Paper I

PGDF1: Crime Scenario and Criminal justice System in India

Lecture per week: 4
Total mark: 100

Unit I: Basis of Crime

Definition of Crime, Nature of Crime, Essentials of Crime, Criminals and society, Criminal Conspiracy, various types of crime under IPC, Crime against State, Crime against Army, Navy, and Air Force, Crime against public Tranquility, Crime relating to public servant, Offences relating to election, False evidence and offence against public justice, Offence relating to Coin and Government stamps, Offence relating to weight and measures, Offence relating to Religion.

Unit II: Law of Crime

Offence affecting human body- Culpable homicide, Murder, Hurt, Wrongful restraint and wrongful confinement, Kidnapping, Abduction, Sexual offence, Rape, Offence relating to document, Offence against property.

Unit III: Criminal Justice System

Important wings of criminal justice system it's structure and functioning, Police officers, Prosecution and Judicial Officers, Forensic Scientists, Medico legal Doctor.

Unit IV: Related Law

Arms Act 1959

Important provisions, Definition sec 2, Acquisition, Possession, manufacture, sale, import, export and Transport of arms and ammunition sec 3 to12, Provisions relating to Licences sec 13 to 18 , Offences and Penalties sec 25 to 33

Explosive Act 1984, Explosive Substances Act 1908

Unit V (Related Law)

Chemicals Act 1934, The drugs Act 1940, The drugs and Cosmetic Act 1945, Rifles Act 1920 Small coins (offence) Act 1971, Standards of weight and measures Act 1976.

Paper II

PGDF2: BASICS OF FORENSIC SCIENCE AND CRIME INVESTIGATION

Lecture per week: 4
Total mark: 100

Unit I: Basics of Forensic Science

Introduction to Forensic-Science, History & Development of Forensic Science., Organizational structure of Forensic Science labs in Central & State. Tools and technique of Forensic science, Fundamental Principles Forensic Science, Problem of Proof in Forensic Science. Defining the Scene of crime, managing a crime scene & its hierarchy, Role of First Responding Officers, Search Patterns of a crime scene. Crime scene Documentation, Collection, Packaging, Labeling & Forwarding of exhibits to forensic laboratories. Criminal profiling, Role of Forensic scientists, medico-legal doctors, Preservation of evidence, Health & Safety Protocols.

Cases of special Importance

Pertaining to forensic examination (Biology, serology, chemistry, toxicology) documents, fingerprints, ballistics, photography and physics, Voice identifications, Tape authentication & Computer frauds pertaining to forensic examination of cases

Unit II: Nature, Need & Scope of Forensic Science

Nature, Need and scope of Forensic Science, Crime Scene Evidences: Viscera, Blood, Semen & other Biological fluids, Shoe impressions, Tool marks, Tire marks, Bite Marks, Hair – Animal & Human, Fibers & Fabrics, Glass, Soil, pollen, Paint

Establishment of identity of Individuals: DNA, Fingerprints/Foot prints, Anthropology – Skeletal Remains. Introduction and application in Forensic Science: Forensic Journalism, Odontology, Preventive Forensic, Wild life forensic.

Impressions and Prints: Footprints: Importance, Gait Pattern, Casting of footprints in Different medium, taking Control samples. Tire Marks/prints and Skid marks, taking control samples, Forensic Significance. Lip Prints- Nature, Location, collection and evaluation, taking control samples, Forensic Significance. Bite Marks- Nature, Location, collection and evaluation, taking control samples, Forensic Significance. Ear Prints- Nature, Location, collection and evaluation, taking control samples, Forensic Significance

Unit-III Crime Scene Management, Reconstruction & Crime Scene Analysis

Components of Crime Scene Management – Information management, manpower, technology & logistics management, role of crime scene managers and first responding officers, educational background & hierarchy. Understanding crime scene security, contamination control, documentation protocols and maintaining health & safety procedures. Crime Scene **Reconstruction:-** Defining crime scene reconstruction, nature & stages of crime scene reconstruction, reconstruction based on blood spatter patterns, shooting range of firearm projectile and gunshot residue, linking cases by MO and Signatures. Defining Crime Scene Analysis, interpretation of exhibits, role of a crime scene analyst, theory & principles of analysis, arguments and ethics in crime scene analysis and data interpretation.

Unit IV: Questioned Document and Fingerprint

Questioned Document: Definition, Introduction and component of document. Handwriting and signature-analysis: Principle, identification and examination. Types of forgery, Anonymous letter Charred document, Indented writing. Counterfeit coins and note Instrument used for document examination. **Fingerprint:** History and development of Fingerprints, Formation of ridges, Pattern types, Pattern areas, Classification of Finger Prints- Henry System of classification, Single digit classification, Chance Finger Prints, Latent and Visible Finger Prints, Plastic Finger Prints, Composition of Sweat, Development of Latent Finger Prints. Taking of Finger Prints from Living and Dead Persons, Preserving and Lifting of Finger Prints, Photography of Finger Prints, Comparison of fingerprints, basis of comparison, class characteristic, individual characteristic, various types of ridge characteristics.

Unit V: Forensic Ballistics

A) Forensic Ballistics: History and Background of Firearms, Their Classification and Characteristics Various Components of Small arms, Smooth Bore and Rifled Firearms Rifling: Various Class Characteristics and Purpose of Rifling, Types of Rifling and Methods to Produce Rifling, Trigger and Firing Mechanism Cartridge: Firing Mechanism, Projectile Velocity Determination, Theory of Recoil, Identification of Origin of Improvised/Country made/Imitative Firearms and Their Constructional Features. Ammunition, Projectiles, Mechanism of Firing, Bullet, Weapon & Cartridge case Identification GSR-Detection and analysis, Nature of Injuries – Entry & Exit wounds, Range of Fire and factors affecting it, Primary causes of vehicular accidents, Analytical tools to evaluate accident

Paper III

PGDF3: Law of Evidence and Related laws in Forensic Science

Lecture per week: 4
Total mark: 100

Unit I: Law of Evidence

Definition of Evidence, Types of evidence, Oral evidence, proof of facts by oral evidence, oral evidence must be direct evidence, Documentary evidence, proof of contents of documents, primary evidence and secondary evidence, public document private document.

Unit II : Expert testimony

Witnesses, who may testfy, dumb witnesses, Examination of witnesses, order of production and examination of witnesses, judge to decide as to admissibility of evidence, Examination in chief, Cross examination, Re examination.

Unit III: (Related Law)

Prenatal Diagnostic Techniques Act 1984: Definition, Regulation of pre-natal diagnostic techniques, Central supervisory board, Offences and penalties.

Medico-Leal Aspects – Mental Health Act 1987: Definitions, Mental health authorities, Protection of human rights of mentally ill persons, Penalties and procedure.

Unit IV: (Related Law)

Medical Termination of Pregnancy Act 1971: Definitions, when pregnancies may be terminated by medical registered practitioners, Power to make regulations, Protection of action taken in good faith.

The Narcotic drugs & Psychotropic Substances Act 1985: Definition, Authorities and officers, National fund for control of drug abuse. Prohibition, control and regulation, Offences and penalties, Procedure, Forfeiture of property derived from used in, illicit traffic.

Unit V: (Related Law)

Prevention of Food Adulteration Act 1954, Drugs and Cosmetic Act 1940

Prevention of Damage to Public Property Act 1984, Petroleum Act 1934 , The poisons Act 19

Paper – IV

PGDF4: FORENSIC MEDICINE AND RECENT ADVANCES IN FORENSIC SCIENCE

Lecture per week: 4
Total mark: 100

Unit-I: Forensic Medicine and Toxicology

Definition and development of Forensic Medicine, Post Mortem examination, Death, manner of death, modes of death, cause of death, sudden death, signs of death and changes following death. Estimation of post mortem interval, Forensic Entomology, Post mortem chemistry of body fluid like blood, CSF and vitreous humour, presumption of death and presumption of survivorship Violent asphyxial deaths: Hanging, Strangulation, Suffocation and Drowning Examination of decomposed, mutilated and burnt bodies. **Toxicology-** Definition, Branches, Scope and Importance of Toxicological Examination .Poisons- Definition, Classification of Poison, Mode of poison administration, Absorption, Distribution, Metabolism, Excretion of Poison, Action of Poison, Factor modifying action of Poison .Diagnosis of Poisoning, Collection and Preservation of Viscera,

Unit- II: Wounds and Injuries

Determination of time since death including histo- pathological methods. Wounds: - Mechanical injuries & their medico legal aspects in relation to nature of injuries, accidental, suicidal, homicidal distinction between injuries caused during life and after death. Medico legal examination of injured person. Regional and Transportation injuries. Examination of weapon in relation to inflicted injuries. Firearm and Thermal injuries. Causes of death from wounds. Injuries and Thermal death from cold coma, heat coma, electricity coma, lightning and radiation. Death from starvation.

Unit-III: Forensic Anthropology and Forensic Odontology

Forensic Anthropology: - Definition, Scope and problems, Human skeleton, Personal Identification: Identification of the living and dead, determination of race and religion, sex, age, external peculiarities such as moles, birth marks, occupational marks, anthropometry, finger prints, and foot prints handwriting etc. and their medico legal aspects. Evaluation of evidence from the skeleton. Problems of reconstruction, superimposition technique.

Forensic Odontology: - Development and scope, role in mass disaster and Anthropology, comparative anatomy of teeth and their functions, Determination of age from teeth: eruption sequence, Gustafson method etc. Congenital abnormalities and disease of teeth: their significance in personal identification.**Bite marks**: - Forensic significance, collection and preservation of bite marks, photography of bite marks

Unit IV: Analytical Techniques

Instrumentation

General Introduction, Basic principle and Forensic application of following Techniques: Thermal analytical method, Differential thermal Analysis, Thermo-gravimetry, and Inductive coupled plasma spectrograph, Laser micro spectral analysis

Electrophoretic Technique: Basic principle, Technique and forensic application of Gel diffusion, Iso electric focusing, Immuno Electrophoretic technique Basic principle, Technique and forensic application of Gas chromatography, UV-Visible spectroscopy, IR spectroscopy, FTIR, HPLC.

Unit V: Investigative Technique

Brain mapping-

Introduction, EEG, P-3000 wave, significance in Forensic Science, Limitation of technique, admissibility in court, case study.

Polygraph:

Principle and technique polygraph as forensic investigative tool, NHRC Guidelines for polygraph test, case study.

Facial reconstruction: Method and technique, facial reconstruction in forensic Identification.

Forensic DNA Finger Printing:

DNA-Introduction, source of DNA in Forensic case work, Extraction of DNA, Techniques of DNA fingerprinting-RFLP, STR, PCR. DNA fingerprinting in paternity disputes, mass disaster and other forensic case work, legal issues in DNA fingerprinting, case study.

Narco analysis:

Theory, forensic significance of Narco-analysis, admissibility in court, Future prospect, case study.

Chemical & Toxicological Analysis

Drugs of Abuse & Narcotic drugs, Toxicological examination of poisons & alcohol
Toxicological examination of Viscera, Petroleum Products, Food Adulteration

Explosives

Definition of Explosion & Detonation Chemistry of explosives.
Home-made bombs & Improvised Explosive Devices (IEDs) Disposal & Handlin