

# **GEOLOGY**

## **GROUP - A**

### **General and Structural Geology :**

An introduction to Geology - its scope, subdivision and relation to other branches of Science. Rocks- their definition and types, Geological time and its major divisions.

The earth -- its origin, age, constitution and relation the other planets in the solar system.

Weathering of rocks, Geological work done by river, glacier, wind, sea. Volcanoes -- types, distribution, products and Geological effects, Earthquakes - causes, distribution and effect. Earthquake Waves, Meaning of the term - Ground water, Water Table, Artesian well, Ewuifer and Springs.

Basic concepts of Geomorphology. Normal cycle of erosion. Drainage patterns. Land forms formed by the action of water, Ice and wind.

Structural Geology - Clinometer compass and its use, primary and secondary structures, Dip and strike and the representation. Folds, faults, joints and unconformities- the definition, description, classification and recognition preliminary ideas of foliation sonialosely of lination ideas about geosyncline, mountain building, isostasy and continental drift. Structural features of India.

## **GROUP - B**

### **Paleontology :**

Fossils -- definition, conditions and types of preservation, Uses of fossils in Geology, Board division of the fossils into micro and microfossils, Vertebrate and invertebrate fossils, Paleobotany.

Morphological feature and geological distribution of branchiopods, bivalve (lamellibranchs), gastropods cephalopod and trilobites.

## **GROUP - C**

### **Crystallography and mineralogy :**

**Crystallography :** Crystalline and amorphous substances. Crystall - its definition and morphological characters. Axes, axial ratio, parameters, indices, crustal forms and zones. Symmetry elements of crystals, Symmetry elements of the normal classes of the Cubic. Tetragonal, Hexagonal, Orthorhombic and Monoclinic systems. Twinned crystals.

**Mineralogy :** Principles of optics, Polarisation of light, Petrological Microscope, Construction of the Nicol Prism, Isotropic and anisotropic substances, Refractive index and birefringence, Interference colours, Pleochroism, Extinction and extinction angles.

Physical, chemical and optical properties of the following groups of minerals - feldspar, pyroxene, amphibolite, olivine, mica and garnet, physical, chemical and optical properties of the following minerals - quartz, beryl calcite, tourmaline, apatite, sillimanite, magnetite, hematite, andalusite and zircon.

Petrology, Economic Geology and Stratigraphy.

## **GROUP - D**

### **Petrology**

Rocks - their types and distinguishing characters, Igneous rocks - Magma, its composition and crystallisation. Magmatic, differentiation and assimilation. Bowen's's

reaction principle, Modes of occurrence of igneous rocks. Structures and texture of igneous rocks. Classification of igneous rocks mineralogical and quasichemical.

Brief description of the following rock types - Granitiplite, rhyolite, gabbro, dolerite, basalt, granodiorite, diorite, trachyte, syenite, syenite and pegmatite.

Sedimentary petrology - Sedimentary processes and product, An outline classification of the sedimentary rocks, Important sedimentary structure - bedding, current bedding graded bedding, ripple marks and mudcracks.

Types of sedimentary deposits - residual, chemical and transported, brief descriptions only.

Petrographic description of the following rock types - sand-stone, greywacke, arkose, limestone, conglomerate and marl.

Metamorphic petrology - definition, types and agents of metamorphism, Distinguishing characters of metamorphic rocks, Depth zones of metamorphism. Grades of metamorphism, Regional metamorphism of argillaceous sediments.

Petrographic description of the following rock types - Slate, Phyllite, Schist, Gneiss, Granulite, Marble and Amphibolite.

## **GROUP - E**

### **Economic Geology:**

Meaning of the term, Formation of Economic mineral deposits, Ore, ore minerals and gangue, Simple classification of ore deposits, Brief study of the modes of occurrence, Origin, distribution in India and Economic uses of the following gold - Ores of iron, Manganese, Copper, Aluminium and Chromium and Muscovite, Sillimanite, Coal and Petroleum deposits, Limestone deposits of Assam and their use.

Physical characters, chemical composition, occurrence and use of the following - graphite, diamond, pyrite, chalcopyrite, chromite, sillimanite, asbestos, corundum, barite, dolomite, fluor spar and galena.

## **GROUP - F**

### **Stratigraphy :**

Laws of stratigraphy, Classification of the rocks into Lithostratigraphical and Biostratigraphical.

Absolute age, An outline geology of the Indian subcontinent, Study of the following with respect to their Lithology - fossil contents (if any) and economic importance Precambrian rocks of Karnataka. Vindhyan of the Son Valley; Triassic of Spiti, Jurassic of catch and Cretaceous of Assam (NE India).

Study of the following rock types from the Indian stratigraphy - Charnokite, Khondalite, Mylonite granite, Deccan traps and Sylhet traps.