

CSM – 34/21
Geology
Paper – I

Time : 3 hours

Full Marks : 300

The figures in the right-hand margin indicate marks.

*Candidates should attempt Q. No. 1 from Section – A and Q. No. 5 from Section – B which are compulsory and any **three** of the remaining questions, selecting at least **one** from each Section.*

SECTION – A

1. Answer any **three** questions of the following :

$20 \times 3 = 60$

- (a) Write an essay on the origin of the earth. Discuss the interior of the earth and its discontinuities with a neat diagram.
- (b) What are Island arcs ? Discuss the evolution of primary active arcs.
- (c) Describe and differentiate shear joints and tension joints, with a note on the foliation and orientation of foliation within strain ellipsoid.



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(d) What is Geographic Information System (GIS) ? Enumerate, in detail, the various applications of Geographic Information System. 30

2. (a) Write notes on the following : 15+15 = 30

- Give an account on the applications of geomorphology in mineral prospecting, civil engineering and environmental studies.
- Define weathering. Explain the different types of weathering and their products.

(b) Describe the causes and mitigative measures of volcanism. Add a note on the volcanic products. 30

3. (a) Write an essay on the classification and mechanism of folds and faults with neat diagrams. 30

(b) What is an Unconformity ? Describe the different types of unconformities with neat diagrams. Add a note on the method of recognizing the unconformities in the field. 30

4. (a) Describe the causes and effects of earthquakes. Differentiate between Seismograms and Seismographs. 30

(b) What are the basic concepts of geomorphology ? Explain, in detail, the geomorphological subdivisions of Indian subcontinent. 30

SECTION – B

5. Answer any **three** of the following : $20 \times 3 = 60$

(a) Describe the morphology, geological history and the evolution of Cephalopoda with neat sketches.

(b) Define Aquifer, Aquitard, Aquiclude and Aquifuge with examples. Give the classification of Aquifers.

(c) Discuss, in detail, on the geological investigations required for the design and construction of Tunnels and Bridges.

(d) Describe elaborately the Standard Stratigraphic Time Scale.

6. (a) Write an essay on the modes of preservation

of fossils. Add a note on stratigraphic importance of Trilobita. 30

(b) Give a detailed account on the Geology and mineral wealth of Odisha. 30

7. (a) Write an essay on quality of groundwater. Add a note on the salt water intrusion. 30

(b) What is meant by stratigraphic boundary problem ? Explain the Cambrian/Pre-Cambrian and Cretaceous/Tertiary boundary problems. 30

8. (a) What are Pre-Cambrian Rocks ? Describe the Cuddapah and Vindhyan Supergroup of rocks and their economic importance. 30

(b) What are the engineering properties of rocks ? Describe the various types of Landslides, their causes, preventive and rehabilitation steps to be taken. 30

