

2022
Geology (Honours)
Paper : GLG-HC-1026
(Mineral Science)

W

Time : 3 hours

Full Marks : 60

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

1. Answer the following questions : 1×7=7
- a) Which instrument is used to measure the interfacial angle of crystal?
 - i) Spectrophotometer
 - ii) Goniometer
 - iii) Gravimeter
 - iv) The Odolite
 - b) What is the maximum numbers of axis of symmetry found in known crystal system?
 - i) 9
 - ii) 11
 - iii) 13
 - iv) 15
 - c) Crystals formed in Orthorhombic, monoclinic and triclinic systems are termed optically ____. (Uniaxial/Biaxial)
 - d) What is the difference between a crystalline and an amorphous substance?

Contd.

e) Minerals formed in the isometric system are isotropic.

(True/False)

✓f) Define mineral.

g) The ___ system has three mutually perpendicular axes of different lengths. (Orthorhombic/Isometric)

2. Answer briefly the following :

2×4=8

a) Mohs scale of hardness

b) Inosilicates structure with a diagram

c) Significance of accessory plates

✓d) Name four mineral showing metallic lusture.

3. Write short notes on (*any three*) :

5×3=15

a) Wulff net

✓b) Crystallographic projection

✓c) CCP and HCP structures

d) Refractive Index

e) Uniaxial Interference figure

4. Write descriptive answers of the following (*any three*): 10×3=30

a) Define the term 'defect lattice'. Describe various types of structural defects recognised in crystals. Give suitable sketches.

5+5=10

✓b) What is Optical Indicatrix? With suitable diagram, discuss the uniaxial & biaxial Indicatrix.

2+8=10

- ✓c) Describe the physical and chemical properties of feldspar group of minerals. Discuss the atomic structure of this group. $3+3+4=10$
- ✓d) Describe the optical properties of Pyroxene group of minerals. State the differences between pyroxene and amphibole group of minerals. $3+7=10$
- e) Define silicate and non-silicate mineral. Discuss the structures of silicate minerals giving their Si:O with neat sketches. $2+8=10$

