

SPECIFIC PAPER SYLLABUS FOR THE POST OF SCIENTIFIC OFFICER (TOXICOLOGY SECTION)
IN THE DIRECTORATE OF FSL IN THE DEPARTMENT OF POLICE

1. FORENSIC SCIENCE:

Introduction: Definition and Scope and Forensic science, History and Development of Forensic Science, Organization of the Forensic Science Laboratories, functions of a Forensic Scientists.

2. The Scene of Crime:

Crime Scene search for physical evidence, photography, sketching, collection, preservation, packing and transportation of evidence materials, maintaining the chain of custody.

3. Physical evidence:

Their significance, class and individual characteristics, identification and individualization of physical evidence, Lucard's exchange principle, Mobile Forensic Science Laboratory and its deployment in scenes of crime.

4. Toxicology:

(a) Introduction, Classifications of poisons and poisoning, mode of action, signs and symptoms in cases of poisoning by common poisons, Dose response relationship, LD-50 and ED-50, Pharmacodynamics, factors influencing in the toxicity, biochemical basis of toxicity, Toxicities of pesticides, tranquilizers hypnotics and sedatives.

(b) Isolation and purifications of poisons.

(c) Screening tests for poisons commonly encountered in toxicological analysis.

(d) Analysis of gaseous and volatile poisons, Analysis of Inorganic poisons (Cations and anions), Analysis of neutral poisons (Organic nonvolatile), Analysis of basic drugs/poisons (Organic non volatiles), Analysis of acidic drugs/poisons (Organic non volatiles), Analysis of plant poisons and Analysis of miscellaneous poisons like insect and animal toxins, mechanical poisons etc.

(e) Chromatography: Introduction, development, methods of classification, Theory and principle (distribution coefficient, rate of travel, retention time, adjusted retention time, retention volume, corrected retention volume, adjusted retention volume, specific retention volume and relative retention).

(f) Thin layer chromatography: Stationary phase, mobile phase, solvent strength, selectivity, resolution, development techniques, advanced techniques in TLC and advantages and disadvantages.

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5. Instrumental analysis in Toxicology:

Modern instrumental techniques, Principles and their applications in Toxicology:

Gas- Chromatography (GC), Gas- Chromatography - Mass Spectrometer (GC-MS), Gas- Chromatography - Infrared Spectrometer (GC-IR), High Performance Thin Layer Chromatography (HPTLC), Atomic Absorption Spectrophotometer (AAS), Atomic Emission Spectrophotometer (AES), UV-Visible Spectrophotometer, Inductively Coupled Plasma Atomic Emission Spectrometer (ICP-AES), X-Ray Fluorescence Spectrometer (XRF), Fourier Transform Infrared Spectrometer (FTIR), Raman Spectrophotometer, Nuclear Magnetic Resonance Spectrometer (NMR), Liquid Chromatography-Mass Spectrometer (LC-MS), Inductively Coupled Plasma- Mass Spectrometer (ICP-MS), Mass Spectrometer- Mass Spectrometer (MS-MS)