



**Pt. Ravishankar Shukla University,
Raipur (C.G.), India 492010**

CURRICULUM & Syllabus

M.Sc. (Geology) Entrance Test

Session: 2025-26

Approved by:
Board of Studies

SoS in Geology & WRM

Dates :

DR. NINAD BODHANKAR 15-05-2025

Name of Chairman :

DR. NINAD BODHANKAR

Name of Member's :

Dr. K. R. Hari

Ninad

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School of Studies in Geology & WRM

Pt. Ravishankar Shukla University, Raipur, C.G

Syllabus for MSc (Geology) Entrance Test

Year of Examination 2025 – 26

Geodynamics & Geomorphology

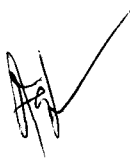
Introduction to Geology: Introduction to Geology and its branches and importance, Origin of Earth, Internal structure of Earth, Crust, Mantle and Core. **Age of Earth:** Various methods of determination of age of the Earth. **Dynamic Earth:** Theories of continental-drift, Sea-floor spreading and evidences, Concept of Plate Tectonics, Tectonic Plates: types, and plate boundaries, Introduction to paleomagnetism and polar wandering, Mid-oceanic ridges, trenches and island arcs. **Earthquakes:** Causes and effects, Earthquake Belts, measurement of earthquakes. Seismic zones of India, **Volcanoes:** Types & distribution, **Geomorphology:** Geomorphical agents and processes of rock weathering, Soil formation, soil profile and types of soil. Geological work of rivers ; fluvial landforms, Drainage system, Geological work of ground water and karst topography, Geological work of wind ; Aeolian landforms, Geological work of Glaciers ; glacial land forms. Geological work of oceans; coastal landforms, Volcanic landforms, Earth's heat budget, Climate change, global warming, greenhouse effect, Physiographic and tectonic divisions of India.

Mineralogy and Crystallography

Introduction to Crystallography: Definition of Mineral and Crystal: Rock forming and ore minerals, Crystal structures, Unit cells, Elements of crystal. Crystal forms, Crystallographic axes and axial angles, Weiss's Parameters and Miller's Indices systems of crystal notations. **Crystallography:** Interfacial angle and its measurement, Laws of Crystallography, **Crystal symmetry:** Plane, axis and center of symmetry, Classification of crystals into systems and classes, Symmetry and forms of normal classes, Twinning in crystals. **Mineralogy:** Silicate structures and classification of silicates, Bonding in Minerals, Isomorphism and Solid solution, Polymorphism and Pseudomorphism, Physical properties of minerals. **Optical Mineralogy:** Nature of light, reflection and refraction of light, Refractive index, Critical angle. Total internal reflection and Becke effect, Double refraction. Nicol prism - it's construction and working, Polarizing Microscope- its parts & functions, Optical properties of minerals. **Minerals and lithosphere:** Study of Composition, Classification, physical and optical properties of the following Mineral groups - Olivine, Garnet and Mica groups, Pyroxenes and Amphiboles, Feldspars and Feldspathoids, Silica, Composition of lithosphere, Industrial and other uses of various minerals.

Petrology

Igneous Petrology: Magma: definition, origin & composition, Bowen's reaction series, magmatic differentiation & assimilation, Introduction to crystallisation of Uni-component (silica), Bicomponent (albite-anorthite and diopside-anorthite) and tricomponent magma (diopside-albite-anorthite), Texture, structures & forms of igneous rocks, **Classification of igneous rocks:** Mineralogical, Chemical & Tabular classification. Brief idea of the formation of igneous rocks in relation to Plate Tectonics. Petrology of Acid igneous rocks, Alkaline igneous rocks, Basic igneous rock, Ultrabasic igneous rocks.



Sedimentary petrology: Origin, transportation & deposition of sediments, Sedimentary depositional environments - Aeolian, fluvial, coastal and abyssal environment, Introduction to sedimentary facies. Lithification & Diagenesis, Textures & structures of sedimentary rocks, Brief idea of the formation of sedimentary rocks in relation to Plate Tectonics. **Classification of sedimentary rocks:** Clastic, non-clastic and biogenic rocks, Petrographic description of Breccia, Conglomerate, sandstone, shale, siltstone and limestone. **Metamorphic Petrology:** Definition, agents, facies & grades, Textures, structures & classification of metamorphic rocks, Phase rule in metamorphism. Elementary idea about Paragenetic diagrams & projective analysis. A.C.F & A.K.F. diagrams, Progressive metamorphism of Argillaceous rocks and thermal metamorphism of impure limestone, Progressive metamorphism of basic igneous rocks, Petrographic description of slate, phyllite, schist, gneiss, marble, quartzite, amphibolite, Khondalite, Gondite, Kodurite & Charnockite, Introduction to Paired Metamorphic Belts.

Structural Geology

Dip and Strike: definition & measurement. Rule of 'Vs', Clinometer and Brunton compass, **Unconformity:** Definition & types, Outlier and inlier. Overlap & offlap. Recognition of unconformity. **Fold:** Definition and morphology, Geometric and genetic classification of folds, Recognition of folds in the field and on geological maps, Effect of folds on outcrops, Mechanics of folding. **Fault:** Definition and morphology, Geometric and genetic classification of faults, Recognition of faults in the field and on geological maps, Effect of faults on outcrops, Mechanics of faulting. **Joint, Foliation & Lineation:** Definition, geometric & genetic classification of joints. **Foliation:** terminology, kinds, origin and relation to major structures, **Lineation:** terminology, Kinds, origin and relation to major structures, **Plutons:** tectonics & emplacement. Tectonic framework of India.

Palaeontology

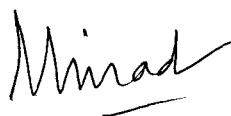
Modes of fossilization. Uses of fossils, Derived fossils, Index fossils & their significance, Use of Palaeontology in Stratigraphy, Palaeoecology & Palaeogeography, Gondwana plant fossils. Morphology, Geological distribution and important species of Foraminifera & Anthozoa fossils, Gastropoda and Lamellibranchia fossils, Cephalopoda, Echinoidea & Brachiopoda fossils, Trilobite and Graptolite fossils.

Stratigraphy

Principles of Stratigraphy, Various divisions of Geological Time Scale, their nomenclature and type area. Basic concepts of Lithostratigraphic, Chronostratigraphic & Biostratigraphic Units. Tectonic & Physical Subdivisions of Indian subcontinent. **Geological distribution, stratigraphic classification and economic importance of:** Archaeozoic rocks of India, Archaeozoic rocks of Bastar (Chhattisgarh), Vindhyan & Chhattisgarh supergroup of rocks, Gondwana Supergroup, Deccan-traps, inter trappean and infra trappean (Bagh & Lameta) Beds, Palaeozoic rocks of Salt Range, Palaeozoic rocks of Spiti Valley, Cretaceous rocks of Trichonopoly, Jurassic rocks of Kutchh-Region, Tertiary rocks of Assam-Region, and Siwalik group of rocks.

Earth Resources & Applied Geology

Processes of mineral deposit formation: Concept of distribution of mineral deposits in time & space in Indian context. Classification of mineral deposits. **Igneous processes of mineralization:** (a) Magmatic process and its Indian examples. (b) Hydrothermal processes and its Indian examples, **Sedimentary**



processes of mineral formation: (a) Mechanical and residual concentration (b) Precipitation (c) Evaporites, Oxidation & supergene sulphide enrichment processes. **Metallic and non-metallic mineral deposits:** Geological, Geographical distribution, mode of occurrence, mineralogy & economic importance of following metallic & nonmetallic deposits of India, Iron, Manganese, Chromium, Copper, Lead, Zinc, Gold, Aluminium, Refractory and Fertilizer minerals, Minerals used in cement & chemical industries. **Economic Geology:** Ore, ore mineral, gangue mineral, tenor, grade, assay. **Coal deposit:** Origin, & stratigraphy. **Types of coal:** Peat, Lignite, Bituminous & Anthracite. Coal deposits of Chhattisgarh. **Oil reserves:** Origin of Natural-hydrocarbon, its migration & accumulation. **Types of oil traps:** Structural, stratigraphic and composite. Offshore & onshore oil fields of India, **Radioactive minerals:** Mineralogy, Geological & Geographical distribution in India.

Applied Geology

Engineering properties of rocks, Geological consideration for site selection of Dam and Tunnels, Elementary study of Photogeology and use of Aerial photographs in geological studies, Hydrologic cycle. Mode of occurrence of ground water, Hydrologic properties of rocks. Porosity and permeability. Brief idea about aquifer, aquiclude, aquitard and aquifuge. Introduction to mineral exploration. Principles and instruments of Gravity and Electrical methods of geophysical exploration, Principles and instruments of Magnetic and Seismic methods of geophysical exploration, Elementary idea about Remote Sensing & GIS and its applications.

