

SEMESTER II
MAJOR COURSE – MJ 2
CRYSTALLOGRAPHY & MINERALOGY
MODEL QUESTION PAPER – SET 2

Full Marks: 75 Time: 3 Hours

GROUP A

Q1. Choose the correct answer. ($5 \times 1 = 5$)

1. The six crystal systems are classified mainly on the basis of: (a) Axial relations and angles (b) Colour (c) Hardness only (d) Specific gravity only
2. Miller indices are used to represent: (a) Crystal planes (b) Mineral colour (c) Cleavage quality (d) Refractive index
3. Which of the following is a non-silicate mineral? (a) Calcite (b) Quartz (c) Feldspar (d) Olivine
4. An optical property caused by the splitting of light into two rays is called: (a) Birefringence (b) Reflection (c) Absorption (d) Dispersion
5. Which mineral commonly shows two directions of cleavage at nearly 90° ? (a) Pyroxene (b) Quartz (c) Feldspar (d) Olivine

Q2. What are crystallographic axes and axial angles? Explain their significance in crystal classification. (5 marks)

Q3. Differentiate between silicate and non-silicate minerals with suitable examples. (5 marks)

GROUP B

Answer any FOUR questions. Each question carries 15 marks. ($4 \times 15 = 60$)

- Q4. Discuss the internal structure and external morphology of crystals. Explain crystal parameters, indices and the six crystal systems. (15 marks)
- Q5. Explain the elements of crystal symmetry and the concept of 32 crystallographic point groups. Add a note on stereographic projection. (15 marks)
- Q6. Describe the classification and chemical composition of common rock-forming minerals. Discuss silicate structures with suitable examples. (15 marks)
- Q7. Explain C.C.P. and H.C.P. structures. Discuss their arrangement of atoms and significance in mineral structures. (15 marks)
- Q8. Describe the properties of light relevant to optical mineralogy. Explain the construction, working and uses of a petrological microscope. (15 marks)
- Q9. Give a detailed account of olivine, pyroxene, amphibole, quartz and feldspar, including their physical, chemical and optical properties. (15 marks)