

GEOLOGY (Paper I)

Time Allowed : Three Hours

Maximum Marks : 250

QUESTION PAPER SPECIFIC INSTRUCTIONS

(Please read each of the following instructions carefully before attempting questions)

There are EIGHT questions divided in two Sections.

Candidate has to attempt FIVE questions in all.

Question Nos. 1 and 5 are compulsory and out of the remaining, any THREE are to be attempted choosing at least ONE question from each Section.

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

Wherever any assumptions are made for answering a question, they must be clearly indicated.

Word limit in questions, wherever specified, should be adhered to.

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.

SECTION 'A'

1. Answer the following in about 150 words each: **10×5=50**
- (a) Discuss the characteristics and properties of the lithosphere and the asthenosphere.
 - (b) Differentiate between panchromatic, multispectral and hyperspectral images.
 - (c) Using neat diagrams, classify and describe drainage patterns.
 - (d) Using neat sketches, describe the types of faults in relation to the orientation of the stress axes.
 - (e) Discuss the geometric relationship between cleavage and folding.
2. (a) Describe the types of plate boundaries and comment on the nature of seismicity and volcanism associated with them. **20**
- (b) Describe the landforms produced by wave erosion and from the sediments deposited by longshore currents. **15**
- (c) What are tectonites? Describe their types and their significance using neat sketches. **15**
3. (a) Using appropriate diagrams, describe Ramsay's classification of folds in detail. **20**
- (b) Differentiate between the terrestrial and the Jovian planets. **15**
- (c) Describe various fluvial landforms formed in response to rejuvenation. **15**
4. (a) Compare the geomorphic features along the Eastern and Western coasts of India. **20**
- (b) Discuss the evolution of the foreland basins along the orogenic belts. **15**
- (c) What is Mohr's stress diagram? Describe its significance. **15**

SECTION 'B'

5. Write notes on the following in about 150 words each: **10×5=50**
- (a) Differentiate between a cast and a real shell.
 - (b) Generation of 'Megalospheric' and 'Microspheric' tests in foraminifers.
 - (c) The 'Great Boundary Fault'.

- (d) Butress dams.
- (e) Alkali-aggregate reaction.
- 6. (a) What are the essential characters of rocks to be considered as a construction material? Add a note on aggregates. 20
- (b) Give an account of the evolutionary trends in Equidae. 15
- (c) Discuss the Maleri Beds, their faunal content and age. 15
- 7. (a) Define biostratigraphy. How does it differ from lithostratigraphy and chronostratigraphy? Discuss various types of 'Biozones'. 20
- (b) Explain the principle of electrical resistivity method in the exploration of groundwater. Add a note on vertical electrical sounding. 15
- (c) What is petrification? How does it differ from permineralisation? 15
- 8. (a) What are conodonts and their major types? Briefly discuss their geological history. 20
- (b) Discuss the depositional and climatic conditions during the Siwalik times. 15
- (c) Give an account of various types of rainwater harvesting methods. 15