

**অসম লোকসেৱা আয়োগ****ASSAM PUBLIC SERVICE COMMISSION**

Jawaharnagar, Khanapara, Guwahati-781022.

(1) Name of Post: Scientific Officer for Directorate of Forensic Science, Guwahati, Assam.

SYLLABUS

(Master Degree Standard)

SUBJECT: EXPLOSIVES AND GENERAL STUDIES

(Multiple Choice Objective Type)

Full Marks: 200 Marks**Time: 2 Hrs****PART-A****1. Crime Scene Management**

Introduction to the crime scene, Types of crime scene, Evaluation and processing of crime scene, securing the scene of crime, Documenting the crime scene (Note making, Sketching, Photography, videography of crime scene), role of the first arriving officer at the crime scene Digital Imaging of Crime Scene, 3-D scanning technique. Searching techniques of Crime scene, Processing of physical evidencediscovering, recognizing and examination of physical evidence, Collection, Safety measures for evidence collection. Preservation, Packaging, sealing, labelling and forwarding of physical evidence, Maintaining the chain of custody, Probative value of physical evidence, Reconstruction of scene of crime. Introduction to physical evidence, Types of physical evidence, Classification and Role of physical evidence in Criminal Investigations & Trails.

2. Introduction to Explosives

Introduction of Explosives, Definition, History and Development of explosives, Oxygen balance, Explosive powerand power index, TemperatureForce and pressure of explosionKinetics of explosivereactions, Classification of explosive materials, Low and High explosives Primary and Secondary charge, Low explosives: History of Development of Propellants, single base double base, triple base, degressive and progressive powders.

Commercial and military explosives, Initiating Devices, Safety fuse, Detonators, Pyrotechnics, Propellants shattering, Various types of IEDs, Circuit and electronics of IED device, their initiation mechanism and their reconstruction.

Combustion and deflagration, Detonation, Thermal decomposition, Mechanics of explosion, generation of shock wave and the effect of fragmentation.

3. Processing of explosion scene

Role of Forensic Scientist in the post blast investigation, Documentation of bomb scene and Collection of post blast residues, Evaluation and Assessment of explosion site and reconstruction of sequence of events, clandestine explosive manufacturing. Analysis of post blast residues by chemical spot test, microscopic method and various instrumental techniques including chromatographic, spectroscopic and electrophoresis methods, Explosives Act and Explosives Substance Act.

4. Arson and Burning Cases

Legal definition of Arson and its motives. Types and Chemistry of fire, fire triangle, thermodynamics of fire, NFPA 921 and NFPA1033, The chemistry and physics of combustion, Dynamics of fire, Development of fire, Separation and analytical techniques of ignitable liquid residues, Interpretation of data obtained from fire debris, Arson debris, burnt articles, flammable liquids, their collection, preservation and analysis, Dowry death cases: Investigation and Analysis. Quality Assurance in fire debris analysis report writing and Court testimony, Arson, Accidental, vehicular and electrical fire investigations. Fire safety and firefighting techniques. Prevention of fire, Role of Forensic Science in investigation of fire, cause of ignition and evidence collection.

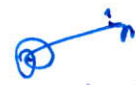
5. Spectroscopic and other techniques

Electromagnetic radiations and their properties General properties of electromagnetic radiations: Wave and Quantum mechanics Interaction of EMR with matter Photoelectric effect, De Broglie-Bohr Theory and derivation of equation, Heisenberg uncertainty principle, Plank's Quantum theory Davisson and Germer Experiment, Electronic spectra and molecular structure.

Spectroscopic Techniques: Absorption, Emission and Transmission Spectroscopy, Ultraviolet and visible spectroscopy: Instrumentation and Applications. Infrared Spectroscopy: Molecular vibration, Theory of IR absorption, IR Basics of Mass Spectroscopy Introduction to Chromatography: Theory of separation techniques, Types of chromatography and their Forensic Applications, Thin layer chromatography, High Performance Liquid Chromatography, Gas Chromatography.

PART – B

- 1. General Knowledge.**
- 2. General English.**
- 3. General Science.**


Controller of Examinations,
Assam Public Service Commission
Khanapara, Guwahati-22
