

GEOLOGY (Code No. 16)

PART - I

1. General Geology and Geodynamics

Solar system, the earth - its origin, age and interior of the earth. Volcanoes: types, distribution, causes and effects. Earthquakes : intensity, magnitude, distribution causes and effects. Elementary ideas about isostasy, Geosynclines, mountain building, continental drifting, sea floor spreading, palaeomagnetism and plate tectonics.

2. Geomorphology

Basic concepts, External and internal process. Rock weathering, cycle of erosion. Fluvial landforms and drainage patterns. Landforms of aeolian, marine, glacial and 'karst' landscapes. Elements of Remote sensing.

3. Structural and field geology

Primary and secondary structures. Dip and strike of beds. Clinometer compass and its use. Description, Classification and recognition of folds, faults and unconformities. Description and classification of joints, foliation and lineation. Effects of folding and faulting on outcrops. Elementary idea about rock deformation.

PART - II

1. Crystallography

Elements of crystal and crystal symmetry. Laws of crystallography. Symmetry elements and forms of normal classes of seven crystal systems. Twinning in crystals.

2. Mineralogy

Principles of optics, refractive index, double refraction, pleochroism and extinction. Uses of simple polarising microscope. Physical, Chemical and optical properties of following mineral groups : Quartz, Feldspar, Mica, Pyroxene, Amphibole, Olivine, Garnet, Chlorite, Carbonates, and Zeolites. Silicate structures.

3. Economic Geology

Ore, Ore mineral and gangue. Classification of ore deposits. Important processes of ore formation. Occurrence, origin and distribution of following ores in India - Aluminium, Chromium, Copper, Gold, Lead,

Zinc, Iron, Manganese. Deposits of minerals used as abrasives, refractories and in ceramics. Deposits of coal and petroleum.

PART - III

Introduction to petrology, classification of rocks and their distinguishing characters.

1. Igneous Petrology

Origin of magma and formation of igneous rocks. Bowen's reaction series and reaction principle. Crystallisation of binary systems. classification of igneous rocks. Forms, Textures and structures of igneous rocks. Composition, texture origin and mode of occurrence of Granite, Syenite, Diorite, Mafic and Ultramafic groups, Anorthosites and Alkaline rocks.

2. Sedimentary Petrology

Origin, classification, textural and mineralogical characteristics of sedimentary rocks. Structures of sedimentary rocks. Elementary idea about the origin and characteristics of sandstone, conglomerate, limestone, breccia and shale.

3. Metamorphic Petrology

Types and factors of metamorphisms, Zones, grades and facies of metamorphism. Regional and contact metamorphism. Textures and structures of metamorphic rocks. Metamorphism of argillaceous, arenaceous sediments and impure limestone. Metasomatism. Composition, structure and origin of schist, Gneiss, marble, amphibolite, charnockite, gondite and Khondalite.

Part - IV

1. Stratigraphy

Principles of stratigraphy, Basic concept of Lithostratigraphic, Chronostratigraphic and Biostratigraphic units. Criterion of stratigraphic correlation, Physiographic divisions and outline of stratigraphy of India. Brief study of Dharwar, Vindhyan, Gondwana supergroups and Siwaliks with reference to their major subdivisions, lithology, fossils, geographic distribution and economic importance.

2. Palaeontology

Fossils and Fossilization. Mode of preservation and uses of fossils. Study of morphology and geological history of brachiopods, gastropods, lamellibranchs, Ammonites, Corals, Trilobites, Echinoids and Gondwana flora.