

## Faculty of Life Sciences

### M. Sc. (Museology)

**Introduction, chemical composition of atmosphere-** particles, ions and radicals and their formation. chemical and petrochemical reactions in atmosphere, smog formation, pollution by chemicals, petroleum, chlorofluorocarbons. Biological cycles of c, n and p. green house effect, acid rain, air pollution –control and their chemistry. Analytical methods for measuring air pollutants.

**Composition, micro and macro nutrients, pollution** – fertilizers, pesticides, plastics and metals, waste treatment.

Cement, sugar, paper and pulp, drugs, thermal power plants, nuclear power plants etc. disposal of wastes and their management

Chemical solution to environmental problems, biodegradability, principles of decomposition, Bhopal gas tragedy, Chernobyl, three miles island, sewage and minamata disasters

**Nomenclature-** generic name, trade names

Raw materials for organic compound: petroleum natural gas, fractional of crude oil cracking, reform, hydro forming, isomerisation,

Coal: types, structures, properties, distillation of coal, chemicals derived there from

**Renewable natural resources:** cellulose, starch –properties, modification, important industrial chemical derived from them, alcohol and alcohol based chemicals, oxalic acid, furfural.

**Basic metallurgic operations:** pulverization, calcinations, roasting, refining.

Physicochemical principles of extraction of : iron, copper, lead, silver, sodium, aluminum, magnesium, zinc, chromium.

Inorganic materials of industrial importance: Their availability, forms structure and modification, Alumina, Silica, Silicates, Clays, Mica, Carbon, Zeolites.

**Material Science** :- Mechanical properties of material and change with respect to temperature. Materials of construction used in Industry.

Materials of Alloys- Important metals and alloys, iron, copper, aluminum, lead, nickel, titanium, and their alloys- mechanical and chemical properties and their applications.

**Glass-** Types, composition manufacture, physical & chemical properties, Applications.

**Pollution-** Air, oxygen, nitrogen cycle, water, Biosphere, Flora and Fauna, Energy, Soil. Pollutants and their statutory limits, various pollution evaluation methods.

**Classification of Polymers-** Natural, synthetic, inorganic, organic, thermoplastics, thermo sets, glasses, fibers etc.

## **Angiosperms: Identification, Nomenclature, and Classification:**

Comparison of systems of classification ( Bentham & Hooker and Engler & Prantal): Primitive and Advance features; salient features of the International Code of Botanical Nomenclature.

Diagnostic features of the following families with reference to local flora and economic importance: Ranunculaceae, Malvaceae, Brassicaceae, Pappilionaceae, Caesalpiniaceae, Solanaceae, Astraceae, Poaceae.

## **Ecosystem development and energy flow:**

Ecosystem: Concept and structure, energy flow, ecological efficiencies, cycling of C, N and P. Biotic and abiotic components their interrelationships. Trophic organisation, autotrophy, heterotrophy, parasitism, detritus and decomposition.

**Systematic in practice-** Importance of herbarium specimens and their preparation; Role of herbaria and botanical gardens.

**Human ecology and ecological management:-** The Human population , renewable and non-renewable resources and their management, conservation of biodiversity, endangered species.

**Geology and its perspective:** Earth in the solar system: origin, size, shape, mass, density, rotational and revolution parameters. Formation of core, mantle, crust, hydrosphere & biosphere. Radioactivity and age of the earth.

Origin of oceans, continents and mountains. Earthquake and earthquake belts, its measurement.

Volcanoes: types and distribution.

Magma: Definition, physical properties and chemical composition, origin.

Types of rocks and their significance.

Palaeobiology: definition, branches and scope. Preservation potential of organism, requirement of fossilization. Fossils, process of fossilization and different kinds of fossils.

Elementary idea about origin of life.

Stratigraphic classification and correlation. Methods of collecting Stratigraphic data, surface data, sub-surface data.

**Introduction to Natural History:** Ecology & Evolution, Geological time chart, Taxonomy and binomial nomenclature, Concept of species and genus.

Characteristic features of animal phyla from protozoa to mammals.

Current Environmental Issues and Nature Conservation.

**Cell structure and chemical organisation:** Techniques in cell biology, cell culture, cell theory, structure of prokaryotic and eukaryotic cells, animal and plant cell, chemical organisation of cell.

**Genetics:** Mendelian inheritance, genetic control and pedigree. Gene interaction Linkage and crossing over, sex determination. Structure of chromosome, Chromosomal disorder and karyotypes( Human).

**GENERAL KNOWLEDGE PERTAINING TO :**

Cultural and Natural Heritage of India (Tangible & Intangible): Dances, festivals, Music, Drama, monuments, traditions & rituals, flora, fauna, national parks, bird sanctuaries, fragrances and calls & voices of animals etc.

History, History of Arts, History of Science.

Current environmental and health Issues.

Important Museums, Archives and Libraries of India.

Other important current event and issues of the world.