

Geologists' Exam 2009

Sl. No.

120

A-HFP-J-HB

GEOLOGY

Paper—II

Time Allowed : Three Hours

Maximum Marks : 200

INSTRUCTIONS

Candidates should attempt SIX questions in all including Question No. 1, which is compulsory, from PART—I and attempt ONE question each from Sections A, B, C, D and E from PART—II.

The number of marks carried by each question is indicated at the end of the question.

Answers must be written only in ENGLISH.

Symbols and abbreviations are as usual.

Neat sketches may be drawn to illustrate answers, wherever required.

PART—I

1. Write short notes on any *ten* of the following :

5×10=50

- (a) Abyssal
- (b) Interfacial angle
- (c) Evaporites

- (d) Benthos
- (e) Suspended load
- (f) Pelagic sediments
- (g) Mineral relief
- (h) CCD or calcium carbonate depth
- (i) Retrograde metamorphism
- (j) Greywackes
- (k) Continuous series
- (l) Pyroclastic rocks

PART—II

Section—A

2. Define inosilicates and describe the members of the pyroxene group. Add a note on the changes related to progressive crystallization of a basaltic magma. 30
3. Write short notes on the following : 6×5=30
 - (a) Twin laws of crystals
 - (b) Polymorphs of SiO₂ group
 - (c) Piezoelectricity in minerals
 - (d) Pseudomorphism in minerals
 - (e) Absorption and pleochroism in minerals

Section—B

4. Write an essay on granites and plate tectonics. 30
5. Write notes on the following : 10×3=30
- (a) Crystallization and significance of system diopside-anorthite-albite
 - (b) Contact aureoles
 - (c) Double eutectic as shown by system nepheline-silica

Section—C

6. Write an essay on grain size and grain-size parameters in terrigenous clastic sediments. 30
7. Write short notes on the following : 6×5=30
- (a) Graded bedding
 - (b) Palaeocurrent
 - (c) Heavy mineral application in provenance
 - (d) Alluvial fan
 - (e) Dolomitization

Section—D

8. Write an essay on geochemical cycle. 30
9. Write short notes on the following : 6×5=30
- (a) Geochemistry of hydrosphere
 - (b) Chemical composition and mineralogy of upper mantle
 - (c) Isotopes in petrogenic studies
 - (d) Application of REEs (Rare Earth Elements) in petrology
 - (e) Pathfinder elements in geochemical exploration

Section—E

10. Discuss the environmental aspects relating to an opencast coal mine. 30
11. Write notes on the following : 10×3=30
- (a) Problem of floods in Indian plains
 - (b) Coastal erosion
 - (c) Soil degradation with application of fertilizers
