

**GEOLOGY**  
**Paper I**

Time Allowed : Three Hours

Maximum Marks : 200

**QUESTION PAPER SPECIFIC INSTRUCTIONS**

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

There are **ELEVEN** questions divided under **SIX** Sections.

Candidate has to attempt **SIX** questions in all.

The **ONLY** question in Section A is compulsory.

Out of the remaining **TEN** questions, the candidate has to attempt **FIVE**, choosing **ONE** from each of the other Sections **B, C, D, E** and **F**.

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

Unless otherwise mentioned, symbols, abbreviations and notations have their usual standard meanings.

Neat sketches are to be drawn to illustrate answers, wherever required. They shall be drawn in the space provided for answering the question itself.

Wherever required, graphs/tables are to be drawn on the Question-cum-Answer Booklet itself.

Attempts of questions shall be counted in sequential 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 Question-cum-Answer Booklet must be clearly struck off.

Answers must be written in **ENGLISH** only.

## SECTION 'A'

(Compulsory Question)

- |       |   |         |
|-------|---|---------|
| 1.    | Describe the following in brief.  | 5×10=50 |
| 1.(a) | Saprock and Saprolite.  | 5       |
| 1.(b) | Parallax, Steroscopic Parallax and Differential Parallax.                 | 5       |
| 1.(c) | Joints and their geometrical classification.                              | 5       |
| 1.(d) | Structural and physiographic features for recognition of the faults.      | 5       |
| 1.(e) | Reynolds number and Froode number.  | 5       |
| 1.(f) | Lithification and Diagenesis.   | 5       |
| 1.(g) | Evolutionary trend of eye in Trilobita.                                   | 5       |
| 1.(h) | Types of dentition in Pelecypods.   | 5       |
| 1.(i) | Lithostratigraphy of Semri Group.   | 5       |
| 1.(j) | Give occurrences and mineral assemblages of Charnockites and Khondalites. | 5       |

## SECTION 'B'

(Attempt any one question)

- |       |   |    |
|-------|---|----|
| 2.(a) | Define D" layer. Explain its complex seismic structure and its significance towards origin of mantle plume.   | 15 |
| 2.(b) | Explain in brief Indian Remote Sensing Satellite (IRS) programme, sensors used in IRS and their applications. | 15 |
| 3.(a) | Explain in brief mineralogical transformation across 410 km discontinuity in mantle.                          | 10 |
| 3.(b) | Define flood plains. Elaborate flood plain morphology with appropriate examples.                              | 10 |
| 3.(c) | Discuss various spectral bands in discriminating major earth surface features.                                | 10 |

## SECTION 'C'

(Attempt any one question)

- |       |   |    |
|-------|---|----|
| 4.(a) | Explain time relationship between microstructure and crystallization of metamorphic mineral during deformation phase. | 15 |
| 4.(b) | Explain geometry of Duplex complexes and their mechanism.   | 15 |
| 5.(a) | Explain relationship of cleavage and schistosity to enter major structures.   | 10 |
| 5.(b) | Define thrust and overthrust. Elucidate the structures associated with the overthrust.                                | 10 |
| 5.(c) | Compare and contrast between the following :  |    |
|       | (i) Coaxial and Non-coaxial deformation.  |    |
|       | (ii) Boudinage and Mullions.  | 10 |

## SECTION 'D'

(Attempt any **one** question)

- 6.(a) Define Ichnofacies and discuss scheme relating Ichnofacies with the depositional environment. 15
- 6.(b) Describe various Primary structures in sedimentary rock and give their significance. 15
- 7.(a) Define parasequence and its relevance in sequence stratigraphy. 10
- 7.(b) Explain depositional features developed under influence of gravity. 10
- 7.(c) Define term Dolomite. Explain conditions in which primary and secondary Dolomites are formed. 10

## SECTION 'E'

(Attempt any **one** question)

- 8.(a) Describe the shell morphology of Gastropod with neat labelled sketch and comment on their stratigraphic range and geological distribution. 15
- 8.(b) What is Taphonomy ? Discuss the various taphonomic processes. 15
- 9.(a) Describe phylogenetic history of Proboscidea. 10
- 9.(b) Explain morphology of an Ostrocod with suitable diagram and comment on its geological distribution. 10
- 9.(c) Discuss evolution of vertebrate over geological time scale. 10

## SECTION 'F'

(Attempt any **one** question)

- 10.(a) Describe mesozoic stratigraphic succession of Spiti valley. 15
- 10.(b) Describe structure, stratigraphy and economic mineral deposits of Dharwar craton. 15
- 11.(a) Describe lithostratigraphy and deformational events of Sausar group. 10
- 11.(b) Give principle of biostratigraphy and explain concepts of biozones. 10
- 11.(c) Give detail account of Delhi super group. 10

