

Parvatibai Chowgule College of Arts and Science
Autonomous

B.Sc. Semester End Examination, January/February 2022

Semester: I

Subject: Geology

Course Title: Fundamentals of Mineralogy (Core)

Duration: 2 hours

Max. Marks: 45

Instructions:

- i. All questions are compulsory.
 - ii. Figures to the right indicate maximum marks allotted.
 - iii. Answers to the main question must begin on a fresh page.
 - iv. Answers must be relevant to the questions.
 - v. Draw diagrams wherever necessary
-

Q. 1. Answer ANY THREE of the following questions: (09)

- a) Define the term rock. Are rocks and minerals the same? If no, Justify.
- b) How can we distinguish between cleavage and fracture in a mineral hand specimen?
- c) What is coordination number? How is coordination number and radius ratio related?
- d) Explain the terms “Crystal Lattice”, “Unit Cell” and “Motif”.

Q. 2. Answer ANY TWO of the following questions: (12)

- e) Explain in detail the meaning of the term “Mineral”.
- f) Give an account of the abundance of elements in the earth’s crust.
- g) Compare cubic and monoclinic crystal systems.

Q. 3. Answer ANY TWO of the following questions: (12)

- h) Distinguish between ionic, covalent, and metallic bonding.
- i) Compare hexagonal close packing and cubic close packing.
- j) Write a note on elements of symmetry in crystals.

Q. 4. Answer ANY ONE of the following questions:

**P.T.O
(12)**

A)

- i. Why is color not always a useful property in mineral identification? Give an example of a mineral that supports your answer. (4)
- ii. Why does diamond and graphite exhibit different physical properties, when both have the same composition? (4)
- iii. The ionic radius is not a fixed property of a given ion. Justify. (4)

OR

B)

- iv. What is the basis for the classification of minerals into various mineral groups? Why is this important? List six common nonsilicate mineral groups. (6)
- v. Explain the concept of Parameters and Indices. Derive the indices of the crystal face XYZ that has parameters $1a, 2b, 1/2c$. (6)
