GROUP-37

Mining Officer (Level of Exam- B.Sc. Geology)

1) General awareness, Reasoning, Mathematics, Science, History including Haryana related history, current affairs, literature, Geography, Civics, Environment, Culture etc. - (**Weightage 20%)**

2) Computer terminology, Fundamentals, word software, excel software, Power point, internet, web browsing, Communication, emails, downloading and uploading data on websites etc**. -**

(Weightage 10%)

3) Subject related syllabus- (Weightage 70%)

EARTH SYSTEM SCIENCE

Earth as a planet, Earth's magnetic field,Plate Tectonics,Hydrosphere and Atmosphere,Soil, Understanding the past from stratigraphic records, Cosmic abundance of elements.

MINERAL SCIENCE

Crystallography, Crystal symmetry and projections, Rock forming minerals,Properties of light and optical microscopy.

ELEMENTS OF GEOCHEMISTRY

Concepts of geochemistry, Introduction to properties of elements,Layered structure of Earth and geochemistry, Element transport, Geochemistry of solid Earth, Geochemical behaviour of selected elements like Si, Al, K, Na etc.

STRUCTURAL GEOLOGY

Structure and Topography, Stress and strain in rocks: Concept of rock deformation, Folds, Introduction to the mechanics of folding, Foliation and lineation, Fractures and faults.

IGNEOUS PETROLOGY

Concepts of Igneous petrology, Introduction to petrology, Forms, Phase diagrams and petrogenesis, Magmatism in different tectonic settings, Petrogenesis of Igneous rocks.

SEDIMENTARY PETROLOGY

Origin of sediments, Sediment granulometry, Primary Sedimentary structures and environments of sedimentation, Modes of sedimentary transport, heavy minerals, Paleocurrent analysis, Varieties of sedimentary rocks, Carbonate rocks, Lithification & Diagenesis.

PALEONTOLOGY

Fossilization and fossil record, Taxonomy and Species concept, Invertebrates, Vertebrates, Introduction to Palaeobotany, Gondwana Flora, Application of fossils in Stratigraphy.

METAMORPHIC PETROLOGY

Metamorphism: controls and types, Metamorphic facies and grades, Metamorphism and Tectonism, Migmatites and their origin, Metamorphic rock associations.

HYDROGEOLOGY

Introduction and basic concepts, Groundwater flow, well hydraulics and Groundwater exploration, Groundwater chemistry, Groundwater management, Rainwater harvesting and artificial recharge of groundwater.

ECONOMIC GEOLOGY

Ores and gangues, Mineral deposits and Classical concepts of Ore formation, Mineral exploration, Structure and texture of ore deposits, Ore grade and Reserve, assessment of grade, reserve estimation, Metallic and Non-metallic ore deposits of India.

GEOMORPHOLOGY

Introduction to Geomorphology, Endogenic and Exogenic processes, Geoid, Topography, Hypsometry, Major Morphological features, Overview of Indian Geomorphology, Landforms produced by wind, glaciers and rivers.

ENGINEERING GEOLOGY

Role of Engineering geologists in planning, design and construction of major man-made structural features,Site investigation and characterization, Foundation treatment, Intact Rock and Rock Mass properties, Concept, Mechanism and Significance of Rock Quality Designation (RQD) Concept, Mechanism and Significance of: a. Rock Structure Rating (RSR) b. Rock Mass Rating (RMR) c. Tunnelling Quality Index (Q) Geological, Geotechnical and Environmental considerations for Dams and Reservoirs, Tunnels and Tunnelling Methods, Landslides, Earthquakes.

REMOTE SENSING AND GIS

Photogeology, Remote Sensing, Concepts in Remote Sensing, IRS series imagery, GIS, Datum, Coordinate systems and Projection systems Spatial data models, Introduction to DEM analysis, GPS, Concepts of GPS Integrating GPS data with GIS Applications in earth system sciences.

EXPLORATION GEOLOGY

Mineral Resources, Prospecting and Exploration, Evaluation of data, Drilling and Logging, Reserve estimations and Errors.

EARTH AND CLIMATE

Climate system, Heat budget of Earth, Atmosphere – Hydrosphere, Response of biosphere to Earth’s climate, Orbital cyclicity and climate, Monsoon.

FUEL GEOLOGY

Coal, Coal as a fuel, Petroleum, Petroleum Reservoirs and Traps, Other fuels, Gas Hydrate, Nuclear Fuel.

RIVER SCIENCE

Stream hydrology, River basin, Drainage, Rivers in time and space, Paleochannels of the SarasvatiRiver in Haryana, Channels and Landscapes, Fluvial hazards.

INTRODUCTION TO GEOPHYSICS

Geology and Geophysics, General and Exploration geophysics, Geophysical field operations, Application of Geophysical methods, Geophysical anomalies, Integrated geophysical methods.

ESSENTIALS OF GEOLOGY

Introduction to geology, scope, sub-disciplines and relationship with other branches of sciences, Earth in the solar system, origin Earth’s size, shape, mass, density, rotational and evolutional parameters, Solar System- Introduction to Various planets - Terrestrial Planets Solar System- Introduction to Various planets - Jovian Planets Internal constitution of the earth - core, mantle and crust, Convections in the earth’s core and production of magnetic field Composition of earth in comparison to other bodies in the solar system, Origin and composition of hydrosphere and atmosphere Origin of biosphere Origin of oceans, continents and mountains, Age of the earth; Radioactivity and its application in determining the age of the Earth, rocks, minerals and fossils.

ROCKS AND MINERALS

Minerals-Definitions, Physical properties of minerals Mineralogical structure of earth, planetary minerals and native elements,Mineral structures Mineralogy of the Earth's crust, mantle and core, Nature of light and principles of optical mineralogy Optical classification of minerals. Rocks- Definitions and types, Basics of rock formation.

PHYSICS AND CHEMISTRY OF EARTH

Earth, Earth's interior, Elements of earth's magnetism, Elements: Origin of elements/nucleosynthesis. Abundance of the elements in the solar system / planet earth Geochemical classification of elements. Earth accretion and early differentiation Isotopes and their applications in understanding Earth processes.

EARTH RESOURCES

Earth Resources Resource reserve definitions; mineral, energy and water resources 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, Definition of Energy: Primary and Secondary Energy Difference between Energy, Power and Electricity Renewable and Non-Renewable Sources of Energy, Potential of Hydroelectric Power, Solar Energy, Wind, Wave and Biomass Based power and Energy, Ground water resources and its role in economic development of a country, Ground water resources of Haryana, Current Scenario and Future Prospects of Solar Power, Hydrogen Power and Fuel Cells, Mineral resources of Haryana.

NATURAL HAZARDS AND DISASTER MANAGEMENT

The Lithosphere and Related Hazards Atmospheric Hazards, Hydrosphere and Related Hazards, Concepts of disaster, Types of disaster: natural and manmade - cyclone, flood, land slide, land subsidence, fire and earthquake, tsunami and volcanic eruption, Meteorite Impacts Issues and concern for various causes of disasters Disaster management, mitigation, and preparedness Techniques of monitoring and design against the disasters Management issues related to disaster, Disaster Management in India Risk, Vulnerability and Hazard Mitigation through capacity building Legislative responsibilities of disaster management; disaster mapping, assessment Pre-disaster risk & vulnerability reduction Post disaster recovery & rehabilitation Disaster related infrastructure development, Hazard Zonation Mapping, Remote-sensing and GIS applications in real time disaster monitoring Prevention and rehabilitation, Earthquake Zones of India, Rainfall distribution; fresh and saline groundwater zones; water logged areas; flood and drought prone areas in Haryana.

Important Note: The Weightage as mentioned against the syllabus is tentative & may vary.