

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. Write short notes on the following in about 150 words each:— **10×5=50**
- (a) What are the causes of earthquakes? Why the seismic belts are confined to the plate boundaries?
 - (b) Sea-floor spreading and associated volcanism giving suitable examples.
 - (c) Radiometric and temporal resolution of sensor in a satellite.
 - (d) Plotting of strain ellipsoids on a two-dimensional diagram.
 - (e) Fold classification based on orientation of axial plane and hinge line.
2. (a) Describe the erosional and depositional landforms produced by wind. Give Indian examples. **20**
- (b) Why radiometric methods are preferred for age determination of rocks? **20**
- (c) What are major differences between transform and transcurrent faults? **10**
3. (a) What is the significance of geomorphological studies in major civil engineering projects? **20**
- (b) What are the main features that led to the formulation of the continental drift theory? **20**
- (c) Why equal area stereographic projection is preferred for plotting and analyzing structural data? **10**
4. (a) Describe the variation of slope along the longitudinal river profile with a brief note on major landforms produced along the length of a river. **20**
- (b) Describe photo-characteristics of, (i) aeolian landforms (ii) folded sedimentary rocks and (iii) forest cover. **20**
- (c) What is the significance of strain markers in quantification of deformation? **10**

SECTION 'B'

5. Write notes on the following in about 150 words each:— **10×5=50**
- (a) Differentiate between 'body', 'trace', 'index', 'in situ' and 'derived' fossils.
 - (b) Importance of structural studies in location of an oil field.
 - (c) Engineering properties of granite, sandstone, and deccan trap basalt.

- (d) Water bearing characteristics of sedimentary and igneous rocks.
- (e) Application of fossils in palaeoclimatic reconstruction of an area.
- 6. (a) Describe the significance of microfossils in petroleum exploration. **20**
- (b) “Development of landforms is mainly governed by either tectonics or climate.” Justify the statement giving suitable examples. **20**
- (c) What is salt water intrusion? How can it be prevented? **10**
- 7. (a) Describe the significance of intratrappean and intertrappean beds of India. **20**
- (b) Differentiate between the tectonic frameworks of Peninsular and extra-Peninsular India. **20**
- (c) What are the geological investigations required for construction of a gravity dam? **10**
- 8. (a) What are the important features of stratigraphic correlation? **20**
- (b) Describe various methods of ground water recharge. **20**
- (c) What is understood by species concept in palaeontology? **10**