

RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER
SYLLABUS FOR COMPETITIVE EXAMINATION FOR THE POST
OF LECTURER IN GEOLOGY FOR COLLEGE EDUCATION
DEPARTMENT
PAPER-II

Unit I –

Stratigraphy and Palaeontology

Geological Time-scale; reasoning and equivalence of its divisions. International code of stratigraphic nomenclature. Principles and methods of stratigraphic correlation. Geochronology and Chronostratigraphy. Lithostratigraphy. Biostratigraphy. Quantitative stratigraphy. Magnetostratigraphy, Cyclostratigraphy, Pedostratigraphy, Seismic stratigraphy and Sequence stratigraphy.

Distribution, classification, lithology, structure and economic importance of Dharwar, Bastar, Singhbhum, Aravalli – Bundelkhand and Shillong cratons with special emphasis on Aravalli, Dharwar, Sausar – Sakoli, Delhi, Vindhyan, Cuddapah and Malani terranes.

Overview of Phanerozoic stratigraphy of India with special reference to Palaeozoic rocks of Kashmir, Mesozoic rocks of Spiti, Kachchh, western Rajasthan, central and southern India. Gondwana Supergroup and its significance. Tertiary rocks of western India and Himalayan region including Siwalik Supergroup.

Deccan Volcanic Province, its evolutions, extent, stratigraphy and age. K-T boundary and mass extinction. Overview of Quaternary geology of India with emphasis on the origin and evolution of Indo-Gangetic plains and Thar Desert.

Origin of life and Organic Evolution, concept of palaeoecology. Marine and terrestrial ecosystems. Mass extinctions.

Morphology, classification, palaeoecology and evolutionary trends of Corals, Echinoids, Lamellibranchs, Cephalopods, Gastropods, Brachiopods; Trilobites and Graptoloids.

Morphology, classification, palaeoecology and evolutionary trends of Foraminifers. Ostracods. Conodonts and Nanoplanktons. Vertebrates of Siwalik. Evolutionary histories of Man, Elephant and Horse. Gondwana flora and its significance. Palynology and its applications.

Unit II -

Mineral and Energy Resources

Principle ore mineral groups. Classification of ore forming processes. Mineral Resource and concept of ore genesis. Characteristics of Hydrothermal processes and deposits. Metasomatic replacement type of deposits. Magmatism and ore genesis. Economic mineral deposits of sedimentary association including iron, manganese and evaporate deposits. Residual concentration process and ore deposits. Mechanical concentration: Fluvial, Alluvial, Aeolian and Beach placers. Oxidation and Supergene Sulphide deposits. Economic deposits of Biogenic origin. Contemporary Ore forming systems: black smokers, Mn nodules.

Geological setting and genesis of important metallic (iron, manganese, chromium, lead, zinc, copper and aluminum), industrial (mica, feldspar, quartz, soapstone, clay, gypsum, limestone, calcite, wollastonite and abrasive), rock phosphate, and soda – potash deposits of India with special reference to Rajasthan.

Coal: Its classification and origin. Coal-bed methane and fundamentals of its exploration. Geological and geographical distribution of coal deposits in India. Lignite deposits of India: their geological setting, characteristics and origin.

Oil and gas deposits: their origin, nature and migration (primary and secondary), characteristics of reservoir rocks and traps (structural, stratigraphic and combination). Geology of Cambay Basin, Barmer – Jaisalmer Basin, Bombay High, Assam and Krishna – Godavari oil fields of India.

Mode of occurrence, geological setting and genesis of U and Th deposits of India.

Geological, geochemical and geophysical exploration methods for ferrous, non-ferrous metals and petroleum and coal deposits.

Unit III –

Hydrogeology, Environmental and Engineering Geology

Ground water: its occurrence and distribution; water table and its significance. Types of aquifer; geological formations as aquifers and their properties: porosity, permeability, specific yield, specific retention, hydraulic conductivity, transmissivity, storage coefficient. Steady, unsteady and radial flow conditions of water, Darcy's law and its application. Water table contour maps. Pumping test and its significance.

Physical and chemical properties of water, quality criteria for various uses, Groundwater pollution (natural and anthropogenic), problems of nitrate, arsenic and fluoride in water and remedial measures. Salt water intrusion in coastal aquifers and its prevention. Surface and subsurface geological and geophysical methods of groundwater exploration, hydrogeomorphic mapping using various remote sensing techniques. Isotopes in hydrogeological studies. Groundwater provinces of India with special reference to groundwater resources of Rajasthan

Water resources evaluation and management. Impact of industrialization and urbanization on surface and ground water quality. Water logging problems; causes and remedies.

Basic principles of Environmental Geology. Elementary idea about climate change through Earth's history. Cenozoic climate extremes - impact on human evolution. Ozone layer depletion, Carbon di-oxide in the atmosphere and sea water. Records of palaeotemperatures in ice cores. Greenhouse gases and global warming

Eco-friendly mining and concept of sustainable development. Environmental impact of mining, EIA (Environmental Impact Assessment) and EMP (Environmental Management Plan),

Engineering properties of rocks. Physical characteristics of building stones. Metal and concrete aggregates. Geological investigations for dams and reservoir sites. Dam foundation investigations, problems and remedies. Geotechnical considerations for tunnel construction and tunnel alignments; classification of ground for tunneling purposes; types of tunnel support. Mass movements with special emphasis on landslides. Hill slope instability. Seismic zones of India. Aseismic design of

buildings. Influence of geological factors on foundation and design of buildings.
Influence of Neotectonics in seismic hazard assessment.

Note :- **Pattern of Question Paper**

1. **Objective type paper**
2. **Maximum Marks : 75**
3. **Number of Questions : 150**
4. **Duration of Paper : Three Hours**
5. **All questions carry equal marks.**
6. **There will be Negative Marking.**