

INTRODUCTORY REGULAR COURSE: GEOLOGY

SEMESTER I/II/III

GEOLOGY -IRC

(Credits: Theory-03 Lectures-45)

Marks: 100 (End Semester Examination=75, Semester Internal Examination=20, Class Performance & Attendance =05)

Pass Marks: = 40

Instruction to Question Setter for

Semester Internal Examination (SIE 20 marks):

There will be two group of questions. Group A is compulsory which will contain two questions. Question No.1 will be very short answer type consisting of five questions of 1 mark each. Question No.2 will be short answer type of 5 marks. Group B will contain descriptive type two questions of ten marks each, out of which any one to answer.

End Semester Examination (ESE 60 marks):

There will be two group of questions. Group A is compulsory which will contain three questions. Question No.1 will be very short answer type consisting of five questions of 1 mark each. Question No. 2 & 3 will be short answer type of 5 marks. Group B will contain descriptive type six questions of fifteen marks each, out of which any four are to answer.

Unit-I:

Introduction to geology and its scope, Earth and solar system: origin, size, shape, mass, density and its atmosphere. A brief account of various theories regarding the origin and age of the earth; Brief idea of interior of earth and its composition.

Unit-II:

Weathering and erosion: factors, types and their effects, Earthquakes: types, origin, nature of seismic waves, their intensity and magnitude scale; Volcanoes: types, products and causes of volcanism, Plate Tectonics & its types with example, Continental drift, Isostasy & Mid Oceanic Ridge.

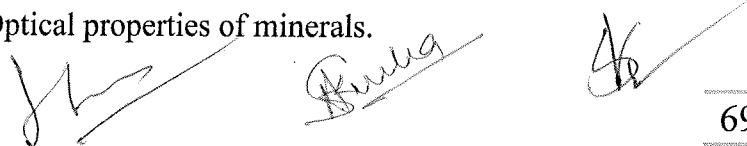
Unit-III:

Introduction to Structural Geology; contours, topographic and geological maps; Elementary idea of bed, dip and strike, Fold, Fault, joints, unconformity: its types & recognition in the field. Principle of stratigraphy, Stratigraphy of Gondwana, Vindhyan & Cuddapah supergroup & its type area; Geological Time Scale, definition of Fossils and Mode of preservation condition of fossilization and significance of fossils. Invertebrate and Plant Fossil.

Unit-IV:

Crystal form, face, edge, solid angle; Interfacial angle and their measurements; Crystallographic axes, angles & symmetry elements with different crystallographic system. Introduction to Mineralogy, Definition and characters of mineral. Common physical properties of minerals- Talc, Gypsum, Calcite, Fluorite, Apatite, Orthoclase, Quartz, Topaz, Corundum, Diamond, Muscovite, Biotite, Hypersthene, Olivine, Hornblende. Optical properties of minerals.

Session 2022-26 onwards



Unit-V:

Magma: definition, composition, types and origin; Forms of igneous rocks; textures, structure & classification of igneous rocks. Processes of formation of sedimentary rocks; Classification, textures and structures of sedimentary rocks, Definition of metamorphism; Type of metamorphism. Factors, zones, grade & facies of metamorphism, textures and structures of metamorphic rocks.

Unit-VI:

Concept of ore and ore deposits, ore minerals and gangue minerals; Tenor of ores; Strategic, Critical and essential minerals, Origin, mode of occurrence & distribution of Metallic and non-metallic ore minerals in India- Iron, Copper, Aluminium, Gold, Uranium, Lead, Zinc, Chromite & Manganese. Coal: origin, types & distribution, Petroleum: origin, occurrence & distribution, Nuclear minerals & its uses

Reference Books:

- *Earth Materials- Introduction to Mineralogy and Petrology*, Cornelis Klein and Anthony Philpotts, Cambridge University Press, 2013.
- *Understanding Earth (Sixth Edition)*, John Grotzinger and Thomas H. Jordan, 2010, W.H. Freeman and company, New York.
- Davis, G. R. (1984) *Structural Geology of Rocks and Region*. John Wiley Billings, M. P. (1987) *Structural Geology*, 4th edition, Prentice-Hall.
- Park, R. G. (2004) *Foundations of Structural Geology*. Chapman & Hall.
- Mason, B. (1986) *Principles of Geochemistry*. 3rd Edition, Wiley New York.
- Rollinson, H. (2007) *Using geochemical data – evaluation, presentation and interpretation*. 2nd Edition. Publisher Longman Scientific & Technical.
- *Energy and the Environment* by Fowler, J.M 1984. McGraw-Hill
- *Global Energy Perspectives* by Nebojsa Nakicenovic 1998, Cambridge University Press.
- *Energy Resources and Systems: Fundamentals and Non-Renewable Resources* by Tushar K. Ghosh and M. A. Prelas. 2009, Springer
- *Introduction to Wind Energy Systems: Hermann-Josef Wagner and Jyotirmay Mathur*. 2009, Springer.
- *Renewable Energy Conversion, Transmission and Storage*. Bent Sorensen, 2007, Springer.

