Recruitment for the post of Assistant Engineer (Civil) under Panchayat & Rural Development Department.

SYLLABUS
(Degree Standard)

Paper- I (General Studies)
(Multiple Choice Objective Type Questions)

Full Marks: 100 Marks
Time: 2.00 (two) Hours

Section- A: : 60 marks

(i) Current events of national & international importance.
(ii) History of India & Indian freedom movement.
(iii) History of Assam.
(iv) Geography of India & Assam.
(v) Indian Polity & Constitution of India.
(vi) Literature, Sports, Tribes, Culture and festivals of Assam & North East.
(vii) Environment/ Ecology of Assam.
(viii) Role and impact of Science and Technology.
(ix) General mental ability.
(x) Economy of India & Assam.

Section- B: : 40 marks

(i) Rural Development schemes/ programmes of Govt. of India & Govt. of Assam.
(ii) Poverty alleviation programmes of Govt. of India and Govt. of Assam.
(iii) Five years plans and rural economy.
(iv) Panchayati Raj system.
(v) Technology used for implementation of Rural Development schemes/ programmes.

Paper- II (Civil Engineering)
(Multiple Choice Objective Type Questions)

Full Marks: 100 Marks
Time: 2.00 (two) Hours

1) Engineering Mechanics :

Simple stress and strain; analysis of plane stress and plane strain; Mohr's circle of stress and strain; bending moment and shear force; simple bending theory; flexural and shear stresses; columns and struts; uniform torsion.

(2) Structural Analysis :

Determinate and indeterminate structures; analysis of beams, trusses, arches, cables and frames; deflection in beams; moment distribution method slope deflection method; conjugate beam method; rolling loads and influence lines.

(3) Building Materials :

Building materials- stone, sand, timber,' bricks, cement, structural steel, paint, concrete, Technology-cement its properties, classification and specification, provisions in I.S. code, properties of coarse and fine aggregates, production of fresh concrete, concrete mix design; Reinforcement - bending bars, permissible stresses, splices in tensile & compression, joining & lapping, minimum spacing, cover; Detailing of walls, floors, roofs, ceilings, doors and windows, stair cases; Finishing of Building, plastering, painting, ventilation;

(4) Design of Concrete Structure :

Working stress, limit state and ultimate load design concepts; design of simple and continuous beams, slabs, columns, footings; principles of prestressed concrete design, materials, methods of prestressing, losses in prestressing, anchorages.

(5) Soil Mechanics:

Origin of soils; soil structure and fabric; three-phase system and phase relationships; index properties; identification and classification of soils; permeability- one dimensional flow, Darcy's law; seepage through soils two - dimensional flow, flow net- its construction and uses; seepage through homogeneous earth dam with and without filters; compaction in laboratory and field conditions; one-dimensional consolidation; time rate of consolidation; shear strength of soils; stress at a point; Mohr's stress circle; soil stabilization.

(6) Foundation Engineering :

Types of foundation, selection criteria; earth pressure theories- Rankine and Coulomb; stress distribution in soils- Boussinesq's and Westergaard's theories; shallow foundations- Terzagbi's and Meyerhoff's bearing capacity theories, effect. of water table, combined footing and raft foundation, contact pressure, settlement of foundation in sand and clay; deep foundations- types of piles, dynamic and static formulae, load capacity of piles in sands and clays, pile load test, negative skin friction.

(7) Fluid Mechanics and Hydraulic Engineering :

Fluid properties and definitions; fluid statics- hydrostatic pressure, measurement of pressure, pressure on submerged surfaces, buoyancy; fluid kinematics; continuity momentum and energy equations applicable to fluid flow; viscous flow; flow in pipes; pipe networks; concept of boundary layer and its growth; dimensional analysis and hydraulic similitude; open channel flow- uniform flow, energy-depth relationships, specific energy, critical flow, gradually varied flow, hydraulic jump; basics of hydraulic machines- pumps and turbines.

(8) Hydrology & Watershed Development :

Hydrology cycle; precipitation; evaporation; evapo-transpiration; infiltration; watershed & it's classification, water Budgeting & planning, sources of water-surface and subsurface sources and their characteristics; Runoff components; hydrograph and its components; unit hydrograph; stream-flow measurement; occurrence of ground water; soil-water relationship; aquifers; application of Darcy's law; yield from wells for confined and unconfined aquifers; watershed interventions in (i) non-arable /ridge area, (ii) on-farm/ arable area & (iii) drainage line

(9) Irrigation Engineering & Command Area Development :

Crop water requirements; duty; delta; estimation of evapo-transpiration; types of irrigation systems and irrigation methods; design of lined and unlined canals; heads works; design of weirs on permeable foundation; water logging and drainage; canal regulatory works- cross drainage structures, outlets and escapes, command area development & it's interventions.

(10) Flood Management :

Flood estimation- rational, empirical and unit hydrograph methods, design flood; flood routing- definition, reservoir routing and channel routing; flood damage mitigation and river training works; dams and embankments- elements of gravity, arch and earth dams.

(11) Transportation Engineering :

Rural road alignment and engineering surveys; geometric design of rural roads- cross-sectional elements, gradients, super-elevation, camber, sight distances, horizontal and vertical curves, transition curves, grade separations; constriction materials - soil, gravel, moorum , brick,

cement concrete, paver blocks & their desirable properties and quality control tests; pavement design-types of pavement, design factors for flexible and rigid pavements, IRC method of design.

(12) Environmental Engineering :

Water & air pollution – causes, effects and prevention measures; solid & liquid waste management; quantity of sanitary sewage; sewerage systems and their design principles; sewer construction materials; sewer appurtenances; characteristics of domestic sewage; waste water treatment-methods and their sequence; preliminary treatment; primary :treatment, secondary treatment; waste water disposal.

(13) Engineering Surveying :

Classification of surveys; principles of surveying, 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 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 and type of curves, setting out of curves and excavation lines for building foundations.

(14) Cost Estimation :

Introduction, rate analysis and standard specifications, schedule of rates, preparation of cost estimates.

(15) Construction management :

Introduction, stages of construction, types of construction projects; project planning.

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