

ಕ್ರಮ ಸಂಖ್ಯೆ	ಹುದ್ದೆ	ಪಠ್ಯಕ್ರಮ
		ಪತ್ರಿಕೆ-2
1	ಸಹಾಯಕ ಪರಿಸರ ಅಧಿಕಾರಿ	<p style="text-align: center;">SYLLABUS FOR COMPETITIVE EXAMINATION FOR THE POST OF ASSISTANT ENVIRONMENTAL OFFICER</p> <p>1. GENERAL</p> <ul style="list-style-type: none"> . Global Environmental concerns . Global conventions for environment protection . Types of Pollution- Natural and Man made . Effects of Pollution . Environmental laws of India <p>2. WATER</p> <ul style="list-style-type: none"> . Water treatment methods <p>3. WATER POLLUTION</p> <ul style="list-style-type: none"> . Sewage Pollution-sources and effects . Sewage treatment methods . Design of UGD system/Water supply . Design of Sewage Treatment Plants (STP) . Operation and Maintenance of STP . Objective & salient features of water (Prevention & Control of Pollution) 1974 <p>4 INDUSTRIAL EFFLUENT</p> <ul style="list-style-type: none"> . Source and effects . Effluents treatment methods . Design of Treatment Plants . Operation and Maintenance of ETP <p>5. AIR POLLUTION</p> <ul style="list-style-type: none"> . Air Pollution- source and effects. . Ambient Air Quality Standards . Air Pollution controls System . Design of Pollution Control Equipments . Operation & Maintenance of Air Pollution Control . Objective & salient features of Air (Prevention & Control of Pollution)1981

		<p>6. SOLID WASTE</p> <ul style="list-style-type: none"> . Municipal Solid Waste . Source, Composition and effects . Objective and salient features of Municipal Solid Waste Management & Handling <p>7. HAZARDOUS WASTE</p> <ul style="list-style-type: none"> . Objective and Salient features of Hazardous Waste(Management& Handling 1989) <p>8. NOISE</p> <ul style="list-style-type: none"> . Sources and their effects. . Ambient Noise Standards . Noise Control measures . Objective and salient features of the Noise Pollution(Regulation&Control)2000 <p>9. HOSPITAL WASTE</p> <ul style="list-style-type: none"> . Types of Biomedical Waste generated in Hospital. . Treatment and disposal of Bio-medical waste . Objective and salient features of Bio-medical(Management&Handling)1998 <p>10 ISO 14000 Series Environment Management Standards</p> <ul style="list-style-type: none"> . Types of standards and their uses.
2	ಸಹಾಯಕ ವೈಜ್ಞಾನಿಕ ಅಧಿಕಾರಿ	<p style="text-align: center;">SYLLABUS FOR WRITTEN TEST FOR SELECTING ASSISTANT SCIENTIFIC OFFICERS</p> <p>. Periodic table and Atomic properties The long form of periods table, Cause of periodicity, Cause of recurrence of properties. Division of elements into s.p.d and blocks. Atomic properties.</p> <p>. CHEMICAL BONDING Types, ionic, covalent, coordinate, hydrogen and agnostic bonds, Ionic radius ratio rule, Lattice energy.</p> <p>.ACIDS AND BASES Arrhenius concept, Proton transfer theory, Concept of Lowry and Bronsted, Lux- Flood concept, Super acids, HSAB concept and illustration.</p>

. OXIDATION AND REDUCTION

Oxidation number, Galvanic cells, single electrode potential, Sign of electrode potentials, Electrochemical series, Nernst equation, Applications of electrochemical series, Source of electrical energy in a galvanic cell, Hydrogen overvoltage, Oxygen overvoltage.

.STATISTICAL TREATMENT OF ANALYTICAL DATA AND SAMPLING

Classification of errors, systematic errors, source, effects and their reduction. Accuracy and precision. Minimisation of errors, Significant figure .Mean, Median and standard deviation. Sampling and handling, representative sample, sample storage, sample pretreatment and sample preparation. Hazards in sampling. Quality in analytical laboratories, quality control and quality assurance, accreditation system.

.ELECTROCHEMISTRY

Nernst equation, redox system, electrochemical cells: Arrhenius theory of strong and weak electrolytes and its limitation. Electrochemical energy sources- Batteries, classification, characteristic, primary, secondary and lithium batteries.

.CHEMICAL KINETICS

Empirical rate laws and temperature dependence: complex reactions: steady state approximation; determination of reaction mechanism; Catalysis : homogeneous and heterogeneous catalysis and their characteristics, mechanism of heterogeneous catalysis.

.TITRIMETRIC ANALYSIS

Titrimetric analysis, classification of reactions in titrimetric analysis, Standard solution , Advantage of the use of the equivalent system, Preparation of standard solutions, Primary standard solutions, theory of acid base titrations, Theory of complexation titrations, Theory of precipitation titrations, Theory of oxidation, reduction titrations.

.POTENTIOMETRY

Fundamentals of potentiometry. Indicator and ion, selective electrodes. Membrane electrodes. Glass electrode for Ph Measurement, glass electrodes for cations other than protons. Liquid membrane electrodes, solid state ion selective detectors Applications of potentiometry. Direct potentiometric measurements, determination of Ph and fluoride. Redox and potentiometric titrations, Balancing redox reactions, calculations of the equilibrium constant of the reaction, titration curves, visual end point detection. Application of redox titrations.

.CONDUCTOMETRY

General considerations, The measurement of conductivity, The conductometric titrations, the basics of conductometric titrations, Apparatus and measurements, Applications of conductometric titrations.

COLORIMETRY AND SPECTROPHOTOMETRY

Theory of Colorimetry and Spectrophotometry. Photoelectric colorimeters, photoelectric spectrophotometers

NEPHELOMETRY AND TURBIDIMETRY

Theory of Nephelometry and turbidimetry, instrumentation for Nephelometry and turbidimetry.

FLAMES PHOTOMETRY AND ATOMIC ABSORPTION SPECTROMETRY

Energy level diagram- atomic adsorption spectra. Flame characteristics. Flame atomizers and electrothermal atomization. Applications. Qualitative analysis and quantitative evaluations.

SOLVENT EXTRACTION

Definition, types, principal and efficiency of extraction, sequence of extraction process, factor affecting extraction, pH, oxidation state, modifiers, synergistic, masking and salting out agent, techniques, batch and continuous extraction, application.

FUNDAMENTALS OF CHROMATOGRAPHY

General description, definition, terms and parameter used in chromatography, classification of chromatographic methods, criteria for selection of stationary phase, and mobile phase, nature and type of mobile phase and stationary phase. Paper chromatography (PC), Thin, layer chromatography (TLC), Gas chromatography (GC), Ion exchange chromatography (IEC).

INTRODUCTION: SOURCES OF WATER, OBJECTIVE OF WATER ANALYSIS, COLLECTION AND PRESERVATION OF WATER SAMPLES, EXPRESSION OF RESULTS.**BASIC CONCEPTS OF CHEMICAL ANALYSIS**

- .Units of measurements, Significant Figure
- .Elements, Compounds and Molecular Weights, Standard Solutions
- .Equivalent weights and Chemical Reactions, Acid, Base, Complexometric Titrations, and Redox titrations
- .Ionisation Equilibria, Ionic Product of Water and pH – Ionisation of Acid and Bases
- .Alkalinity of Natural water, Buffer Solutions, Solubility Product, Logarithmic Concentration Diagrams Complex Formation, Partition Equilibrium, Common ion effect
- .Sources of the Major Ions, Water Characterisation, Water Quality Consequences of the Major Ions
- .Dissolved Oxygen, Solubility, Winkler Method with Azide Modification
- .The Biochemical Oxygen Demand (BOD) Test. BOD Progression Equation, Sample Dilution, seeding
- .Chemistry of Chemical Oxygen Demand (COD) Test, Relationship of COD to Other Water Quality Parameters.

BASIC CONCEPTS OF MICROBIOLOGY

Classification of Micro, Organisms, Nutritional Requirements, Important types of Micro, Organisms. Culture Media, Identification and Enumeration Indicator Bacteria, Coliform Analysis.

3	ಕಾನೂನು ಸಹಾಯಕ	ಸಿವಿಲ್ ಪ್ರಕ್ರಿಯಾ ಸಂಹಿತೆ 1908, ಕ್ರಿಮಿನಲ್ ಪ್ರಕ್ರಿಯಾ ಸಂಹಿತೆ, 1973, ಭಾರತೀಯ ಸಾಕ್ಷ್ಯ ಅಧಿನಿಯಮ, 1872 ಹಾಗೂ ಭಾರತ ಸಂವಿಧಾನ
4	ವೈಜ್ಞಾನಿಕ ಸಹಾಯಕ	Syllabus: Photochemistry, Liquids and Solutions, Periodic Table and Periodic properties, Analytical Chemistry, Basic concepts in Organic chemistry, Aliphatic Hydrocarbons, Chemical Kinetics, Phenols, Fertilizers, Water Technology, Environmental Chemistry, Chemistry of Natural products, Electrochemistry, Spectroscopy of Organic compounds, Industrial Organic chemistry, Physical properties and Molecular structures, Chemical Spectroscopy-I, Chemical Spectroscopy-II, Electroanalytical Methods, Introduction to Biochemistry, Carbohydrates, Proteins, Enzymes, Biological Oxidation, Biochemical Techniques, Metabolism, Molecular Biology
5	ಪ್ರಥಮ ದರ್ಜೆ ಸಹಾಯಕ	ಸಾಮಾನ್ಯ ಕನ್ನಡ/ಸಾಮಾನ್ಯ ಇಂಗ್ಲೀಷ್
6	ದ್ವಿತೀಯ ದರ್ಜೆ ಸಹಾಯಕ	ಸಾಮಾನ್ಯ ಕನ್ನಡ/ಸಾಮಾನ್ಯ ಇಂಗ್ಲೀಷ್
7	ಕ್ಷೇತ್ರ ಸಹಾಯಕ	ಪದವಿ ಪೂರ್ವ ಶಿಕ್ಷಣ ಹೊಂದಿದ ವ್ಯಕ್ತಿಗೆ ಇರಬೇಕಾದ ಸಾಮಾನ್ಯ ವಿಜ್ಞಾನ ಜ್ಞಾನ