

0005907

A-IGQ-O-JHA

GEOLOGY

Paper I

Time Allowed : Three Hours

Maximum Marks : 200

INSTRUCTIONS

Please read each of the following instructions carefully before attempting the questions :

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 about 100 words each, with brief sketches, wherever necessary : 10×5=50

- (a) Weathering Index
- (b) Vertical exaggeration in aerial photographs
- (c) Harmonic folds
- (d) Types of tectonites
- (e) River terraces
- (f) Active continental margin
- (g) Retrograde evolution
- (h) Krol formation
- (i) Fossil record of vertebrates in Upper Siwalik
- (j) Ecology of Radiolaria

PART II
SECTION A

2. (a) Give a detailed account of morphometric analysis of drainage basins and explain its significance. 15
- (b) What do you understand by Digital Image Processing (DIP) ? Describe its application in mineral exploration. 15
3. Write notes on each of the following 5×6=30
- (a) Glacial erosion and associated landforms
- (b) Landforms associated with mature and old stage of a river
- (c) Speleothems and their utility
- (d) Geostationary and Polar orbiting satellites
- (e) Use of Digital Elevation Model (DEM) in land-use planning

SECTION B

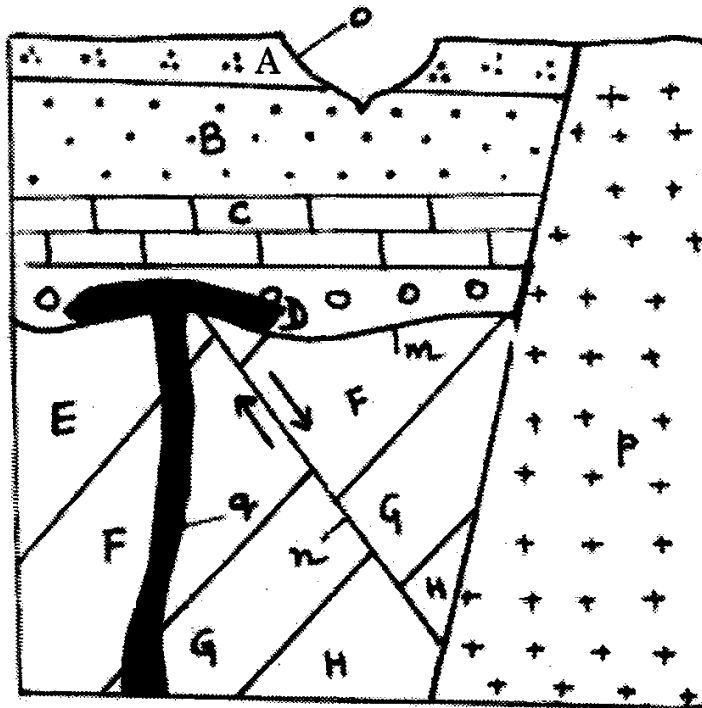
4. (a) Using neat sketches, discuss the mechanism of emplacement of igneous intrusions. Add a note on their economic significance. 15
- (b) Give a detailed account of the measurement of strain in deformed rocks. Briefly write the significance of such measurements. 15
5. Write notes on each of the following : 5×6=30
- (a) Formation of Duplex structure
 - (b) Superposed folding
 - (c) Brittle – ductile deformation of the lithosphere
 - (d) Landforms associated with faults
 - (e) Stress regime during formation of Boudinage

SECTION C

6. (a) How do the earthquakes help us in understanding the internal structure of the Earth? 15
- (b) Describe the driving mechanism for lithospheric plate motion, using suitable illustrations. 15
7. Write notes on each of the following : 5×6=30
- (a) Palaeomagnetism
- (b) Submarine Volcanism and its geological impact
- (c) Characteristic features of Island Arc
- (d) Pull-apart basins
- (e) Geophysical anomalies in mid-oceanic ridges

SECTION D

8. (a) Name the Cretaceous basins of the western coast of India and describe their salient features. 15
- (b) Using the features A – H and m – q in the given geological cross-section, describe the sequence of geological events. 15



9. Write notes on each of the following : 6×5=30
- (a) Ariyalur Formation
 - (b) Permo-Carboniferous Stratigraphy of Kashmir
 - (c) Holocene climatic changes
 - (d) Ophiolites of the Himalaya
 - (e) Banded Gneissic Complex
 - (f) Lameta Formation

SECTION E

10. (a) Discuss the use of Foraminifera in biostratigraphy. 15
- (b) Discuss the concept "Ontogeny recapitulates phylogeny" in case of Ammonoidea. 15
11. Write notes on / Answer each of the following : 6×5=30
- (a) Biostratigraphic classification of Gondwana Supergroup based on floral records.
- (b) Discuss the evolutionary trend of reptiles during the Mesozoic and Tertiary. Add notes on the role of plate tectonics on it.
- (c) Enumerate the various factors which help in the intercontinental migration of animals and plants.
- (d) Mention the characteristic features of placental mammals.
- (e) What is iterative evolution ? Give examples from Cephalopods.
- (f) Evolutionary trend in Apical disc of Palaeozoic echinoids.
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