

SYLLABUS- FORENSIC SCIENCE

SECTION-'B'

Unit- 1- Forensic Science-

Definition, scope and need of forensic science. Historical development and basic principle of forensic science, branches of forensic science. Ethics in forensic science. Duties and qualification of forensic scientist. Crime scene management and investigation including its protection and documentation like note taking, sketching, photography and videography. Physical evidences: their types, significance, nature, location, collection, packing, preservation, labelling and forwarding to the forensic science laboratory. Chain of custody. Reconstruction of crime scene.

Development of Forensic Science in India

Functioning and Organisational set up:- BPR&D, DFSS, CFSLs and State FSLs, GEQD and SEQD, Finger Print Bureau, Scene of Crime Mobile Forensic Units and their role and functioning at district level, Model of Madhya Pradesh. Criminal Justice System.

Unit-2- Physical Evidence

Physical Evidence - Definition, Properties, Importance in crime investigation, Physical evidence Vs human evidence. Various types of Physical evidence. Identification, Collection, Preservation, Packing & Forwarding of Key Physical evidence on various types of Crime Scene- Hanging, Burning, Drowning, Hit & Run, Crime Scene involving firearms and other types, Suicide Vs Homicide. Marks & Impressions as Physical evidence. Searching methods at Crime scene.

Fundamental right articles 20,21,22, constitution of courts, hierarchy of courts and their powers, evidence in enquires and trials, expert witness, criminal procedure code 291,292, 293. Indian Evidence Act: section 32, 45, 46, 57, 58, 60, 73, 135, 136, 137, 138, and 141. Indian Penal Code: sections pertaining to offence against property (Sections: - 378, 383, 390, 391, 420, 463, 497, 499, 503 and 511), offences against person (sections: - 299, 300, 302, 304B, 307, 309, 319, 320, 324, 326, 351, 354, 359, 362 375, 376, 377).

Unit-3- Microscopy

Microscope and its parts, function and application in forensic science. Basic principles, working and forensic application of simple, compound, comparison, fluorescence, phase contrast, polarizing, stereo and scanning electron microscope.

Microscopic Examination of various forensic exhibits- Biological (various biological fluids, Hairs, Diatoms), Physical (Various marks & Impressions, Fibers, Glass, Soil, Fired Cartridges & Bullets).

Unit-4-Spectrophotometry- Introduction, fundamental laws of spectrophotometry, principles, techniques and application of ultra-violet spectroscopy, Visible Spectroscopy, infra-red spectroscopy, Raman spectroscopy, atomic absorption, atomic emission spectroscopy, ICP-AES, NMR spectroscopy and mass spectrometry in forensic science. Interference in AAS and background correction methods. Interference and background correction in AES.

X-ray Techniques: introduction, properties of x-rays, overview of various x-rays techniques. Basic theory and principles, instrumentation, forensic application of x-ray diffraction and x-ray fluorescence.

Unit-5- Chromatography

Introduction, basic principles and types of chromatography. Paper, column and thin layer chromatography: basic principle theory and instrumentation, visualization, densitometry, HPTLC-method, forensic applications. Gas chromatography: basic principle, theory and instrumentation pyrolysis GC, GC-MS and forensic application. Liquid chromatography: basic principle, theory, and instrumentation, LC-MS and forensic application.

Unit- 6- Electrophoresis

Basic principle, theory, and general principles, various factors affecting electrophoresis, low and high voltage electrophoresis, horizontal and vertical electrophoresis. Theory and basic principles, instrumentation, and forensic application of immuno-electrophoresis, polyacrylamide gel electrophoresis and capillary electrophoresis.

Unit-7- Psychological Techniques in Forensic Science

Principles and legal aspects of Polygraph, Narco analysis and Brain mapping including their concepts, significance, method, future perspective of the technique, limitations.

Unit-8- Wild Life Forensic and Forensic Medicine

Introduction, importance, wildlife protection act 1972, protected and endangered species of animals and plants. Collection, identification, examination and significance of wildlife exhibits. DNA techniques in wildlife investigations. Wildlife DNA data bank and its utility.

A general introduction of post mortem examination and exhibits, different identification techniques in living and dead, mode of death, types of wound and injuries and their medicolegal importance.

Brief introduction of Autopsy, Medico legal aspects and their forensic relevance. Modes of death, post mortem changes in the body and factors affecting them. Types of Wounds and Injuries and their medico legal interpretation.

Unit-9-Computer Forensic

Introduction to computer and cyber-crime: hacking, virus, phishing, pornography, software piracy, programme manipulation and ATM frauds.

Role of forensic scientist in computer crime investigation and prevention, forensic methodologies at crime scene, digital evidence in criminal investigation: standard operating procedure for evidence collection and data seizure: type of evidence: the chain of custody.

Unit-10-Forensic Statistics

Type of data, collection of data, measure of central tendency, dispersion of data. Probability and proof. Distribution and of random errors, reliability of results, tests of significance, confidence interval, paired t-test, correlation and linear regression, the number of replicate determination, analysis of variance, the value of statistics in forensic science.