

SYLLABUS FOR ENTRANCE EXAMINATIONS

1. ASSISTANT ENVIRONMENTAL ENGINEER

Section-I: Analytical Ability and General Knowledge (20 Marks)

The questions in this section will cover logical reasoning, quantitative reasoning, and visual-spatial reasoning along with some questions related to general knowledge/current affairs.

Section – II: Computer Ability (10 Marks)

The questions in this section will cover basic applications of computers, proficiency in using windows, MS office etc.

Section – III: Professional (70 Marks)

Thermodynamics: Laws of conservation of mass and energy; degree of freedom, first and second laws of thermodynamics and their applications.

Fluid Mechanics: Fluid statistics, Bernoulli equation, macroscopic friction factors, dimensional analysis, flow through pipeline systems, flow meters, pumps and compressors, packed and fluidized beds, size reduction and size separation free and hindered settings; centrifuge and cyclones ; thickening and classification, filtration, mixing and agitation, conveying.

Interaction between humans and environment: The physical environment- land water, and climate; Resources and their management - Natural, technological

and human; Concept of sustainability- natural ecosystems and sustainability; Agricultural and Industrial systems from the angles of environment protection; Treatment of water- sedimentation, coagulation; filtration; chlorination; absorption; adsorption, and

miscellaneous methods; Sewage and sewerage systems; Primary and Secondary treatment of sewage- aerobic and anaerobic processes and their applications in the waste water treatment. Environmental ethics, climatic change, wasteland reclamation, environmental protection acts and issues.

Pollution: Definition, causes, effects and control measures of the pollution – air, soil, noise, water, marine and thermal and nuclear pollution, solid waste management, role of Individual in prevention of pollution, disaster management.

2. JUNIOR ENVIRONMENTAL ENGINEER

Section-I: Analytical Ability and General Knowledge (20 Marks)

The questions in this section will cover logical reasoning, quantitative reasoning, and visual-spatial reasoning along with some questions related to general knowledge/current affairs.

Section – II: Computer Ability (10 Marks)

The questions in this section will cover basic applications of computers, proficiency in using windows, MS office etc.

Section – III: Professional (70 Marks)

Fluid Flow and Mechanical Operation: Flow of incompressible Fluids, Laminar and Turbulent Flow in Pipes, Frictional Losses in pipes.

Flow Measurement: Pitot tube, Orifice meter, Venturimeter, Rotameter, and Weir & Notches.

Interaction between humans and environment: The physical environment- land water, and climate; Resources and their management- Natural, technological and human; Concept of sustainability- natural ecosystems and sustainability; Agricultural and Industrial systems from the angles of environment protection;

Water supply and Water Treatment: Sources of water, Water treatment, Types of pipes, laying of pipes. Quality of sewage, laying of sewers, Building drainage and rural sanitation.

3. SCIENTIFIC ASSISTANT

Section-I: Analytical Ability and General Knowledge (20 Marks)

The questions in this section will cover logical reasoning, quantitative reasoning, and visual-spatial reasoning along with some questions related to general knowledge/current affairs.

Section – II: Computer Ability (10 Marks)

The questions in this section will cover basic applications of computers, proficiency in using windows, MS office etc.

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

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; coefficient of variation and standard deviation, Correlation and Regressions, Probability

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

The candidates belonging to Rural Areas will be given additional 5 (five only) marks as per instructions of the Government of Punjab, Deptt. of Personnel (PP-2 Branch), Chandigarh letter no. 12/21/2010-1PP2/ 580 dated 4/4/2011.