

**SCHEME & SYLLABUS OF EXAMINATION FOR THE PURPOSE OF FILLING UP THE POST OF ASSISTANT GEOLOGIST UNDER MINES, MINERAL & GEOLOGY DEPARTMENT.**

The examination will be consist of two (2) papers:-

PAPERS	SUBJECT	FULL MARKS	TIME ALLOWED
PAPER-I	GENERAL ENGLISH & GENERAL KNOWLEDGE	100 (MCQ & Conventional)	2.00 HOURS
PAPER-II	GEOLOGY	300 (MCQ & Conventional)	3.00 HOURS

**VIVA-VOCE/PERSONALITY - 40**

**PAPER-I: GENERAL ENGLISH:-**

The question will be designed to test the candidate's understanding and command of the English language.

**ENGLISH**

Candidates will be required to answer questions designed to test their understanding of English and workman like use of words. The pattern of questions would be broadly as follows:-

1. Comprehension of given passage.
2. Precis writing.
3. Usages and Vocabulary
4. Essay.

**GENERAL KNOWLEDGE**

**General Knowledge:** Knowledge of current events of local, National and International importance and of such matter of everyday observation and experience in their scientific aspects as may be expected of any educated person who has not made a special study of any scientific subject. The paper will also include questions of Modern history (from 1857 onwards) of India, Indian Culture, Indian policy, Indian economy, and Geography of India of such nature as candidates should be able to answer without Special Study and questions on the teachings of Mahatma Gandhi. The questions will be objective type.

**Syllabus for the post of Assistant Geologist**

**Paper 2 - Part I**

**1. General Geology:**

The Solar System, meteorites, origin and interior of the earth and age of earth; Volcanoes—causes and products, Volcanic belts. Earthquakes—causes, effects, seismic of zone of India; Island arcs, trenches and mid-ocean ridges; Continental drift; Seafloor spreading, plate tectonics. Isostasy.

**2. Geomorphology and Remote Sensing :** Basic concepts of geomorphology. Weathering and soil formations; Landforms, slopes and drainage. Geomorphic cycles and their interpretation. Morphology and its relation to structures and lithology; Coastal geomorphology; Applications of geomorphology in mineral prospecting, civil engineering; hydrology and environmental studies; Geomorphology of Indian sub-continent. Aerial photographs and their interpretation—merits and limitations; The Electromagnetic spectrum. Orbiting Satellites and Sensor Systems. Indian Remote Sensing Satellites. Satellite data products; Applications of remote sensing in geology; The Geographic Information System (GIS) and Global Positioning System (GPS)—its applications.

Principles of geologic mapping and map reading projection diagrams, Stress and strain ellipsoid and stress strain relationships of elastic, plastic and viscous materials; Strain markers in deformed rocks. Behaviour of minerals and rocks under deformation conditions. Folds and faults classification and mechanics; Structural analysis of folds, foliations, lineations, joints and faults, unconformities; Time relationship between crystallization and deformation.

**4. Paleontology :**

Species—definition and nomenclature; Megafossils and Microfossils. Modes of preservation of fossils; Different kinds of microfossils; Application of microfossils in correlation, petroleum exploration, paleoclimatic and paleoceanographic studies; Evolutionary trend in Hominidae, Equidae and Proboscidae. Siwalik fauna. Gondwana flora and fauna and its importance; Index fossils and their significance.

**5. Indian Stratigraphy:** Classification of stratigraphic sequences: lithostratigraphic, biostratigraphic, chrono-stratigraphic and magnetostratigraphic and their interrelationships; Distribution and classification of Precambrian rocks of India; Study of stratigraphic distribution and lithology of Phanerozoic rocks of India with reference to fauna, flora and economic importance. Major boundary problems--Cambrian/ Precambrian, Permian/Triassic, Cretaceous/Tertiary and Pliocene/Pleistocene; Study of climatic conditions, paleogeography and igneous activity in the Indian subcontinent in the geological past. Tectonic framework of India. Evolution of the Himalayas.

**6. Hydrogeology:**

Hydrologic cycle and genetic classification of water; Movement of subsurface water; Springs; Porosity, permeability, hydraulic conductivity, transmissivity and storage coefficient, classification of aquifers; Water-bearing characteristics of rocks; Groundwater chemistry. Salt water intrusion. Types of wells. Drainage basin morphometry; Exploration for groundwater; Groundwater recharge; Problems and management of groundwater; Rainwater harvesting.

**7. Engineering Geology**

Geological investigations for dams, tunnels highways, railway and bridges; Rock as construction material; Landslides causes, prevention and rehabilitation; Earthquake-resistant structures. Engineering properties of rocks; Mechanical principles and properties of rocks and their controlling factors, theory of rock failure. Introduction to soil mechanics, formation of soils, soil types, soil classification, compression and consolidation, shear strength of soils.

**8. Geophysical Exploration**

Resistivity methods  
Seismic methods

**Paper 2 – Part II**

**1. Mineralogy :**

Physical and chemical characters of rock forming silicate mineral groups; Structural classification of silicates; Common minerals of igneous and metamorphic rocks; Minerals of the carbonate, phosphate, sulphide and halide groups; Clay minerals.

**2. Igneous and Metamorphic Petrology:**

Generation and crystallisation of magmas. Crystallisation of albite—anorthite, diopside— anorthite and diopsidewollastonite— silica systems. Bowen's Reaction Principle; Magmatic differentiation and assimilation. Petrogenetic significance of the textures and structures of igneous rocks. Petrography and petrogenesis of granite, syenite, diorite, basic and ultrabasic groups, charnockite, anorthosite and alkaline rocks. Carbonatites. Deccan volcanic province. Types and agents of metamorphism. Metamorphic grades and zones; Phase rule. Facies of regional and contact metamorphism; ACF and A KF diagrams; Textures and structures of metamorphic rocks. Metamorphism of arenaceous, argillaceous and basic rocks; Minerals assemblages. Retrograde metamorphism; Metasomatism and granitisation, migmatites. Granulite terrains of India.

**3. Sedimentary Petrology :**

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Sedimentary and Sedimentary rocks: Processes of formation; diagenesis and lithification; Clastic and non-clastic rocks-their classification, petrography and depositional environment; Sedimentary facies and provenance. Sedimentary structures and their significance. Heavy minerals and their significance. Sedimentary basins of India.

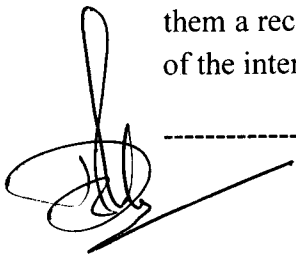
### **4. Economic Geology :**

Ore, ore mineral and gangue, tenor of ore. Classification of ore deposits; Processes of formation of mineral deposits; Controls of ore localisation; Ore textures and structures; Metallogenic epochs and provinces; Geology of the important Indian deposits of aluminium, chromium, copper, gold, iron, lead, zinc, manganese, titanium, uranium and thorium and industrial minerals; Deposits of coal and petroleum in India, National Mineral Policy; Conservation and utilization of mineral resources. Marine mineral resources and Law of Sea.

### **6. Geochemistry and Environmental Geology :**

Cosmic abundance of elements. Composition of the planets and meteorites. Structure and composition of earth and distribution of elements. Trace elements. Elements of crystal chemistry-types of chemical bonds, coordination number. Isomorphism and polymorphism. Elementary thermodynamics. Natural hazards—floods, mass wasting, coastal hazards, earthquakes and volcanic activity and mitigation; Environmental impact of urbanization, mining, industrial and radioactive waste disposal, use of fertilizers, dumping of mine waste and fly-ash. Pollution of ground and surface water, marine pollution. Environment protection—legislative measures in India; Sea level changes: causes and impact.

**VIVA-VOCE:** The candidates will be interviewed by the Commission who will have before them a record of his career. He will be asked questions on matters of general interest. The object of the interview is to assess the personality suitability of the candidate for the service post.



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APPENDIX-II

CONDITIONS OF ELIGIBILITY FOR APPEARING IN THE EXAMINATION:

In order to be eligible to appear in the Competitive Examination, a candidate must satisfy the following conditions, namely:-

- (1) **Minimum educational qualification**      Master Degree in Geology from a recognized University.
  
- (2) **Age**      Age between 21 to 40 years for all communities of the State as per Notification No: M(3)/(55)/GEN/DOP/Pt-III, Dated: 03/07/2017.
  
- (3) **Other qualification**
  - (i) Candidates should be in a possession of CoI/SSC.
  - (ii) Should be conversant with the customs and usages of Sikkim.
  - (iii) Should have knowledge of any of the recognized State languages
  - (iv) Should have local Employment Card.



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