SUBJECT : CIVIL ENGINEERING

Engineering Mechanics: Statics, units and dimensions, Sl units, vectors, coplanar and non coplanar force systems, equations of equilibrium, free body diagram, static friction, virtual work, distributed force systems, first and second moments of area, mass movement of inertia.

Kinematic and dynamics : Velocity and acceleration in cartesian and curvilinear coordinative systems, equations of motion and their integration, principles of conservation of energy and momentum, collision of elastic bodies, rotation of rigid about fixed axis, simple harmonic motion.

Strength of Materials : Elastic isotropic and homogeneous materials, stress and strain, elastic constants, relation among elastic constants, axially loaded determinate and indeterminate members, shear force and bending moment diagrams, theory of simple bending, shear stress distribution, stitched beams.

Deflection of beams: macaulay method, Mohr theorems, Conjugate beam method, torsion, torsion of circular shafts, combined bending torsion, and axial thrust, close coiled helicat springs, strain energy , strain energy in direct stress, shear stress bending and torsion, thin and thick cylinders, columns and struts, Euler and Rankiane loads, principle stresses and strains in two, dimensions-Mohcircle-theories of elastic failure. Structural Analysis, indeterminate beams , propped, fixed and continuous beams, shear force and bending moment diagrams, deflections, threechinged and two hinged arches, rib shortening, temperature effects, influence lines.

Trusses: Method of joints and method of os sections, deflections of plance pin-joined trusses.

Rigid frames: Analysis of rigid frames and continuous beam by theorem of three moments, moment distribution method slope deflection method, Kani method and column analogy method matrix analysis. Rolling loads and influence lines for beams and pin joined girders.

Soil Mechanics: Classification and identification of soils, phase relationships surface tension and capillary phenomena in soils, laboratory and field determination of coeff – of permeability, seepage forces, flow nets, critical hydraulic gradient permeability of stratified deposits: Theory compaction, compaction control total and effective stresses, pole pressure coefficient, shear strength parameters, in terms of total and effective stress. Mohr Coulumb theory, total and effective stress analysis of soil slopes, active and passive, pressures, Rankiene and Coulumb theories of earth pressure, pressure distribution on French sheeting walls, sheet pile walls , soil consolidation, Terzahigh one dimensional theory of consolidation primary and secondary settlement.

Foundation Engineering: Exploratory programme for subsurfaces investigations, common types of boring and sampling, field test and their interpretation, water level observations, stress distribution beneath loaded areas by Boussinesq and Steinbrenner methods use of influence charts, contast pressure distribution determination of ultimate bearing capacity by Terzaghi, Skempton and Hansen's methods, allowable bearing pressure beneath footings and rafts settlement enteria, design aspects of footing and rafts, bearing capacity of piles and pile groups, pile load tests, underreamed piles for swelling soil-well foundations, conditions of statical equilibrium vibration analysis of single degree freedom system, general consideration for design of machine foundations: Earthquake effects on soil-foundation system, liquefaction.

Fluid Mechanics: Fluid properties, fluid statics, forces on plane and curved surfaces, stability of floating and submerged bodies.

Kinematics: Velocity, streamlines, continuity equations, accelerations, irratational and rotation flow, velocity potential and stream functions, flow net, separation and stagnation.

Dynamics: Euler's equation along streamline, energy and momentum equations Bernoulli's

theorem application's to pipe flow and free surface flows, free and forced vortices. Dimensional Analysis and similitude: Buckinghum's Pi theorem dimensionless parameter, sunilantics undistorted and distorted models, Boundary layer on a flat plant, drag and lift on bodies.

Laminar and Turbulent: Laminar flow through pipe and between parallel plates, transition to turbulent flow, turbulent flows through pipes, friction factor variation, energy loss in expansions, contraction and other nonuniformities, energy grade line and hydraulic grade line, pipe networks, water hammer.

Compressible flow: Isothermal and isentropic glows velocity of propagation of pressure wave, Mach number, subsonic and supersonic flows shoct waves.

Open Channel flow: Uniform and nonuniform flows specific energy and specific force critical depth, flow in contracting transition, free overall, wires hydraulic jump surges gradually varied flow equation and its integration, surface profiles.

Surveying : General principles : Sign conventions, chain surveying principles of plane table surveying two-point problem, three point problem compass surveying, traversing, bearings, local attraction, traverse computations corrections.

Levelling: Temporary and permanent adjustments, flylevels, reciprocal leveling, controur levelling, volume Computations, refraction and curvature corrections, Theodolite: Adjustments, traversion, heights and distance, tacheometric surveying.

Curve setting by chain and by theodolie, horizontal and vertical curves.

Triangulation and base line measurements, satellite stations, trigonometric levelling, astronomical surveying, celestial coordinates, solution of spherical triangles, determination of azimuth, latitude, longitude and time.

Principles of aeriam photogrametry hydrographic surveying.