SUBJECT : GEOLOGY
PART - 1

1. **Physical Geology :** Solar system and the Earth Origin age and internal constitution of Earth, Weathering, Geological work of river lake, glacier, wind, sea and ground water, Volcanoes-types, distribution, geological effects and products. Earthquakes-distribution causes and effects. Elementary ideals about geosynclines, isostasy and mountain building continental drift, sea floor spreading and plate tectonics.

2. **Geomorphology:** Basic concept of geomorphology, Normal cycle of erosion, drainage patters, landforms formed by ice, wind and water.

3. **Structural and Field Geology :** Clinometer compass, and its use, Primary and secondary structures, Representation of altitude, slope, strike and dip, Effects of topography on out crops, Folds-Fault -unconformities-and Joints-their description classification recognition in the field and their effects on out crops. Criterial for the determination of the order of superposition in the field. Nappers and Geological windows, Elementary ideas of geological survey and mapping.

PART -II

1. **Crystallography** : Crystalline and amorphous substance Crystal, its definition and imorphological characteristics, element of cystle structure, laws of Crystallography, symmetry elements of crystals belonging to normal class of seven Crystal systems. Crystal habit and twinning.

2. **Mineralogy** : Principles of optics, Behaviour of light through isotropic and anisotropic substances, Petrological Microscope, construction and working of Nico Prism, Bire-fringence, Plechroism, extinction, Physical, chemical and optical properties of more common rock-forming minerals of following groups, quartz, feldspar, Mica, amphibole, pyroxene, clivine garnet, chloride and carbonate.

3. **Economic Geology** : Ore, ore mineral and gangue, outline of the processes of formation and classification of ore deposits, Brief study of mode of occurrence, origin, distribution (in India) and economic uses of the following : gold ores of iron, manganese, chromium, copper, aluminium lead and zinc, mica, gypsum, magnesite and kyanite, diamond Coal and petroleum.

PART -III

PETROLOGY:

1. **Igneous Petrology:** Magma its composition and nature crystallization of magma, Differentiation and assimilation Bowne's reaction principle, Texture and structure of igneous rocks. Mode of occurrence and mineralogy of igneous rocks. Classification and varieties of igneous rocks.

2. **Sedimentary Petrology** : Sedimentary process and products. An outline classification of sedimentary rocks, Important primary sedimentary structure (Bedding, cross-bedding graded bedding, ripple marks, sole structure, parting lincation). Residual deposits, their mode of formation, characteristics and important types.

Classic deposits, their classification, mineral composition and texture. Elementary knowledge of the origin and characteristics of quartz arenites, arkoses and grey-wakes, Soliceous and calcareous deposits of chemicals and organic origin.

3. **Metamorphic Petrology** : Definition agents & types of metamorphisms, Distinguishing characters of metamorphic rocks. Zones grade of metamorphic rocks, texture and structure of metamorphic rocks. Basic of classification of metamorphic rocks. Brief Petrographic description of quartzite, slate, Schist, gneiss marble and hornfels.

PART-IV

1. **Palcontology** : Fossils, conditions for entombent, types of preservation and uses. Broad morphological features and geological distribution of brachiopods, bivalves (lamcllibranches), gastro-pods cephalopods, trilobites, echinoids and corals. A brief study of Gondwana flora and Siwalik mammals.

2. **Statigraphy** : Fundamental laws of stratigraphy, Classification of the stratified rocks into groups, systems and series etc. and classification of geologic time into eras, periods and epochs. An outline Geology of India and a brief study of the following systems with respect to their distribution, lithology, fossil interest and economic importance, if any-Dharwar, Vindhyah Gondwana and Siwalik.