অসম লোকসেৱা আয়োগ
ASSAM PUBLIC SERVICE COMMISSION
Jawaharnagar, Khanapara, Guwahati-781022.

Advertisement No.01/2025 dated 10.01.2025

2. (B) Name of Post: Scientific Officer for Regional Forensic Science Laboratories at Silchar, Tezpur, Bongaigaon, Dibrugarh and Jorhat respectively under the Directorate of Forensic Science, Assam.

SYLLABUS

(Master Degree Standard)

SUBJECT: DRUGS AND NARCOTICS AND GENERAL STUDIES

(Multiple Choice Objective Type)

Full Marks: 200 Marks **Time: 2 Hrs**

PART-A

1. General Chemistry

Atomic structure and periodic properties of elements. Chemical bonding,IUPAC nomenclature of organic compounds and coordination complexes. Isomerismand stereochemistry including coordination compounds, conformational analysis, andchirality. Reactive intermediates and organic reaction mechanism, concept ofaromaticity. Qualitative and quantitative analysis, mole concept, normality, molarity,molality, mole fraction and their calculations.VSEPR Theory, hybridization and shapesof molecules.Transition and inner transition metals, coordination chemistry, concept of acids and bases, pH and its measurements.

Chemistry of natural products, such as steroids, alkaloids, terpenoids, peptides andcarbohydrates.Organic name reactions: Aldol reaction, Diel's-Alder reaction, Benzoin condensation, Principle and applications of photochemistry, Jablonski diagram, quantum yield, photosensitization reactions, Norrish-I & Norrish-II, Pericyclic and Free radical reactions.Common reagents used in organic synthesis.

Chemical Kinetics, Order andmolecularity of reaction. Pseudo order, zero order, first and second order reactions.Half life period of a reaction. Determination of order of reaction.Effect of temperatureon reaction rate. Activation energy. Catalysis. Theories of catalysis (intermediatecompound and adsorption theories). Mechanism and kinetics of catalysis.Characterization of enzyme catalyzed reactions.

2. Instrumentation/Analytical Chemistry:

Chromatographic techniques. General principles of paper chromatography,column chromatography, TLC, gas chromatography, HPTLC & HPLC foridentification and quantification. Basic concept, principles and application ofspectroscopic techniques viz. UV-Visible, IR, FTIR, Raman and NMR and Massspectrometry.

X-ray diffraction, fluorescence analysis, TGA, DTA, GC-MS. Theory andprinciples of electrophoresis and titrimetric analysis.Analysis of dyes and pigments, fertilizer, cement and glass.

3. **Fundamentals of Forensic Chemistry**

Analysis of alcohol: Country made, illicit liquor & medicinal preparations. Analysis of various denaturants of alcohol, detection & determination of ethanol, methanol,aldehyde, ester by colour test & instrumental techniques.

Analysis of metals and alloys, petroleum products and their adulteration. Method of identification of inflammable materials, Analysis of trap cases, mechanism of colour reaction, detection of phenolphthalein. Comparison of dyes in fibres and different inks by TLC & UV- Vis spectrophotometer.

Classification of explosive;- primary, secondary or high explosive, detonators, pyro-techniques, propellant IEDs and their firing mechanism.

Methods for extraction of explosive from post blast materials/debris, qualitative analysis of explosive and explosion residues by colour test, TLC/HPTLC, HPLC, IR, &LC-MS techniques.

4. **Narcotic Drugs and Psychotropic Substances**

History and Introduction of Narcotic Drugs and Psychotropic Substances, Controlled Substances, Classification of Narcotic Drugs, Process of Narcotic drug synthesis, Precursor Chemicals, Clandestine drug laboratories, Mandatory Provisions of NDPS Drugs, Commonly abused drugs, Analysis of drugs of abuse by various chemical and instrumental methods. Narcotic & psychotropic substance; including depressants, stimulants, hallucinogens,barbiturates benzodiazepines, designer drugs & club drugs etc; their sampling andanalysis using colour test, TLC & further confirmation by HPTLC, UV-Vis., GC-MS,HPLC, LC-MS and I.R.Detection of common adulterants & determination of percentage purity in seized sample.

5. **Forensic Toxicology**

Forensic Toxicological examination and its significance, Branches of toxicology, Introduction and scope, Classification of poisons: based on their origin, mode of action, chemical nature, sign and symptoms of poisons. concept of dose response-relationship, therapeuticindex, Toxicokinetics and Toxicodynamics, drug and drug classification. Drug poison and medicines. Drug design based onchemical modification.Laws related to poison. Poison Act1919 and Drugs Act 1940 & 1955. Different methods of extraction for volatile poisonof organic & Inorganic nature from biological matrix.

Identification and estimation of poison and drugs using colour test, thin layerchromatography, GC, GCMS, UV-visible, I.R. and LC-MS techniques.Analysis of gaseous and volatile poisons, toxic metals, anions, organo-chloro, orgno-phosphorous, carbamate, pyrethroids, aluminum and Zinc phosphide.

Methods of analysis of common acidic, neutral and alkaline drugs & poisons.

Various path of metabolism of common poison, their distribution and method ofextraction, isolation and identification of metabolites.Identifications of food poison, plant poison and animal poison.

PART – B

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

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Principal Controller of Examination
Assam Public Service Commission
Khanapara, Guwahati-22