

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 : . 10×3=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 palaeo-geographic reconstruction ?
- (d) Name important sedimentary basins of India. Comment upon their temporal and spatial distribution.

6. Attempt any *three* of the following : 10×3=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.