

B.Sc. (CBCS) Geology - I Year
Semester - I : Theory Paper - I
Physical Geology and Crystallography

(4 hrs/week)

Credits-4
(60 hours)

UNIT-I

Physical Geology:

Definition of Geology – Basic assumptions of Geology – Its relationship with other sciences – Branches of Geology – Aim and Applications of Geology.

Earth as a Planet: Its shape, size, and density – movement and their effects. Origin and age of Earth. Interior of the earth. Geological processes – exogenic and endogenic, Definition of weathering – Types of weathering of rocks – physical and chemical; Definition of erosion and denudation, agents of erosion, cycle of erosion; erosion, transportation and deposition;

Earth movements: Definition of diastrophism, epirogeny and orogeny – Mountains. Continental drift and plate tectonics.

Wind: Development of characteristic features by wind (arid cycle) erosion and deposition – pedestal rock-mushroom topography Incelberg – Ventifacts – locus – sand dunes.

UNIT - II

Glaciers: Definition of a glacier – types of glaciers – development of typical land forms by glacial erosion and deposition – Cirque, U-shaped valley, Hanging valley, Monadnocks. Moraines, Drumlin, Eskers and Varves, Characteristic features of glaciated regions.

Groundwater: Storage, of ground water – porosity, permeability aquifer, water table, zone of saturation, artesian well, spring, geysers. Development of typical land form by erosion and deposition by groundwater (Karst topography) sinkhole, cavern, stalactites and stalagmites.

Seas: offshore profile – land forms of sea – marine deposits and coral reefs. Lacustrine (Lake) deposits.

UNIT - III

Rivers: Erosion, Transportation and deposition of river (fluvial) cycle in different stages – Development of typical land forms by river erosion and deposition. V-shaped valley. Waterfall, alluvial fans, Natural levees, Meander, Ox-bow lakes, flood plains, Peneplain and Deltas. Types of rivers.

Earthquakes: Causes and kinds of earthquake waves, and mode of propagation, intensity of earthquakes, Richters scale – seismograph and seismogram. Effects of earthquakes,

Volcanoes: Origin, products of Volcanoes.

UNIT-IV

Crystallography : Definition of a crystal – amorphous and crystalline states, Morphology of Crystals – face, edge, solid angle, interfacial angle.

Forms: Simple, combination, closed, and open forms.

Symmetry: Plane, axis, centre, crystallographic axes, Parameters, indices; crystallographic notation – parameter system of Weiss, index system of Miller.

Classification of Crystals into 7 Systems.

Morphological study of the following classes of symmetry.

- I. Cubic system – Normal class -Galena type
- II. Tetragonal system – Normal class -Zircon type
- III. Hexagonal system – Normal class - Beryl type
- IV. Trigonal system- Normal class - Calcite type
- V. Orthorhombic system – Normal class - Barytes type
- VI. Monoclinic system – Normal class - Gypsum type
- VII. Triclinic system – Normal class - Axinite type

Practicals : (3 hrs/week)

45 hrs (Credits: 1)

1. Study of Symmetry Elements of Seven Crystal Systems – Orientation and description of crystals from different crystal systems
2. Study of important geomorphological models and charts

Text Books:

1. Holmes Principles of Physical Geology by D.L.Holmes (1978).
2. Physical Geology by A.N.Stracher (1981).
3. An introduction to Crystallography - R.C.Phillips.
4. Essential of Crystallography - E.Flint.
5. A text book of Mineralogy E.S.Dana and W.E.Ford.
6. Elements of Crystallography - F.A..Wade & R.B.Mattox.
7. Elements of Mineralogy - Rutlelys.

References:

1. Basic Physical Geology by E.S.Robinson (1982).
2. The evolving Earth: A text in Physical Geology by E.S.Sawkins et al., (1978).
3. Physical Geology by B.F.Mallory and D.N.Gargo (1979).

FACULTY OF SCIENCE
B.Sc. (CBCS) - I Year Examination
GEOLOGY
Semester-I : Paper I
(Physical Geology and Crystallography)

Credits : 4
Max.Marks:40

Time: 2 Hours

Section-A (Marks: 4 x 2 = 8)
Write short notes on any four of the following:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

Note: Two short answer type questions from each unit.

Section-B (Marks: 4 x 8 =32)
(Essay questions)

1. a)
 or
 b)
- 2.a)
 or
 b)
- 3.a)
 or
 b)
- 4.a)
 or
 b)

Note: Two essay questions from each unit with internal choice.

FACULTY OF SCIENCE
B.Sc. (CBCS) - I Year Practical Examination
GEOLOGY
Semester-I : Paper I
(Physical Geology and Crystallography)

Credits : 1
Max.Marks:25

Time: 2½ Hours

Practical Model Paper

- 1) Identify the given crystal models 1-6 and write their crystal system, symmetry elements, forms and miller indices. (6x2 = 12 M)
 - 2) Identify and add a note on the given geomorphological feature from model/chart 7-8 (2X4 = 8 M)
 - 3) Record & Viva (5 M)
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