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 in **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)

1. Describe the following in brief with illustrations, wherever necessary : 5×10=50

(a) Hypogene process of the Earth crust

(b) Application of electromagnetic bands

(c) Progressive deformation

(d) Mohr strain analysis

(e) Hjulstrom diagram

(f) Paleocurrent analysis through primary sedimentary structures

(g) Significance of Ediacara fauna

(h) Significance of spore and pollens

(i) Paleogeography and depositional environments of Siwalik Group

(j) Economic importance of Bastar Craton

SECTION—B

Attempt *any* **one** question

2. *(a)* Describe the key elements of image interpretation with sketches. 15

(b) Explain the geomorphic landforms formed by the action of glaciers with suitable illustrations. 15

3. *(a)* Describe the origin of earthquake and earthquake zones. Add a note on the earthquake-prone zones of India. Comment on any two major earthquakes. 10

(b) Describe the types of resolution and scanners used in remote sensing satellites. 10

(c) Describe the features of the ocean floor. 10

SECTION—C

Attempt *any* **one** question

4. *(a)* Discuss the types of linear and planar structures with sketches. 15

(b) Describe the types of cleavages and schistosity from the multiphase deformal rock. 15

5. *(a)* Describe the types of shear zones and development of shear during the process of deformation. 10

(b) Describe the different types of unconformities and their formation with suitable sketches. 10

(c) Explain the mechanism of genesis of joints in relation to development of micro-fabrics in the rock. 10

SECTION—D

Attempt *any* **one** question

6. *(a)* Discuss the wave-dominated siliciclastic facies model in shallow marine environment with illustrations. 15

(b) Describe the diagenesis of carbonates in shallow marine environment. Add a note on the diagenetic textures of limestone. 15

7. *(a)* Describe the types of systems tracts with illustration. Explain normal and forced regression. 10

(b) Discuss the characteristics of tide-modulated sedimentary structures with suitable sketch. 10

(c) Discuss the processes in the formation of Banded Iron Formations (BIFs). 10

SECTION—E

Attempt *any* **one** question

8. *(a)* Describe the morphology and suture patterns in ammonites. Add a note on their significance in biostratigraphy. 15

(b) Enlist the major mass extinction events in the Earth's history. Discuss the various hypotheses for the cause of mass extinction. Comment on the effects of Deccan Volcanism on K/Pg extinction. 15

9. *(a)* Enumerate the evolutionary trend in Equidae with suitable sketches. 10

(b) Describe the test morphology of foraminifera. Add a note on the application of micro-fossils in solving geological problems. 10

(c) Illustrate with neat sketches the morphology of brachiopods. Enlist the key differences between brachiopods and bivalves. 10

SECTION—F

Attempt *any* **one** question

10. *(a)* Give the Cretaceous stratigraphic succession of Trichinopoly and discuss the lithology and fossils. 15

(b) Describe the tectonic evolution and lithostratigraphic classification of Vindhyan Supergroup and comment on the evolution of depositional environments through time. 15

11. *(a)* Define the kinds of lithostratigraphic units with suitable examples from India. 10

(b) Describe the distribution, classification and stratigraphic succession of Gondwana Supergroup. Explain the depositional environment and occurrence of coal deposits in Gondwana. 10

(c) Give a detailed account of Tertiary succession of Assam. 10

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