

# SYLLABUS FOR SUB. ENGINEER CIVIL

Total Questions 150

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- 1) **Building Materials**
  - Bricks** Types, Indian Standard Classification, absorption, saturation, factor, strength in masonry, influence of mortar strength on masonry strength.
  - Cement** Compounds of different type, setting times, strength.
  - Cement Mortar** Ingredients, proportions, water, demand, mortars for plastering and masonry.
  - Concrete** Importance of W/C Ratio, Strength, ingredients, including admixtures, works ability, testing for strength, elasticity, non-destructive testing. mix design methods
- 2) **Structural Analysis:**

Analysis of determinate structures different methods including graphical methods.  
Analysis of indeterminate skeletal frames – moment distribution, slope deflection, stiffness and force methods energy methods, Muller Breslau Principle of application.
- 3) **Design of Steel Structures :**

Principles of working stress method. Design of connections, Simple member, Built-up section and frames, Design of Industrial roofs.
- 4) **Design of Concrete and masonry Structures :**

working stress method of R.C. members.  
Principles of prestressed concrete design, materials structures.  
Design of Simple members and determinate structure.
- 5) **Construction practice, Planning and Management :**

Concreting Equipment  
Weight Batcher, Mixtures, vibrator, plant, concrete pump.  
Cranes, hoists, lifting equipment.  
Earth work Equipment.  
Power shovel, hoe, dozer, dumper, trailers and rollers foot sheep foot rollers pumps
- 6) **Soil Mechanics :**

Properties of soil, Classification and interrelationship : Compaction behavior, methods of compaction, permeability and seepage, flow nets, Inverted filters, compressibility and consolidation, shearing resistance, stresses and failure, soil testing in laboratory and insitu.
- 7) **Surveying :**

Classification of surveys scales, accuracy, Measurement of distances direct and indirect methods, optical and electronic devices, Measurement of direction, prismatic compass, local attraction, Theodolites – type, Measurement of elevation- Spirit and trigonometric leveling.
- 8) **Transportation Engineering :**

Planning of highway systems alignment and geometric design, horizontal and vertical curves, grade separation, Materials and construction methods for different surfaces and maintenance principle of pavement design.
- 9) **Estimating & Costing**
- 10) **PHE Services**

PC  
3/8/2014