

## **Syllabi for Entrance Test in Ph.D. (Tech.) Programme in**

### **Ceramic Engineering**

- Physics and Chemistry of Clay Minerals
- Refractories: Definition, Classification, Important Properties & Applications.
- Introduction to Glass & Vitreous Coatings.
- Introduction to Hydraulic Binders & Concretes.
- Introduction to Fine Ceramics, Electronic Ceramics.
- Analysis of important Ceramic Raw Materials and Products.
- Physical Testing of Ceramic Raw Materials & Products.

### **Petrochemicals and Petroleum Refinery Engineering**

- Crude Oil & Petroleum Product Analysis-Qualitative & Quantitative
- Common Refinery Operations-Desalting, Distillation, Stripping, Absorption, Solvent Extraction, Dewaxing, Desulphurizing, Reforming and Cracking.
- Petrochemical Feedstock: Preparations & Olefins Production
- Computer Operations-MS Windows XP Packages, Win word, Excel, Power Point.
- Optimization & Correlation Methods.
- Programming Languages, any one of –C/C++/Fortran 90/VB/VC++ & Handling Compilers of any of these.

### **Oil Technology**

- Chemistry & Technology of Fats & Oils-Sources, Chemistry, Processing, Physical and Chemical Properties.
- Nutritional Aspects of Fats & Oils.
- Edible and Non-Edible applications of Fats & Oils.
- Lipid Derivatives/Fat based Oleochemicals.
- Chromatographic Analysis of Fats, Oils and Allied Products.
- Basic Operational Principles of UV, IR, GC, HPLC, GC-MS, LC-MS, Short Path Distillation etc.
- Lipid Biotechnology.
- Fat-based Surfactants.
- Basic Chemistry and Technology of Surface Coating.
- Perfumery Chemistry.

## **Pharmaceutical & Fine Chemical Technology**

- Principles of Analysis of Drugs & Fine Chemicals in Pharmaceutical & Cosmetic Formulations by

Chemical, Physico-Chemical, Biological and Micro-Biological Methods.

Biological Standardization.

Toxicity Studies of Drugs. Statistical Methods of Evaluation.

- Rational Drug Design. Study of Synthetic Drug like Prostaglandins, Steroids and anti-HIV,

biologically active Peptides, newer chemotherapeutic agents, chemically targeted drugs etc.

- Principles & Engineering, Fermentation of Dextran, Lactic Acid, Antibiotics of importance.

Manufacture of Immunological Products like Bacterial and Viral Vaccines, Human Immunoglobulin, Monoclonal Antibodies, Tissue Culture Products and their utilization.

Development of Genetic-Engineering Products. Bioreactors & Biosensors.

- Pre-formulation, manufacturing techniques of Novel Drug Delivery Devices. Unit Operations

involved in formulations. Stability Studies, Product Development, GMP/GLP.

Pharmacokinetics,

Pharmacodynamic, Drug interactions.

- Optimization of Pharmaceutical and Bioprocesses. Programming languages-Fortran, C, C++ and

Basic.