



অসম লোকসেৱা আয়োগ

ASSAM PUBLIC SERVICE COMMISSION

Jawaharnagar, Khanapara, Guwahati-781022.

SYLLABUS

(Bachelor Degree Standard)

OMR (based) Screening Test for recruitment to the post of **Urban Technical Officer (Junior Grade-III) – Environmental Engineer** as per Assam Urban Engineering Service cadre under Department of Housing & Urban Affairs, Govt. of Assam (Advt. No.29/2025 dated 30.08.2025)

SUBJECT: ENVIRONMENTAL ENGINEERING

(Multiple Choice Question Type)

FullMarks:100

Time: 2 (two) hours

PART – A		
Sl. No.	Subjects	Topics
1	Linear algebra	Eigen values and eigenvectors; Determinants Matrices; Calculus – Functions; Limits; Partial and total derivatives; Evaluation and application of definite integrals. Differential equations -Linear and non linear ordinary differential equations, including first order and higher order; Probability & Statistics -Random variable; Descriptive statistics ;Probably distributions; Simple and multiple regressions; Hypothesis testing; Risk and reliability. Numerical Methods - Precision, accuracy and error analysis; least square approximation; Solutions to algebraic equations; Numerical integration by trapezoidal and Simpson's rule;
2	Ecology & Environment	Principles of air, water and soil chemistry; Biodiversity; Ecosystem; Wetland; Microbiology & health; Environmental pollution ;Environmental impacts; Environmental threats of urbanisation and industrialization; Environmental laws & legislation; Forestation and deforestation; Environmental Management; Urban forestry; Climate change; Carbon footprints; Carbon sequestration. Specialised topics -Rainwater harvesting.; Green spaces; Green roofing; Renewable energy; Electronic waste; Electric vehicles; Nature-based solutions; Low cost rural sanitation; Urban flood; Urban heat island; Sustainable development.
3	Water & Wastewater	Water and wastewater quality characteristics; Groundwater, river and lake water quality; Lake Eutrophication with thermal stratification; River pollution including oxygen depletion model; Water supply and distribution;; Population forecasting; Surface and ground water treatment methods; Stormwater drainage and domestic sewage conveyance system, Design of sewers including appurtenances; Types of wastewater treatment; Unit operation and processes; Sludge treatment and disposal; Low-cost treatment methods. Solid Waste Management -Types and characterisation of solid, hazardous and biomedical waste; Treatment and management; Design of solid waste management systems; Disposal methods; Landfills design.
4	Air pollution	Sources; Emissions; Pollutants; Health, material & vegetation effects; Atmospheric structure; Meteorological effects; Ambient air quality monitoring and analysis; Atmospheric dispersion; National ambient air quality standards, Air quality act, CPCB & SPCE functions; Air quality index; Air quality data analysis;; Air pollution control methods for industries and automobiles; Global air pollution including international legislations. Noise Pollution –Basics; Sources; Effects; Measurement methods; Sound characteristics & statistical noise levels, Environmental noise assessment methods; CPCB noise quality guidelines; Noise pollution control.

PART - B		
Sl. No.	Subjects	Topics
5	Construction Materials	Roads & Building Materials- Timber, Stone, Brick, Sand, Mortar, Concrete, Paints Bitumen etc. Detailing of Walls, floors, Roofs, Ceilings, Staircases, Doors & Windows, Finishing of Building, Plastering, Painting, Ventilation, Air Conditioning, Lighting & Acoustics etc.
6	Theory of Structure	Bending moment & shear force diagrams for statically determine beams, Analysis of Statically determine structure, Slope and deflection, columns, fixed and continuous beams, elastic theory of arches, suspension girder bridge, analysis of frame, concept of structural stability, retaining wall, moving loads and influence lines.
7	Design of Structure	Design of beams, column, slabs, footing, design of compression members, design of roof truss, pre-stressed concrete, water tank, plate girder, tubular structures, concept of earthquake resistant design, use of Indian Standard Codes, design of bridges.
8	Transportation Engineering	Introduction: Mode of transportation. Highway Planning: geometric design of highways, testing and specifications of paving materials, design of flexible and rigid pavements. Traffic Engineering: traffic characteristics, theory of traffic flow, intersection design, traffic signs and signal design, highway capacity.
9	Engineering Surveying	General Principles, sign convention surveying instruments and their adjustment, recording of survey observations, plotting of maps and sections, errors and their adjustment. Measurement of distances, directions and heights, correction of measure length and bearings, correction for local attractions, measurement of horizontal and vertical angles, levelling operations, refraction and curvature corrections, Chain and compass survey, theodolite and tachometric traversing, traverse computation: plane table survey, solution of two and three points problems contour surveying, setting out direction and grades & type of curves, setting out of curves and excavation lines for building foundation.
10	Geotechnical Engineering	Soil Mechanics: Origin of soils, soil classification, soil compaction, shear strength, soil parameters – liquid limit, plastic limit, plastic index etc. Foundation Engineering: Sub-surface investigations – drilling bore holes, sampling, penetration tests, plate load test. Foundation types : Foundation design requirements, bearing capacity of soil, stress distribution, settlement analysis in sands and clays, deep foundation, pile foundation, pile types, load capacity of piles in sands and clays, negative skin friction.
11	Estimation & Valuation	Introduction, specifications of work, rate analysis, schedule of rates, preparation of estimates for road and building projects. Basic knowledge of value, rental method of valuation, land and buildings methods of valuation
12	Construction Management	Introduction, stages of construction, bar charts and networks, role of equipment and modern construction industries

Enul
4/9/25

Principal Controller of Examinations,
Assam Public Service Commission,
Jawaharnagar, Khanapara, Guwahati-781022