

# IAS Mains Geology 2002

## Paper I

### Section A

1. Answer any three of the following, each within 200 words: ( $20 \times 3 = 60$ )

- What is geochronology? How is it used for the benefit of the earth-science studies?
- Show how structure and lithology are architects of morphology of landforms.
- What is Geographic Information Systems and how is it applied for societal benefits?
- Plunge of folds and direction of movement in fault-planes can be traced by some lineations.

There are other lineations as well produced during folding/faulting episodes. Describe these lineations.

2. Why are volcanoes associated with 'Ring of fire'? Discuss the genesis of a volcano and write a note on their products (60).

3. Describe: ( $30 \times 2 = 60$ )

- Geomorphological studies can be applied to Prospecting of minerals, civil constructional studies.
- Aerial photographs and satellite imageries considerably assist the economies of a country.

4. Answer the following questions

- How are faults identified in the field?
- Classify faults based on their geometry and movement.
- Which landform types are produced by faulting ( $20 \times 3 = 60$ )?

### Section B

5. Write on any three of the following, each within 200 words ( $20 \times 3 = 60$ )

- Evolution of suture-lines of Cephalopods
- What are Outlier, Window, Tatrot beds and Gangamopteris?
- Upper Cretaceous-Lower Eocene igneous activity in India
- Ground-water recharge

6. Write critical notes on the following ( $15 \times 4 = 60$ )

- Geological history of Graptoloids
- Fossil-study and Palaeoclimate inference
- Lower Gondwana flora
- Progressive changes in the evolution of horse

7. Answer the following questions

- a. Litho-, bio-, chrono-and magneto-stratigraphic studies suggest different aspects of stratigraphy. Comment (30).
- b. Describe the Precambrian stratigraphy of Peinsular India (30).

8. Answer the following questions

- a. While certain rocks are excellently water-bearing, others do exist without containing a drop of water. Discuss if this is possible (22).
- b. Answer the questions
  - i. What aspects a geologist should investigate for selecting a tunnel site on a hill-slope?
  - ii. Which rocks are chosen for heavy construction purpose (8)?