CV	Civil Engineering Syllabus for QT-RA

Reinforced cement concrete (RCC): Reinforced concrete structures, Loadings analytical models for analysis and design of RC structures, Design methodologies: working stress method and Limit state method; Behaviour of RC members under flexure; limit state design of beams for flexure; simply and doubly reinforced rectangular sections.

Highway Engineering: Highway alignment and engineering surveys; Geometric design of highways – cross-sectional elements, sight distances, horizontal and vertical alignments; Highway materials-desirable properties and quality control tests.

Geotechnical Engineering:

Origin of soils, soil structure and fabric; Three-phase system and phase relationships, index properties; Unified and Indian standard soil classification system.

Sub-surface investigations – scope, drilling bore holes, sampling, plate load test, standard penetration and cone penetration tests; Shallow foundations – Terzaghi's bearing capacity theories.

Numerical Methods in Civil Engineering:

Accuracy and precision; error analysis. Numerical solutions of linear and non-linear algebraic equations; numerical differentiation, Integration by trapezoidal and Simpson's rule.

Fluid Mechanics:

Fluid properties, Hydrostatics, the flow measurement, the Bernoulli's theorem and its applications. Flow through pipes, Flow in open channels, weirs, flumes, spillways, pumps and turbines.

Solid Mechanics-Equations of Equilibrium for planar and space structures, Static and Kinematic indeterminacy, Stresses, Strains, Elastic constants, SFD, BMD, Stresses in beams, Principal stresses and principal planes.

Structural Analysis-Determinate and indeterminate structures, Deflection in beams by unit load method, Strain energy concepts.

Design of Steel structures-Bolted connections, welded connections, design of compression members and column bases, Tension members.

Environmental Engineering: Quality of water, source of water supply, purification of water, distribution of water, need of sanitation, sewerage systems.