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 EIGHT questions in all, out of which FIVE are to be attempted.

Question Nos. **1** and **5** are compulsory. Out of the remaining SIX questions, THREE are to be attempted selecting at least ONE question from each of the two Sections A and B.

All questions carry equal marks. The number of marks carried by a question/part is indicated against it.

Neat sketches may be drawn, wherever required.

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.

Answers must be written in ENGLISH only.

SECTION—A

1. Write explanatory notes on the following within *150* words each : 8×5=40

(a) Island arc and Volcanic arc

(b) What are the geomorphic criteria used in mineral prospecting?

(c) Sensors used in IRS series satellites and their characteristics

(d) Different kinds of unconformities

(e) Genetic classification of faults based on relative movement

2. *(a)* Briefly describe the interior of the earth based on compositional layering and seismic discontinuities. Illustrate your answer with neat labelled sketch. 15

(b) Explain the major drainage patterns and their controlling factors. 10

(c) Discuss how the depth of a fold can be calculated. Enlist the assumptions in the calculation. 15

3. *(a)* What are seismic waves? Give a detailed account on different types of seismic waves. 15

(b) Describe the different types of aerial photographs. Comment on the utility of these in geological studies. Illustrate your answer with neat labelled sketches. 15

(c) What are the various evidences of strain recorded in deformed rocks? How is the amount of deformation calculated? 10

4. *(a)* What is a volcano? Briefly describe elevated and depressed volcanic landforms (three each). 10

(b) Discuss the applications of remote sensing in Geology. 15

(c) Elucidate the relation between cleavage and schistosity to major structures. 15

SECTION—B

5. Write on the following within *150* words each : 8×5=40

(a) Evolution of suture in Ammonoidea

(b) Lithostratigraphic classification and description of rank terms

(c) Pliocene-Pleistocene boundary problem

(d) Various aspects of earthquake resistant structures

(e) Importance of groundwater chemistry

6. *(a)* Describe in detail the morphology of Echinoids. Illustrate your answer with suitable sketches. 15

(b) Discuss the Devonian stratigraphic succession of Garhwal Himalaya. 10

(c) Describe the different types of dams and the forces acting on these. 15

7. *(a)* Discuss the mammalian fossil record of Lower and Upper Siwaliks. Comment on the reasons for decline in fossils from the Upper Siwalik Boulder Conglomerate Formation. 15

(b) Discuss in detail the stratigraphy of the Aravalli Supergroup. 15

(c) What are the different types of groundwater wells? Discuss the characteristics of each well. 10

8. *(a)* Briefly describe the evolution of brain capacity in Hominidae. 10

(b) Describe the structure of Western and Eastern Continental Margins of India. 15

(c) Briefly describe the genetic classification of water. Comment on the different types of aquifers. 15

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