

2026
(Regular)
Geology (Core)
Paper Code : GL-CE-4224
Paper Name : Igneous Petrology

Time : 2 hours

Full Marks : 45

The figures in the margin indicate full marks for the questions.

1. Choose the correct option : 1×4=4
- a) Anorthosites are dominated by :
 - i) Pyroxene
 - ii) Olivine
 - iii) Plagioclase feldspar
 - iv) Quartz
 - b) The Plutonic rock that is most commonly found in the lower part of the oceanic crust within an ophiolitic complex is -
 - i) Sandstone
 - ii) Rhyolite
 - iii) Granite
 - iv) Gabbro
 - c) Albite-Anorthite system shows :
 - i) Eutectic behavior
 - ii) Complete solid solution
 - iii) Peritectic reaction
 - iv) No crystallization
 - d) Flood basalts are associated with :
 - i) Subduction zones
 - ii) Mantle plumes

Contd.

iii) Transform faults

iv) Ocean ridges

2. Write brief answers to the following questions : $2 \times 3 = 6$

- a) Distinguish between batch melting and fractional melting.
- b) What is meant by ternary phase diagram ?
- c) What are incompatible elements in magmatic systems ?

3. Write short notes on *any three* of the following : $5 \times 3 = 15$

- a) MORB
- b) Magmatic differentiation
- c) Continental flood basalt
- d) Role of volatiles in magmatic systems
- e) Plume magmatism
- f) Petrography significance of Komatiite

4. Answer *any two* of the following : $10 \times 2 = 20$

- a) Give a detailed account of fractional crystallization and explain its role in the evolution of igneous rock compositions.

$7 + 3 = 10$

- b) Describe the phase relations in the Albite-Anorthite system with suitable diagrams.

$7 + 3 = 10$

- c) Discuss the significance of trace elements in understanding magma evolution and tectonic environments.

$5 + 5 = 10$

- d) What are ophiolite complexes ? Discuss their origin and significance in plate tectonics.

$2 + 4 + 4 = 10$

