ASSISTANT ENGINEER (CIVIL)

SYLLABUS
(Degree Standard)

Syllabus for Screening Test for Recruitment to the post of Assistant Engineer (Civil) under Public Health Engineering (PHE) Department of Govt. of Assam. The Educational Qualification is Degree Standard.

General Studies:  
Full Marks: 100 Marks  
Time: 2-00 hours

Multiple Choice Objective Type Questions:

(i) Current Events of National & International importance.
(ii) History of India & History of Assam.
(iii) World Geography including India & Assam.
(iv) Indian Economy, Indian National Movement.
(v) Mental Ability.
(vi) Role and Impact of Science and Technology in India.
(vii) Indian Polity, Political System in India.
(viii) Indian Culture.

Civil Engineering:  
Full Marks: 100 Marks  
Time: 2-00 hours

Multiple Choice Objective Type Questions

Statics:  
Coplaner and multi planer system free body diagrams, centroid second moment of plane figure force and funicular polygons, principle of virtual work suspension systems and centenary.

Dynamics:  
Units and dimensions, Gravitational and absolute system, MKS & S.I. Unit.

Kinematics:  
Rectilinear and Curvilinear motion, Relative motion, Instantaneous centre.

Kinetics:  
Mass moment of inertia, simple harmonic motion, momentum and impulse equations of motion of rigid body rotating about a fixed axis.

Strength of Materials:  
Homogeneous and isotropic media, stress and strain elastic constants, tension and compression in one direction riveted and welded joints.

Compound stresses: Principal stresses and principal straints, simple theories of failure.

Bending moments and shear forced diagrams. Theory of bending, shear stresses distribution in cross section of beams Deflection of beams.
Analysis of laminated beams and non-prismatic structures.
Theories of columns, middle-third and middle-fourth rules.
Three pinned arch analysis of simple frames, Torsion of shafts
combined bending direct and torisional stresses in shafts.
Strain energy in elastic deformation, impact fatigue and creep.

Soil Mechanics:
Origin of soils, classification void ration, moisture content
permeability; compaction.
Seepage, Construction of flow nets, Determination of shear
strength parameters for different drainage and stress conditions-
Triaxial, unconfined and direct shear tests.
Earth pressure theories – Rankine’s and Coulomb’s analytical and
graphical methods, stability of slops.
Soil consolidation – Terzaghi’s theory for one dimensional
consolidation, rate of settlement and ultimate settlement, effective
stress pressure distribution in soils, soil stabilization. Foundations
– Bearing capacity of footings, Piles, Wells, Sheets piles.

Fluid Mechanics:
Properties of fluids.
Fluid Statics – Pressure at a points force on plane and curved
surface, buoyancy stability of floating and submerged bodies,
dynamics of fluid flow, Laminar and turbulent flow, equation of
continuity energy and momentum equation, Bernoulli's theorem,
cavitations, Velocity, potential and steam functions, rotational,
irrotational flow, vortices, flow net, Fluid flow measurement.
Dimensional analysis: Units and dimensions – non-dimensional
numbers, Buck-ingham’s pi-theorem, principles of similitude and
application.
Viscous flow: Flow between static plate and circular tubes
boundary layer concepts: drag and lift.
Incompressible flow through pipe: Laminar and turbulent flow,
critical velocity, friction loses, loss due to sudden enlargement and
contraction energy grade lines.
Open Channel flow – Uniform and non-uniform flows, specific
energy and critical depth, gradually varied flow surface profiles,
standing wave flume, surges and waves.

Surveying:
General principles, sign convention surveying instruments and
their adjustment, recording of survey observations, plotting of
maps and sections, errors and their adjustments. Measurement of
distances, directions and heights, correction to measure length and
barring, correction for local attracts, measurement of horizontal
and vertical angles, leveling operations, refraction and curvature
corrections, Chain and compass survey, therdolite and
techeometric traversing, traverse computation; plane table survey,
solution of two and three points problems, contour surveying,
setting out direction and grades & type of curves, setting our of
curves and excavation lines for building foundations.