The examination will comprise of the following papers:

(1) General English Paper - I : 100 Marks
(2) General English Paper - II : 100 Marks
(3) Geology Paper - I : 200 Marks
(4) Geology Paper - II : 200 Marks
(5) Geology Paper - III : 200 Marks

Total : 800 Marks

DETAILS OF SYLLABUS :

(1) General English Paper - I
ESSAY TYPE : 100 Marks

(a) Essay Writing : 25 Marks
(b) Précis Writing : 15 Marks
(c) Letter Writing : 15 Marks
(d) Idioms & Phrases : 14 Marks
(e) Expansion of passages : 15 Marks
(f) Comprehension of given passages : 16 Marks

(2) General English Paper – II
MCQ/OBJECTIVE TYPE: 100 Marks

(a) Grammar : Parts of Speech, Nouns, Adjective, Verb, Adverb, Preposition, Etc. : 40 Marks
(b) Compositions : 30 Marks
   i) Analysis of complex and compound sentences.
   ii) Transformation of sentences.
   iii) Synthesis of sentences.
(d) Correct usage and vocabularies. : 30 Marks
Section - A: Geomorphology and Remote Sensing. (40 Marks)

Introduction: Development, Scope, Geomorphic concepts, Types and Tools; Landforms: Role of Lithology, peneplanation, endogenous and exogenous forces responsible, climatic and Tectonic factors and rejuvenation of landforms; Denudational processes: Weathering, erosion, transportation, weathering products and soils – profiles, types, duricrusts; Hillslopes: Their characteristics and development, fluvial processes on hillslopes; River and drainage basin: Drainage pattern, network characteristics, Valleys and their development, processes of river erosion, transportation and deposition; Landforms produced by geomorphic agents: Fluvial, Coastal, Glacial and Aeolian landforms; Geomorphic indicators of neotectonic movements: Stream channel morphology changes, drainage modifications, fault reactivation, Uplift – subsidence pattern in coastal areas; Applied Geomorphology: Application in various fields of earth sciences viz. Mineral prospecting, Geohydrology, Civil Engineering and Environmental studies; Geomorphology of India: Geomorphical features and zones Electromagnetic radiation – characteristics, remote sensing regions and bands; General orbital and sensor characteristics of remote sensing satellites; Spectra of common natural objects – soil, rock, water and vegetation. Aerial photos – types, scale, resolution, properties of aerial photos, stereoscopic parallax, relief displacement; Principles of photogrammetry; Digital image processing - characteristics of remote sensing data, preprocessing, enhancements, classification; Elements of photo and imagery pattern and interpretation, application in Geology; Remote sensing applications in interpreting structure and tectonics, Lithological mapping, mineral resources, natural hazards and disaster mitigation, groundwater potentials and environmental monitoring. Landsat, Skylab, Seasat and other foreign systems of satellites and their interpretation for geological and other studies; Space research in India – Bhaskara and IRS systems and their applications, Thermal IR remote sensing and its applications, Microwave remote sensing and its applications. Principles and components of Geographic Information System (GIS), remote sensing data integration with GIS, applications of GIS in various geological studies.

Section - B: Structural Geology (40 Marks)

Section - C: Geodynamics (40 Marks)


Section - D: Stratigraphy (40 Marks):


Section - E : Paleontology (40 Marks)

Evolution of the fossil record and the geological time scale. Rocks record, palaeoclimates and palaeogeography. Species concept; Major evolutionary theories ; Techniques in Palaeontology mega fossils- microfossils – nannofossils , ichnofossils – collection, identification and illustration – binomial Nomenclature; Invertebrate Palaeontology – A brief study of morphology, classification, evolutionary trends and distribution of Bivalves, cephalopoda and Gastropods, Echinoids, Corals and Brachiopods. Vertebrate Palaeontology – Brief study of vertebrate life through ages. Evolution of reptiles and mammals; Siwalik vertebrate fauna; Biodiversity and mass extinction events; evidence of life in Precambrian times; Palaeontological perspective : Use of palaeontological data in a) Stratigraphy b) Palaeoecology and evolution; Introduction to Micropalaeontology; Types of Microfossils; Plant fossils: Gondwana flora and their significance. Different microfossil groups and their distribution in India; Application of palynology.
Section - A: Mineralogy and Geochemistry (40 Marks):

Section - B: Igneous Petrology (40 Marks)
Section - C: Metamorphic Petrology (40 Marks):
Concept of Metamorphism. Types of Metamorphism and their controlling factors; Classification of metamorphic rocks; Concept of metamorphic zones and grades. Metamorphic facies and facies series. Prograde and retrograde metamorphism, Structures and textures of metamorphic rocks.
Phase diagram and graphic representation of mineral assemblages ACF, AKF &AFM. Metamorphic reactions. Experimental thermodynamic appraisal of metamorphic reactions, geothermo-barometry. Regional and thermal metamorphism of pelitic rock, basic and ultrabasic rocks; impure silicious carbonate rocks. Charnockites and Migmatites. Metamorphism in space and time; plate tectonics and metamorphic processes, paired metamorphic belts; Archaean and Proterozoic terrains.

Section - D: Sedimentology (40 Marks):

Section - E: Environmental Geology and Natural Hazards (40 Marks)
Section A: Indian mineral deposits and Ore genesis (30 Marks):

Section B: Geophysics (30 Marks):
Interrelationship between geology and geophysics - Role of geological and geophysical data in explaining geodynamical features of the earth. General and Exploration geophysics - Different types of geophysical methods; Gravity, magnetic, Electrical, Seismic - their principles and applications. Geophysical field operations - Different types of surveys, grid and route surveys, profiling and sounding techniques, scales of survey, presentation of geophysical data. Application of Geophysical methods - Regional geophysics, ore geophysics, engineering geophysics. Geophysical anomalies : correction to measured quantities, geophysical, anomaly, regional and residual (local) anomalies, factors controlling anomaly, depth of exploration. Integrated geophysical methods - Ambiguities in geophysical interpretation, Planning and execution of geophysical surveys.

Section C: Mineral exploration (30 Marks)
Resource, reserve definitions; mineral resource in industries - historical perspective and present. A brief overview of classification of mineral deposits with respect to processes of formation in relation to exploration strategies. Principles of mineral prospecting and exploration - conceptualization, methodology and stages; sampling, subsurface sampling including pitting, trenching and drilling, core and non-core drilling, planning of bore holes and location of bore holes on ground. Core logging, geochemical exploration- nature of samples anomaly, strength of anomaly and controlling factors, coefficient of aqueous migration. Principles of reverse estimation, density and bulk density, factors affecting reliability of reserve estimation, reserve estimation based on geometrical models (square, rectangular, triangular and polygon blocks) regular and irregular grid patterns, statistics and error estimation. Application of Geophysical
techniques, Geomorphological and remote sensing techniques and Geobotanical and geochemical methods. Application of geostatistical techniques in Mineral Exploration.

**Section D: Geology of fuels (30 Marks)**


**Section E: Engineering Geology (30 Marks)**


**Section E: Aptitude Test (50 Marks)**

(a) Numerical and Figure work Tests : (16 Marks)

These tests are reflections of fluency with numbers and calculations. It shows how easily a person can think with numbers. The subject will be given a series of numbers. His/Her task is to see how the numbers go together to form a relationship with each other. He/She has to choose a number which would go next in the series.

(b) Verbal Analysis And Vocabulary Tests : (14 Marks)

These tests measure the degree of comfort and fluency with the English language. These tests will measure how a person will reason with words. The subject will be given questions with alternative answers, that will reflect his/her command of the rule and use of English language.
(c) Visual And Spatial/3-D Ability Tests : (10 Marks)
These tests are used to measure perceptual speed and acuity. The subject will be shown pictures where he/she is asked to identify the odd one out; or which comes next in the sequence or explores how easily he/she can see and turn around objects in space.

(d) Abstract Reasoning Tests : (10 Marks)
This test measures the ability to analyse information and solve problems on a complex, thought based level. It measures a person’s ability to quickly identify patterns, logical rules and trends in new data, integrate this information, and apply it to solve problems.

******