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Geology Syllabus for Uttarakhand State Civil Services
Preliminary Exam-2011

GEOLOGY

PART – I

- (a) **Physical Geology:** Solar system and the Earth Origin, age and internal constitution of Earth. Basic concepts of geosynclines and isostasy. Plate tectonics-mountain building, seafloor spreading and Continental drift. Weathering, erosion, transportation and deposition by nature agencies. Earthquakes-distribution, causes and effects. Volcanoes-types, causes, distribution and products.
- (b) **Geomorphology:** Basic concepts of Geomorphology. Cycle of erosion. Drainage patterns. Landforms formed by river, under ground water, glacier wind and sea.
- (c) **Structural Geology:** Primary and secondary structures-lineation, foliation, folds, faults unconformities and joints; their description, classification and recognition. Mechanics of folding and faulting. Effects of fold and faults on outcrops. Nappes and geological windows.
- (d) **Field Geology:** Topographic, structural and geological maps. Representation of altitude, slope, strike and dip in topographic and geological maps. Clinometer Compass and its use. Criteria for the determination of order of superposition of beds.

PART – II

- (a) **Crystallography:** Crystal, crystalline and amorphous substances. Morphological characteristics and crystal structures. Laws of crystallography. Symmetry elements and forms of the normal class of seven crystal systems. Crystal habits and twinning.
- (b) **Mineralogy:** Physical, chemical and optical properties of minerals. Isotropic and anisotropic substances. Birefringence, Pleochroism and extinction. Construction and uses of nicol prism.
Silicon-Oxygen, tetrahedral and classification of Silicates. Physical properties, chemical composition, optical properties and mode of occurrence of quartz, feldspar, feldspathoid, olivine, pyroxene, amphibole, garnet and mica group of minerals and calcite, tourmaline, zircon, sphene, staurolite, Kyanite, apatite and chlorite.
- (c) **Economic Geology:** Economic mineral deposits-metallic and non-metalliferous deposits, Ore, ore mineral and gangue. Processes of the formation and classification of economic mineral deposits. Mode of occurrence, distribution in India, genesis and used of gold, ores of iron, manganese, uranium, chromium, copper, aluminium, lead and zinc, mica, gypsum, magnesite, kyanite, diamond, coal and petroleum. Mineral wealth of Uttarakhand State.

PART - III

Petrology

- (a) **Igneous Petrology:** Magma-its composition and nature, crystallization of magma, Differentiation and assimilation. Bowen's reaction principle. Mode of occurrence, texture, structure, mineralogy and classification of igneous rocks. Petrographic description of granite, granodiorite, syenite, diorite, gabbro, dolerite, basalt, anorthosite and dunite.
- (b) **Sedimentary Petrology:** Formation of Sedimentary rocks. Primary sedimentary structures. Bedding, Cross bedding, graded bedding, ripple marks and sole structure. Texture and classification of sedimentary rocks: Residual, clastic and non-clastic (siliceous and calcareous deposits of chemical and organic origin). Origin and characteristics of Quartz arenites, arkoses and graywackes.
- (c) **Metamorphic Petrology :** Agent and types of metamorphism, Textures, Structures, Zones, Grades, Facies and classification of metamorphic rocks. Petrographic description of quartzite, Phyllite slate, schist, gneiss, marble, amphibolite, khondalite and gondite.

PART – IV

- (a) **Palaeontology:** Fossils-conditions for Preservation and Modes of fossilization and uses. Broad morphological features and geological distribution of brachiopods, lamellibranchs, gastropods, cephalopods, trilobites, echinoids and corals. A brief study of Gondwana flora. Evolutionary history of horse, elephant and man.
- (b) **Stratigraphy:** Fundamental laws of Stratigraphy, stratigraphic classification and nomenclature. An outline geology of India and a brief study of the various geological systems with respect to their distribution, lithology, fossil content and economic importance. Stratigraph of Uttarakhand Himalaya.