

SYLLABUS FOR WRITTEN TEST

POST NAME: TECHNICAL ASSISTANT (CIVIL)

Qualification: 3 Year Diploma in Civil Engineering

TECHNICAL MATHEMATICS:

Matrices, Determinants, Trigonometric Functions, Properties of Trigonometric Functions, Properties of Triangles, Solution of Triangles, Functions, Limits & Continuity, Differentiation & Integration.

SURVEYING:

Introduction to surveying, Chain surveying, Plane table surveying, Chain and compass traverse Fundamentals of Leveling, Longitudinal leveling, Cross sectioning & Contouring and permanent adjustment.

Study of theodolite, Angle measurement, Area calculation and plotting, Preparation of Gale's traverse table, Tangential tachometry, Height & Distance, Tachometry, Curves, Types, Setting of curves, Modern survey instruments, Detailed study of Total station & GIS and GPS.

ENVIRONMENTAL SCIENCE AND DISASTER MANAGEMENT:

Renewable and Non-renewable Resources, Ecosystems, Environmental Pollution and its control and Hazards & Disasters and Mitigation measures.

CONSTRUCTION MATERIALS AND ENGINEERING:

Building materials, Ornamental materials for finishing, Construction technology & Building components.

QUANTITY SURVEYING:

Definitions and units of measurements, Earth work computation, Estimation of road work, Detailed Estimate of single storey building, Detailed Estimate for finishing work, water supply & sanitary, work of single storey building, Detailed estimate for WBM road, Analysis of rates & Abstract of estimates of typical building.

Estimate of buildings, Culverts and bridges, Retaining wall, Detailed estimate of RCC members and bar bending schedule Detailed specifications Valuation & rent fixation.

THEORY OF STRUCTURES:

Moment of forces, Support reactions, Centre of gravity, Moment of inertia, Simple stresses and strains, Mechanical properties, Temperature stresses, Strain energy, Beams and bending, Torsion of circular shaft, Thin cylinders, Simple bending & Columns and struts.

Analysis of trusses, Direct and Bending stress, Dams and retaining walls, Analysis of Fixed beams, Beams and bending & Analysis of continuous beam.

IRRIGATION ENGINEERING:

Fundamentals of irrigation & Hydrology, Water requirements of crops, Diversion Head works, Storage Head works & Irrigation canals & Soil Erosion.

HYDRAULICS:

Liquid Pressure and its Measurements, Flow of Liquids, Flow through orifices and mouth pieces, Flow over notches and weirs, Flow through pipes, Flow through open channels, Pumps and Water, Turbines & Hydro Electric Installations.

BUILDING PLANNING & DRAWING:

Building components, Building planning & drawing, Building drawing & Service plan and culverts.

STRUCTURAL & IRRIGATION ENGINEERING DRAWING:

RCC structural elements-I, RCC structural elements-II, structural detailing of steel structures, Irrigation structures & Environmental structures.

CAD & CAM:

Computer Aided Design & Geometric Modeling, Computer Aided Manufacturing Methods.

STRUCTURAL DESIGN:

Introduction to materials, Concept of RCC design-different methods, Concept of limit state design, Flexural design of singly reinforced beams, lintels, doubly reinforced beams & flanged beams, Design of flanged beams, Apply check for shear, stiffness, Torsion, & bond, Design of one way slab & two way slab & Design of staircase, columns and footings.

Introduction to steel structures bolted & welded connections, Design of tension & compression members, Design of beams, Plate girder, Design of truss & Design of masonry wall.

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BUILDING MAINTANANCE AND SERVICE:

Durability of building, Failure and repair of building, Maintenance of building & Building services.

CONSTRUCTION MANAGEMENT & SAFETY ENGINEERING:

Planning and Organizational aspects, Constructional planning, organizational structure, Execution of works, Contracts, Tender and tender notices, Measurement of works, Payment of bills, Introduction to Human Resource Management, Stores, Managing, materials and machinery, Principles of safety in construction activity , Entrepreneurship and management, Introduction to small scale Industries, Introduction to quality control, T.Q.M and I.S.O 9000.

GEOTECHNICAL ENGINEERING:

Properties of soil, Permeability and compaction of soil, Soil exploration & Foundation engineering.

ENVIRONMENTAL ENGINEERING:

Introduction to water supply engineering, Sources of water, Quality of water, Treatment of water, Distribution system, Water supply arrangements in building, Introduction to sanitary engineering, Quality of sewage, Sewer sections and layout, Sewer appurtenances, Sewage treatment and disposal, Solid waste management, Drainage and sanitation in buildings, Rural water supply and sanitation & Pollution control board.

TRANSPORTATION ENGINEERING:

Highway Engineering, Traffic Engineering, Railway engineering, Bridge ,Tunnel, Airport & Harbor.

COST EFFECTIVE CONSTRUCTION & GREEN BUILDING:

Introduction to cost effective construction and green buildings, Technologies & Methods in Construction, Global Warming & the relevance of green buildings & Green Building Rating Systems, Green Design.

GROUND IMPROVEMENT TECHNIQUE:

Methods of ground improvements, Methods of soil stabilization, Reinforced earth and geosynthetics& Consolidation and shear strength of soils.

HABITAT TECHNOLOGY:

Climatology- sustainable development- Environmental management, Interior design, Landscape architecture & Lighting- Acoustics- Town planning.

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CONCRETE TECHNOLOGY:

Study of ingredients of concrete, Properties of concrete and its ingredients, field tests, Properties and mix design & Special concrete and defects in concrete.

DESIGN OF PRE STRESSED CONCRETE:

Working stress method of design, Principles of pre stressing, Design of pre stressed beams for flexure Losses in pre stressing.

INDUSTRIAL ENGINEERING & MANAGEMENT:

Organization Structure, Production Planning and Control, Inspection & Quality Control, Control Charts, Estimating and Costing, Value Engineering, Material Handling, Plant Maintenance.
