SCIENTIFIC ASSISTANT

Section-I: Analytical Ability, Computer Skills and Communication Skills (30 Marks)

Communication skills; Logical, quantitative and visual-spatial reasoning; Computer skills, computer applications and proficiency in using windows, MS office etc.; General knowledge/current affairs.

Section-II: Professional (70 marks)

Physical and Chemical Science: Water - physical characteristics, buffering capacity, Essential and trace elements in living systems, Natural and synthetic polymers and their use, Bio-molecules - chemical components of cell, Bio-geochemical cycles – carbon, nitrogen and phosphorus, Hydrological cycle and global water balance, Toxicity of Heavy metals. Chemical equilibrium, acid base reactions, solubility product; solubility of gases in water; the carbonate system, unsaturated and saturated hydrocarbons. Chemical kinetics, thermodynamics, distribution law, adsorption

Pollution and its types: Atmospheric pollution: causes, consequences and control, Aquatic pollution: causes, consequences and control, Lake types, Primary, secondary and tertiary treatment of sewage, sewage treatment plant, Land pollution: causes, consequences and control, Management of solid wastes, Forest degradation and conservation measures, Water borne diseases, Pesticide problem.

Mathematical Science: Measures of central tendency: Mean, Median and Mode, Statistical methods; mean deviation; standard deviations, type of errors, uncertainty, precision and knowledge of statistically evaluation of data.

Number System, fractions, exponents, surds, squares, square root, cube. Introduction to algebra; algebraic identities, polynomials. Mensuration; triangles, circles, sphere, cone, cylinder

Instrumentation and Chemical Analysis: Quantitative Analysis: Volumetric or Gravimetric, Chromatography: Ascending and Circular, Electrochemistry, Refractometry, Polarimetry, Colorimetry, Solvent Extraction, Ion exchange method.