SYLLABUS - FORENSIC BIOLOGY

SECTION-C

UNIT-I

Forensic Biology: Definition and scope Importance, nature, location, collection and preservation of biological exhibits and crime scene investigation of biological evidence.Cell: Definition, Theories, Classification and Significance of Cells in Forensic Science. Cell Organelles and their Functions, Difference between Eukaryotic and Prokaryotic Cell, Difference between Plant and Animal Cell**.** Cell Division: Definition, Types, Difference between Somatic and Germinal Cell and Totipotency and Apoptosis. Basic Concept in Brief for Anatomy and Physiology of Digestive, Respiratory, Circulatory, Skeleton, Nervous, Excretory and Reproductive System etc.

Unit-2

Basic Plant biology- plant cell structure and function, basic plant tissues, modes of plant reproduction, plant classification schemes, subspecialties of forensic botany such as plant morphology, plant anatomy, plant ecology, limnology etc. Essential parts of plants.Plant as evidence.Common poisonous plant and types of plant toxins.

Unit-3

Botanical evidences:- Forensic importance, Introduction, types, location, collection, preservation and evaluation of –

Wood: types of wood and anatomy, methods of identification and comparison. Leaves: Identification of various types of leaves and their anatomy, methods of comparison.Pollens: Structure, function, methods of identification and comparison. Seeds and spores: structure and formation in fungi, gymnosperm and angiosperm.

Forensic Diatomology: Diatoms: Nature, classification, location, structure, life cycle, extraction from various body tissues including bone marrow, preparation of slides, methods of identification and comparison, forensic significance.

Unit-4

Basic Molecular biology- the structure of DNA, source of dna sample, extraction, profiling, restriction fragment length polymorphism, polymerase chain reaction, short tandem repeat markers, single nucleotide polymorphism markers, determination of ethnicity, determination of physical appearance, determination of personality traits, mitochondrial dna, RNA, and DNA database.

UNIT-5

Forensic examination of Hair:- Importance, nature, location, structure, growth phases of hair, collection, evaluation and tests for their identification, variation in different major population groups, somatic origin.Fiber Examination: Introduction, Classification, Fiber transfer and persistence. Fiber Recovery: at the scene, in the laboratory, contamination and its prevention.Importance nature, location, collection, evaluation and tests for their identification fiber Identification and comparison: Microscopic Examination, Optical properties (Refractive Index, Birefringence) Instrumental analysis, dye analysis by TLC, factors affecting the strength of fiber evidence.

UNIT-6

Forensic odontology: Development and scoperole in mass disaster and anthropology, structural variation in teeth (human and non-human) types of teeth and their functions, determination of age from teeth: eruption sequence, Gustafson's method, dental anomalies, their significance in personal identification. Bites marks: Forensic significance, collection and preservation of bite marks, photography and evaluation of bite marks, Legal aspects of bite marks.Lip Prints in forensic investigations

Unit-7

Wildlife forensics: Importance of Wildlife (Protection) Act-1972, its Schedules in the protection of endangered species of flora and fauna. Identification of wild life materials such as skin, fur, bones, nails, horn, teeth, plants, plant parts and products by conventional and modern methods, Identification of Pug marks of various animals, DNA techniques in wildlife investigations.

UNIT-8

Forensic Entomology: General entomology and arthropod biology, insects of forensic importance, collection of entomological evidence during death investigations. the role of aquatic insects in forensic investigations, insect succession on carrion and its relationship to determine time since death, factors influencing insect succession on carrion, its application to forensic entomology. Forensic Microbiology: Types and identification of microbial organisms of forensic significance.

UNIT-9

Forensic Anthropology: Definition scope and Problems, Human skeleton, comparative skeletal anatomy of human and non-human. Classification of bones, Identification of bones and determination of site.Age determination from skeletal remains General considerations. suture closure in skull and ossification in other bones. Sex determination from skeletal remains: skull, pelvis and other bones.Estimation of stature from skeletal remains with special reference to long bones.

Unit-10

Personal Identification techniques as somatoscopy, somatometry, osteometery and craniometery their importance. Portrait Parle/Bertillon system, Forensic Composite imagery: Photofit/identi kit system for facial reconstruction. Cranio facial super imposition techniques as photographic super imposition, Video- superimposition, Roentgenographic superimposition Crime scene Blood Stain Pattern Analysis- biological properties of human blood, formation of blood stains, types of blood stain patterns, photography of blood stain patterns, analyzing spatter patterns.Identification of blood and biological fluids by preliminary and confirmatory examination.

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