Syllabus for ME in Structural Engineering Entrance Examination

Strength of Material: [15%]

Bending Moment and Shear Force in Beams and Frames, Centre of Gravity and Moment of Inertia, Stress and Strains, Thin Walled Vessels, Theory of Flexure, Torsion, Buckling

Structural Analysis: [20%]

Analysis by Strain Energy Method, Analysis of Truss Deflection, Elastic Deflection of Beams, Influence Lines for Simple Structures, Analysis of Statically Determinate Arches and Frames, Suspension Cable System, Slope Deflection Method, Moment Distribution Method, Influence Lines for Continuous Beams.

Steel and Timber Structures: [15%]

Structural Fasteners, Design of Tension Members, Design of Compression Members, Design of Beams, Design Of Composite And Built Up Beams, Design of Plate Girder, Design of Roof Trusses, Design of Timber Structures

Soil Mechanics and Foundation Engineering: [10%]

Phase Relationship, Seepage Through the Soil, Strength and Deformation, Settlement and Consolidation, Retaining Structures on Soil, Stability of Soil Slopes, Subsurface Exploration, Shallow Foundation, Mat Foundation, Lateral Earth Pressure and Retaining Walls, Sheet Piles Wall, Pile Foundations, Drilled – Pier and Caisson Foundation.

RCC and Concrete Technology: [20%]

Design of Flexural Members by Limit State, Limit State Design for Shear and Torsion, Limit State of Serviceability, Development Lengths and Detailing of Reinforcements, Design of Flanged Beams, Design of Slabs, Design of Compressive Members, Design of Foundation, Design of Staircase, Prestressed Concrete (Introduction and Losses) Constituents of Cement, Properties, Manufacturing process and Testing of Cement, Constituents and mixture ratios of Concrete, Aggregates, Workability of Concrete, Concrete Mixing, Concrete Admixtures, Fresh Concrete, Hardened concrete

Mathematics: [20%]

Increments, Limits and continuity, Differentiation, Applications of derivatives, Integration, Application of Definite integral, System of Linear equations, Sequence and infinite Series, Vector spaces, Eigenvalues, Eigenvectors and Linear Mapping, Co-ordinates Systems, Functions of several variables and Their Derivatives, Multiple Integrals, Beta and Gamma Functions, Applications of the Theory of Integration, Vector Functions and Their Derivatives, Vector Integral Calculus, Fourier Series and Integrals, Transformation of coordinates, Polar equations of conic section, General equation of the second degree, Analytic Geometry (3D), Spherical Trigonometry, Fundamental Formulae, First Order Differential Equations, Linear Second Order Differential Equations, Series Solutions of Differential Equations, Laplace Transforms, Partial Differential Equations(PDEs), Complex Variables, Introduction to Statistics and Data Description, Probability, One Dimensional Random Variables, Functions of One Random Variable and Mathematical Expectation, Some Important Discrete Distributions, The Normal Distribution, Random Samples and Sampling Distributions, Estimation, Tests of Hypotheses, Simple Linear Regression and Correlation, Statistical Quality Control