BMC SUB ENGINEERR EXAM – SYLLABUS

Technical Syllabus for the post of Civil Engineering	
Sr. No.	**Topics**
1.	**Building Construction & Materials:** Properties of wet and hardened concrete, tests on concrete, factors affecting strength of concrete, water-cement ratio, aggregate cement ratio, mix design, additives, design of form work, types of formwork. Stones, bricks, cements, lime, mortar, timber, plastic, concrete, steel, paints and varnishes. Principles of building planning and design, integrated approach, building bvelaws. building services such as vertical transportation, water supply sanitation, thermal ventilation, lighting, acoustics, fire protection, electrical fittings. Foundations, stones, brick and block masonry, steel and reinforced cement concrete structures, floors, doors and windows, roofs, finishing works, water proofing.
2.	**Strength of materials:** stresses, strains, principal stresses, bending moments, shear forces and torsion theory, bending theory of beam, deflection of beam, theories of buckling of columns.
3.	**Theory of structures:** Analysis of beams, frames and trusses, slope deflection method, moment distribution method.
4.	**Steel structures:** Design of bolted and welded connections, columns, footings, trusses, steel beams, plate girders.
5.	**Design of reinforced concrete structures** (Working stress and limit state): Design of slab, beam, columns, footing, retaining walls, tanks, building frames, staircases.
6.	**Construction planning and Management:** Elements of scientific management, elements of material management, safety engineering, network analysis, construction equipment, site layout, quality control.
7.	**Surveying:** Classification of surveys, measurement of distances-direct and indirect methods, optical and eletronic devices, prismatic compass, local attraction; plane table surveying, levelling, calculations of volumes, contours, theodolite, theodolite traversing, omitted measurements, trigonometric levelling, tacheometry, curves, photogrammetry, geodetic surveying, hydrographic surveying.
8.	**Estimating, costing and Valuation:** Specification, estimation, costing, tenders and contracts, rate analysis, valuation.

9.	**Geo-technical Engineering:** Geotechnical properties, stresses in soil, shear resistance, compaction, consolidation and earth pressure, stability of slopes. bearing capacity, settlements, shallow and deep foundations, cofferdams, ground water control.
10.	**Highway Engineering:** Planning of highway systems, alignment and geometric design, horizontal and vertical curves, grade separation, materials and different surfaces and maintenance, rigid and flexible pavement, traffic engineering
11.	**Bridge Engineering:** Selection of site, types of bridges, discharge, waterway, spans, afflux, scour, standards, specifications, loads and forces, erection of superstructure, strengthening.
12.	**Environmental Engineering**
a.	**Water Supply Engineering:** Sources of supply, design of intakes, estimation of demand, water quality standards, primary and secondary treatment, maintenance of treatment units, conveyance and distribution of treated water, rural water supply.
b.	**Waste water Engineering & Pollution control:** Quantity, collection and conveyance and quality, disposal, design of sewer and sewerage systems, pumping, characteristics of sewage and its treatment, rural sanitation, sources and affects of air and noise pollution, monitoring, standards.
c.	**Solid Waste Management:** Sources, classification, collection and disposal.