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.

Attempts of questions shall be counted in chronological 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.

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

Answers must be written in ENGLISH only.

Neat sketches may be drawn, wherever required.

SECTION—A

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

(a) Seafloor spreading

(b) Richter scale and modified Mercalli scale

(c) Stereographic projection

(d) Flinn diagram

(e) Multispectral scanner (MSS)

2. *(a)* Describe different radioactive methods applied for determination of the age of the earth. 15

(b) What are aerial photographs? Discuss their utility in interpretation of geological structures and important rock types. 15

(c) Define stress and strain, and write on the behaviour of rocks under deformation condition. 10

3. *(a)* Critically evaluate the role of lithology and structure in the development of landforms. 15

(b) Write on the causes of earthquake. Describe briefly the earthquake belts of the world and seismic zones of India. 15

(c) Define foliation. How does foliation help to decipher associated major structures? Explain. 10

4. *(a)* Describe the genetic classification of faults based on the nature of relative movement. 15

(b) Explain the theory of plate tectonics. Describe different kinds of plate boundaries. 15

(c) Write briefly on Geographic Information System (GIS). How is GIS applied in environmental monitoring? 10

SECTION—B

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

(a) Use of microfossils in correlation and paleoclimatic study

(b) Magnetostratigraphy and paleomagnetism

(c) Hypsometric analysis of drainage basin

(d) Belt of schuppen

(e) Subathu beds and their equivalents

6. *(a)* Discuss the evolutionary trends of Trilobites during Lower Paleozoic Era. 15

(b) Discuss the Cretaceous/Tertiary boundary problem in Indian stratigraphy. 15

(c) Describe the salient geological features required for selection of a tunnel site. 10

7. *(a)* Describe the stratigraphic succession and paleontology of the Jurassic rocks of Kutch. 15

(b) Describe briefly the Siwalik fauna. Add a note on evolution of *Hipparion* and *Equus* during the Siwalik Period. 15

(c) What are the causes of landslide? Mention about the preventive measures of landslide giving Indian examples. 10

8. *(a)* Critically evaluate the processes and rock properties to be considered for artificial recharge of groundwater. 15

(b) Write on evolution of the Himalayas based on modern concepts. 15

(c) Describe precisely the evolutionary trends of the tabulate corals. 10

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