

**FURTHER DETAILS REGARDING MAIN TOPICS OF  
PROGRAMME NO. 11/2017/ONLINE (Item No.1 )**

**LECTURER IN GEOLOGY**

**COLLEGIATE EDUCATION**

**(CATEGORY NO. 476/16)**

**PART I**

**Module I**

Historical development, fundamental concepts and scope of Geomorphology-Different models of evolution of landscape. Geomorphic agents and processes-Fluvial Geomorphology- Morphometric analysis: elements and parameters. Coastal Geomorphology and hill slope processes. Geomorphology of Kerala Role of Geologists in environmental studies. Man & Environment - Natural and anthropogenic Environmental hazards/disasters and their management. Changing concepts of waste and their disposal. Atmospheric, terrestrial and marine pollution. Weathering – Type, Processes and products, Factors of soil formation – Soil profile.

**Module II**

Concept of symmetry in crystals. Important crystal systems in crystallography. Principles of X-Ray crystallography. Definition of mineral, megascopic identification of minerals. Isomorphism and polymorphism, Important optical properties under open and crossed nicols - refractive index, birefringence, interference colours, dichroism and pleochroism. Uniaxial and biaxial minerals, and indicatrices. Conoscopic study of minerals, interference figures and optic sign and optic axial angle. Determination of pleochroic scheme. Geochemical distribution of elements- Geochemical cycle and classification. Principles and methods of isotope dating. Application of thermodynamics in Geochemistry.

**Module III**

Formation and evolution of magma- Bowen's Reaction Principle and Series, Phase Diagrams: Binary and Ternary Systems. Classification of igneous rocks – textures and structures. Petrography and petrogenesis of Kimberlites, Carbonatites, Anorthosites, Basalts, Alkaline Rocks, and Granites. Structures and textures of sedimentary rocks- classification of sedimentary rocks. Sandstones and limestones- Provenance studies. Statistical analysis of grain size parameters and their geological significance. Factors, concepts and kinetics of metamorphism-

metamorphic grades, zones and facies. Genetic significance of textures and structures of metamorphic rocks—Mineral parageneses—ACF & AKF diagrams. Petrography and petrogenesis of charnockites, gneisses, migmatites, eclogites, schists and amphibolites.

#### **Module IV**

Rock deformation: concept of stress and strain. Principles of geological mapping and map reading. Classification of folds and their recognition in the field. Faults: terminology and classification. Foliation and Lineation. Petrofabric analysis. Plate Tectonics, Continental drift, Polar wandering and Sea Floor Spreading. Historical development and principles of stratigraphy. Code of Stratigraphic Nomenclature and Modern stratigraphic classification. Major geological events during different periods of earth's history. Important Pre-Cambrian formations of India with special reference to Karnataka and Kerala- Cuddapah and Vindhyan Supergroup. Cretaceous rocks of Trichinopoly - Deccan Traps. Fossils and fossilization. Origin and evolution of life. Trends in the evolution of Brachiopoda, Cephalopoda, Trilobita and Graptozoa. Pre-Cambrian stromatolites, classification and morphology. Morphology and evolution of Fishes, Amphibians, Reptiles and Mammals. Micropalaeontology: Techniques in collection, separation and preparation. Palaeoecology and stratigraphic significance of Foraminifera and Ostracoda. Palynology: classification and applications. Stratigraphy of Kerala

#### **Module V**

Classification of Mineral deposits. Controls of ore localization. Metallogenic Epochs and Provinces. Ore deposits associated with mafic and ultramafic complexes. Stratabound and stratiform ore deposits. Petroleum Geology: origin, migration and accumulation of petroleum and natural gas. Petroliferous basins of India. Coal Geology: classification, petrography and distribution in India. Methods/Guides to Mineral prospecting; exploratory workings; pitting, trenching and drilling. Sampling methods. Ore reserve estimation. Various methods of geophysical exploration. Geochemical, geobotanical and radiometric methods. Mining terminology, Alluvial, Opencast, underground, coal, and deep sea mining methods. Fundamentals of ore dressing.

#### **Module VI**

Hydrogeological properties and classification of rocks. Types of aquifers. Movement of groundwater. Darcy's law and aquifer parameters. Ground water prospecting. Geophysical methods. Use of Remote sensing for ground water exploration. Well hydraulics: aquifer test and pumping test. Sea water intrusion and Ghyben- Herzberg principle. Quality of groundwater Physical, chemical properties. Graphical representation of groundwater quality data. Rainwater harvesting and other method ground water recharge and conservation. Types of remote sensing. Principles of

aerial and satellite remote sensing. Elements of aerial photo interpretation. Application of remote sensing data in geomorphology, environmental studies, land use, land cover studies; mineral and ground water exploration. Microwave remote sensing. Geographic Information system—Fundamental concepts and components.-applications in Geology.

## **MODULE -VII**

Recent development in Geology

## **PART II -General Knowledge, Current Affairs & Renaissance in Kerala**

### **RENAISSANCE IN KERALA**

#### **TOWARDS A NEW SOCIETY**

Introduction to English education - various missionary organisations and their functioning- founding of educational institutions, factories, printing press etc.

#### **EFFORTS TO REFORM THE SOCIETY**

##### **(A) Socio-Religious reform Movements**

SNDP Yogam, Nair Service Society, Yogakshema Sabha, Sadhu Jana Paripalana Sangham, Vaala Samudaya Parishkarani Sabha, Samathwa Samajam, Islam Dharma Paripalana Sangham, Prathyaksha Raksha Daiva Sabha, Sahodara Prasthanam etc.

##### **(B) Struggles and Social Revolts**

Upper cloth revolts.Channar agitation, Vaikom Sathyagraha, Guruvayoor Sathyagraha, Paliyam Sathyagraha. Kuttamkulam Sathyagraha, Temple Entry Proclamation, Temple Entry Act .Malyalee Memorial, Ezhava Memorial etc.

Malabar riots, Civil Disobedience Movement, Abstention movement etc.

#### **ROLE OF PRESS IN RENAISSANCE**

Malayalee, Swadeshabhimani, Vivekodayam, Mithavadi, Swaraj, Malayala Manorama, Bhashaposhini, Mathnubhoomi, Kerala Kaumudi, Samadarsi, Kesari, AI-Ameen, Prabhatham, Yukthivadi, etc

#### **AWAKENING THROUGH LITERATURE**

Novel, Drama, Poetry, *Purogamana Sahithya Prasthanam*, *Nataka Prashtanam*, Library movement etc

#### **WOMEN AND SOCIAL CHANGE**

Parvathi Nenmenimangalam, Arya Pallam, A V Kuttimalu Amma, Lalitha Prabhu. Akkamma Cheriyan, Anna Chandi, Lalithambika Antharjanam and others

### **LEADERS OF RENAISSANCE**

Thycaud Ayya Vaikundar, Sree Narayana Guru, Ayyan Kali. Chattampi Swamikal, Brahmananda Sivayogi, Vagbhadananda, Poikayil Yohannan (Kumara Guru) Dr Palpu, Palakkunnath Abraham Malpan, Mampuram Thangal, Sahodaran Ayyappan, Pandit K P Karuppan, Pampadi John Joseph, Mannathu Padmanabhan, V T Bhattathirippad, Vakkom Abdul Khadar Maulavi, Makthi Thangal, Blessed Elias Kuriakose Chaavra, Barrister G P Pillai, TK Madhavan, Moorkoth Kumaran, C. Krishnan, K P Kesava Menon, Dr. Ayyathan Gopalan, C V Kunjuraman, Kuroor Neelakantan Namboothiripad, Velukkutty Arayan, K P Vellon, P K Chathan Master, K Kelappan, P. Krishna Pillai, A K Gopalan, T R Krishnaswami Iyer, C Kesavan. Swami Ananda Theerthan, M C Joseph, Kuttippuzha Krishnapillai and others

### **LITERARY FIGURES**

Kodungallur Kunhikkuttan Thampuram, KeralaVarma Valiyakoyi Thampuram, Kandathil Varghese Mappila. Kumaran Asan, Vallathol Narayana Menon, Ulloor S Parameswara Iyer, G Sankara Kurup, Changampuzha Krishna Pillai, Chandu Menon, Vaikom Muhammad Basheer. Kesav Dev, Thakazhi Sivasankara Pillai, Ponkunnam Varky, S K Pottakkad and others

### **GENERAL KNOWLEDGE AND CURRENT AFFAIRS**

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### **PART III**

#### **Salient Features of Indian Constitution**

Salient features of the Constitution - Preamble- Its significance and its place in the interpretation of the Constitution.

Fundamental Rights - Directive Principles of State Policy - Relation between Fundamental Rights and Directive Principles - Fundamental Duties.

Executive - Legislature - Judiciary - Both at Union and State Level. - Other Constitutional Authorities.

Centre-State Relations - Legislative - Administrative and Financial.

Services under the Union and the States.

Emergency Provisions.

Amendment Provisions of the Constitution.

#### **Social Welfare Legislations and Programmes**

Social Service Legislations like Right to Information Act, Prevention of atrocities against

Women & Children, Food Security Act, Environmental Acts etc. and Social Welfare Programmes like Employment Guarantee Programme, Organ and Blood Donation etc.

## **PART IV**

### **RESEARCH METHODOLOGY/TEACHING APTITUDE**

#### **RESEARCH METHODOLOGY**

- Research: Meaning, Characteristics and types;
- Steps of research;
- Methods of research;
- Research Ethics;
- Paper, article, workshop, seminar, conference and symposium;
- Thesis writing: its characteristics and format.

#### **TEACHING APTITUDE**

- Teaching: Nature, objectives, characteristics and basic requirements;
- Learner's characteristics;
- Factors affecting teaching;
- Methods of teaching;
- Teaching aids;
- Evaluation systems.

***NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper.***