YVUCET-2020: SYLLABUS

Test – 109: Geology
Section-A (Marks 30)

General aspects. 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 the earth.
Geological process - exogenic and endogenic. Definition of weathering- types of weathering of rocks- Physical and chemical; Definition of erosion and denudation, cycle of erosion;erosion, transportation and deposition; agents of erosion.

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,meander, ox-bow lake, flood plane, pedeplain and deltas. Types of rivers. Groundwater**:** Storage of ground water - porosity, permeability, aquifer, water table, zone ofsaturation, artesian well, springs, geysers, sinkhole, cavern, Stalactities and stalagmites. Glaciers: Definition of a glacier - types of glaciers - development of typical land forms byglacial erosion and deposition – cirque, U- shaped valley, Rocks-monadnocks. Morains,drumline, kames, eskors. Characteristic features of glaciated regions

Seas: offshore profile - land forms of sea - marine deposits and coral reefs. Lacustrinedeposits. Global climatic changes.Wind: Development of characteristic features by wind.Wind erosion and deposition, pedestal rock - mushroom topography - Incelberg - Ventifactssanddunes.

Earthquakes: Cause, kinds of earthquake waves, and mode of propagation, intensity ofearthquakes, Ritchers scale - seismograph and seismogram. Effects of earthquakes – Interiorof the earth based on seismictheory.
Volcanoes: origin, products of Volcanoes.
Continental Drift & Plate tectonics: Theory of Plate tectonics – nature and origin of oceanfloor.

Definition of a crystal - amorphous and crystalline states. Morphology of Crystals - face,edge, solid angle, interfacial angle.Forms: Simple, combination, closed and openforms.Symmetry: Plane, axis, center. Crystallographic axes. Parameters,indices;crystallographic notation - parameter system of Weiss, index system of Miller.Classificationof crystals into systems.
Morphological study of the following classes of symmetry
I. Cubic system – Galena type
II. Tetragonal system - Zircon type

Unit-V (12 hrs)

Morphological study of the following classes of symmetry
III. Hexagonal system - Beryl type
IV. Trigonal system - Calcite type.
V. Orthorhombic system - Barites type
VI. Monoclinic system - Gypsum type -
VII. Triclinic system - Axinite type

Definition of a mineral - classification of minerals into rock forming and ore forming minerals. Physical properties of minerals - Colour, streak, transparency, lustre, form, hardness, tenacity, cleavage, fracture and specific gravity. Silicate structures- isomorphism, solid solution, polymorphism, allotropy,Pseudomorphism and radioactivity. Study of physicalproperties, chemical properties and mode of occurrence of the following mineral groups:Olivine, Garnet and Aluminum silicates.

Study of physical properties, chemical properties and mode of occurrence of the following mineral groups: Pyroxenes, Amphiboles and Mica - Quartz and its varieties, Feldspars, and feldspathoids Miscellaneous: Staurolite, Tourmaline, Zircon, Calcite, Corundum and Apatite.

General Principles of optics, Refraction, Reflection Snell's law, Critical angle, total reflection.Isotropic and anisotropic minerals.Polarised light, refractive index, double refraction, uniaxial and biaxial minerals – Nicolprism and its construction.

Petrological microscope (Polarising) - its mechanical and optical parts – optical properties ofMinerals - extinction, pleochroism and interference colours.Optical Properties of importantminerals

SECTION –B (Marks-30)

Nature and scope of petrology - definition of rock,classification of rocks into igneous, sedimentary and metamorphic. Distinguishfeatures of three types of rocks. Forms -Lava flows, Instrusions, sills, laccolith, lopolith, dykes, ring dykes - vesicular, amygdaloidal, block lava, ropy lava, pillow, flow, and sheet structures. Columnar andprismatic structures

Textures - Definition of texture, micro-structure, devitrification- Hypidiomorphic, pandiomorphic, porphyritic, poikilitic, ophitic, intergrartular, intersertal, trachytic, graphicand micro-graphic textures. Classification of igneous rocks - CIPW and Tyrrelltabularclassification.

Descriptive study of the following rock types: Granite, Syenite, Diorite, Pegmatite, Gabbro, Pyroxenite, Dunite, Dolerite, Rhyolite, Trachyte and Basalt

Composition and constitution of magma - Crystallisation of magma -Unicomponent, binarysystem, eutectic and solid solutions. Origin of igneous rocks - Bowen's reaction principle, differentiation and assimilation ofmagma.

Sources of sediments - mechanical and chemical weathering, modes of transportation, stratification. Sedimentary structures - Types of bedding, surface marks, deformed bedding**,**solution structures.

Classification of sedimentary rocks; clastic - rudaceous, arenaceous, argillaceous, non-clastic--calcareous, carbonaceous, evaporities.Descriptive study of the following sedimentary rocks - conglomerate, Breccia, Sandstone,Gritt, Arkose, Shale and limestone.

Metamorphism - agents of metamorphism, types of metamorphism, grades and zones of metamorphism. Structures of metamorphic rocks - Cataclastic, maculosc, schistose, granulose and gneissose.Textures of metamorphic rocks- crystalloblastic, xenoblastic.

Classification of metamorphic rocks Cataclastic metamorphism of argillaceous and arenaceous rocks. Thermal metamorphism ofargillaceous,arenaceous and calcareous rocks.Dynamothermal metamorphism of argillaceous, arenaceous and igneous rocks.Descriptive study of the following metamorphic rocks - Gneiss, schist, slate, phyllite,quartzite, marble, Charmockite and khondalite.

Definition of structural geology - aim and objectives of the structural Geology; importance ofstudy of structures - primary and secondary structures; outcrop, attitude of beds – strike anddip.Use of clinometer and Brunton compass.Folds -description, nomenclature of folds-Geometrical and genetic classification. Recognition of folds in the field.

Joints-Classification of Joints- geometrical and genetic classification. Faults – geometrical and genetic classification of faults, recognition of faults in the field.

Unconformities- types of unconformities. Recognition of unconformities in the field. Distinguishing the faults from unconformities. Definitions of overlap, outlier, cleavage, schistosity, foliation and lineation

SECTION-C (Marks - 40)

Stratigraphy - Principals of stratigraphy. Lithosratigraphy and bio stratigraphy. Standardgeological time scale, Physiographic divisions of India. Brief study of type area, distribution in India, lithology, fossil content and economic importance of the following systems- Dharwar system, Cuddapah system, Vindhyan system,Kurnool system.

Gondwana system, Triassic of Spiti, Jurassic of Kutch, Cretaceous of Trichinopoly, DeccanTraps and their Age, Siwaliks with vertebrate fossils. (Brief study of type area, distribution inIndia, Lithology, fossil content and economic importance of the systems)

Definition of Palaeontology, Branches of Palaeontology, conditions of fossilization, modes ofpreservation and uses of fossils. Index and zone Fossils. Detailed study of morphology,classification and geological distribution of Corals and Brachiopoda. Fossils:Calceola, Zaphranthis,Terebratula, Spirifer, Rhynchonella, and Productos,

Detailed study of morphology, classification and geological distribution of Gastropods,Cephalopoda and Lamellibranchia;
Fossils: Turritella, Natica, Physa, Conus, Pecten. Gyphaea.Arca,Cardita, Nautilus. Ammonoids, Ceratites, Bellemnites.

Detailed study of morphology, classification and geological distribution of Trilobita, Echinodermata, Graptolites and Plant fossils. Fossils: Calymene, Paradoxide, Cidaris,Micraster, Hemiaster, Monograptus, Diplograptus, Glossopteris, Gangamopteris,Ptylophyllum and Lepidodendron.

Definition of Economic geology, mineral resources and mineral deposits, importance ofeconomic minerals and rocks, definition of ore - ore minerals, gangue minerals and industrialminerals. Classification of mineral deposits - Bateman's classification modified byJensen.Processes of formation of mineral deposits –magmatic concentration, metasomatism,hydrothermal,residual,

Mechanical concentration, supergene enrichment, sublimation and evaporation, Study of ore deposits of gold, copper, lead, zinc and aluminium, with respect to their mineralogy, uses, mode of occurrence, origin and distribution in India.Iron, manganese, chromium, , uses,mode of occurrence, origin and distribution in India.

Distribution of industrial minerals in India for the following industries – Refractories, fertilisers, Abrasives, cement,glass and Ceramic.Fossil fuels: Occurrence, origin and distribution of Coal and petroleum deposits.

Atomic minerals - uranium and thorium with respect to their mineralogy Uranite, Pitchblende, Beach sands -Monozite, Ilmenite, Rutile and Zirconand their use.Mineral resources of Andhra Pradesh.