

GEOLOGY

Paper—I

Time Allowed : Three Hours

Maximum Marks : 200

INSTRUCTIONS

Candidates should attempt **SIX** questions in **ALL** including Question No. 1, which is compulsory, from Part—I and attempt **ONE** question each from Sections A, B, C, D and E from Part—II.

The number of marks carried by each question is indicated against each.

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

Symbols and abbreviations are as usual.

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

All parts and sub-parts of a question being attempted are to be completed before moving on to the next question.

PART—I

1. Describe the following in 5 to 6 sentences each, with brief sketches, wherever appropriate : 5×10=50

- (a) Creep and solifluction
- (b) Centripetal drainage pattern
- (c) Structure contour maps
- (d) Band ratioing
- (e) Chondrite and achondrite
- (f) Triple junction

- (g) Chronostratigraphic units
- (h) Barren measures
- (i) Coprolites and castings
- (j) Damuda and Rajmahal flora

PART—II

Section—A

2. (a) Classify coasts. List and describe the various coastal landforms. 3+12=15
- (b) What are aerial mosaics? Describe their types and procedures in making them. 15
3. Write notes on the following : 5×6=30
- (a) Drainage pattern in (i) limestone terrain and (ii) fractured and jointed terrain
 - (b) Classification of river channel form
 - (c) Image interpretation elements
 - (d) Supervised classification techniques
 - (e) Image characters of horizontal and dipping sedimentary beds
 - (f) Radiometric and temporal resolution

Section—B

4. (a) Give a detailed account of the processes and mechanics of plastic deformation of rocks involving grain movements. 15
- (b) Explain the stress conditions and mechanism involved in emplacement of dykes and sills. 15

5. Write notes on the following : 5×6=30

- (a) Identifying lithocontacts buried under soil cover
- (b) Ideal creep curve
- (c) Continuous and discontinuous cleavage
- (d) Rotated minerals
- (e) Emplacement by stoping
- (f) Lineaments and their expression in aerial photographs

Section—C

6. (a) List and describe the geological and palaeontological evidences of continental drift. 15
- (b) Give an account of volcanism in relation to plate tectonics. 15

7. Write notes on the following : 5×6=30

- (a) Paired metamorphic belts
- (b) Benioff zone
- (c) Deep structure of the Himalayas
- (d) San Andreas Fault
- (e) Gravity anomaly of oceanic subduction zone
- (f) Intra-plate seismicity in India

Section—D

8. (a) Write in detail about the Archaean rocks of Rajasthan. 15
- (b) Give an account of the iron-ore bearing strata of India. 15

9. Write notes on the following : 5×6=30

- (a) Stratigraphic cycles
- (b) Hierarchy of sequence-stratigraphic units
- (c) Cretaceous succession in Trichinopoly
- (d) Gondwana coalfields of India
- (e) Cretaceous Palaeogene extinction event
- (f) Irrawaddy system

Section—E

10. (a) Explain how Foraminifera are useful for sub-division of Upper Palaeozoic, Upper Cretaceous and Tertiary formations. 15

(b) Give an account of the distribution of Ammonoidea across the geologic time scale. 15

11. Write notes on the following : 5×6=30

- (a) Distribution of Trilobita in the stratigraphic column
- (b) Lithology and fossil assemblage of the Jurassic of Kutch
- (c) Forms of shell in spiral gastropods
- (d) Palaeotemperature estimation using Foraminifera
- (e) Skeleton of graptolites
- (f) Vertebrates of Chinjial and Nagri stages

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