
- (c) Binary eutectics
- (d) Lamroites
- (e) Granulites
- (f) Injection metasomatism
- (g) Stromatolytes
- (h) Aerinites
- (i) Partition coefficient
- (j) Nuclear-waste management

Section – B

2. Answer any *three* of the following : 10×3=30

- (a) Discuss physical and optical properties of feldspaths. Give their chemical composition and mode of occurrence.
- (b) Discuss application of the Universal stage. Distinguish between 4 and 5-axes Universal stages.
- (c) Discuss classification and chemical compositions of pyroxenes.
- (d) Discuss with neat sketches the symmetry and forms of the Pyrite type.

3. Answer any *three* of the following : $10 \times 3 = 30$

- (a) Discuss the textures and structures of volcanic rocks and their petrogenetic significance.
- (b) With neat labelled diagrams, explain various types of tectono-magmatic settings.
- (c) Draw neat and labelled diagrams only for the crystallization of *three* component magma system, citing an example of feldspar.
- (d) Discuss types of MORB and their tectono-magmatic settings.

4. Attempt any *three* of the following : $10 \times 3 = 30$

- (a) Discuss textural and mineralogical changes that occur during regional metamorphism of pelitic rocks.
- (b) Explain Barrowian and Abukuma types of metamorphism.
- (c) Explain ACF and AKF diagrams and comment upon significance of tie lines.
- (d) Discuss various types of granites and their tectonic affiliations.

5. Attempt any *three* of the following : $10 \times 3 = 30$

- (a) Discuss diagenesis and diagenetic reactions that occur in argillaceous sediments.
- (b) Application of heavy minerals in provenance study.
- (c) Describe various types of sedimentary structures. How they are useful in the palaeogeographic reconstruction ?
- (d) Name important sedimentary basins of India. Comment upon their temporal and spatial distribution.

6. Attempt any *three* of the following : $10 \times 3 = 30$

- (a) Discuss the principles governing abundance of elements in the Universe.
- (b) Discuss geochemical differentiation of elements in the Earth.
- (c) Discuss factors controlling distribution of elements in Primary and Secondary environments.
- (d) Name various toxic elements associated with the mine water wastes. Explain their implications on groundwater contamination.