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 byelaws, 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.

Technical Syllabus for the post of Mechanical and Electrical Engineering	
Sr. No.	Topics
1.	**Basics of Mechanical Engineering** – Concept of mechanical technology – Milling, planning, shaping, drilling, reaming, grinding, riveting, welding and joining process – types, defects. Super finishing processes – Honing, lapping, buffing Casting, forging, rolling, drawing, forming processes Classification, Selection and application of Machine Tools, Cutting tool material. Coolants, Design of cutting tools or Tool design.
2.	**Theory of Machines** – Belt Drives, Gear Drives, Joints and Coupling, single and multi cylinder engines and v engines, belt and chain drives, degree of freedom.
3.	**Machine Design Concepts** – Torson, Spring, Joints, Bearing – types and Design, Theory of Failure, Factor of Safety, Combined stresses, struts and columns, design of screw and bolts, Design of Shafts and Springs, Keys.
4.	**Strength of material** – stress strain analysis, Trusses and Trough, Shear Stress, Torsion, bending moment and shear force concept, Shear force and bending moments in Beam, Deflection of Beams and different conditions, shafts and helical springs, impact load, torsion of bars
5.	**Fluid Mechanics** – Pumps, Types, Selection, Efficiency, Characteristics etc., Compressible fluid flow, Fluid properties, pressure, Thrust, Buoyancy, Viscosity, Bernoulli's theorem, Hydraulic jump, non-uniform flow, reynold's number, hydraulic gradient, water hammer.
6.	**Manufacturing planning and Control** – Manufacturing planning and control system, Forecasting, Planning Function, Planning for Material Requirements, Scheduling and sequencing, project management, Advance concepts of Production Planning 1 and 2.
7.	**IC engines** – Volumetric and thermal efficiency, SI engines, CI engines, Combustion, Knocking, Supercharging, cooling lubrication and ignition system
8.	**Refrigeration and Air Conditioning** – Thermal Engineering – Ton of refrigeration, concept of latent heat, evaporation concept Thermodynamics – Law of thermodynamics, various Cycles w.r.t. PH curves Design of Refrigeration system – Compressor, Expansion unit, Accumulator, Evaporator, Condenser, Duct design, Vapour Absorption and Compression Refrigeration system Design of Air Conditioning system – Temp. Vs Humidity (8 different concepts), Types of system- split, centralised.

	Latest refrigeration and their examples.
9.	**Parts of Vehicles** – Engine, Chassis, Transmission, drive assembly, alternator, axle, body, wheels, brakes, steering, suspension etc.
10.	**Transmission** – Gear drive design and analysis, Stepped drive Vs Step less drive
11.	**Concept of SI and CI Engines** – Carnot cycle, Reverse Carnot cycle, Rankin's Cycle, Otto cycle, Diesel cycle, SI Vs CI Engine
12.	**Efficiency** – Thermal, Volumetric, Mechanical, Electrical system etc.
13.	4 wheel drive Vs 2 wheel drive, Differential mechanism
14.	Recent trends in Automobiles
15.	**Electrical Fundamentals** – Supply voltage, AC and DC Supply, voltage, current, inductance, resistance, capacitance, 3 phase and 1 phase supply system, electrical power, electrical energy, hv/ Iv supply, active and reactive power transfer and distribution, Reactive power consumption.
16.	**Electrical power transmission & distribution** – Substation & receiving station, earthling, substation equipment, Bus Bar, CT, PT, Protection relay numerical/ digital, circuit breaker, onload isolator, offload isolator, Surge arrestor, system grounding, equipment grounding, lightening protection etc. IS 3043, Single line diagram, control circuit, ladder diagram (PLC).
17	**Insulating material** – Classification, dielectric strength, test & section (Bakelite, FRP, Teflon, PVC, HDPE, Mica, SF6, Vacuum, Oil etc).
18	**Electric Motors (Induction Motors)** – Principle of working, 3 phase, 1 phase motors, motor starting methods, selection rating, cooling and enclosures, HV/LV motors, Motor protection relay, Motor control circuits, IS325, speed control methods-V/F control, slip recovery scheme, pole changing, construction of induction motors and their applications for pump, compressor, crane, actuator, tools, Maintenance & testing.
19	**Cables and wires** – Types, construction, HV/LV cables, testing, fault finding, cable rating and selection, cable jointing, termination.
20	**Statutory requirement of electric installation** – Oil, filtration, die electrical testing, insulation resistance testing, compliances with electrical inspector, safety precautions, permit to work (Lock out) procedure, safety equipment and test instrument, Indian Electricity Rules 1956 – provisions, IEEE, IEC, ESSA.
21	**Illumination (Light)** – Types of light, solar lighting, LED, CLF, HPSV,Mercury lamp, tube light etc.
22	**Principles of Digital Instruments** – Working principles of digital Voltmeter, Ammeter,

	Frequency meter, multimeters, Measurement of Resistance Megger Earth Test Potentiometer.
23	Power Electronics – SCR MOSFET, FET devices, rectifiers and invertor, SMPS, PWM convertor, application.
24	Batteries and UPS, DG sets.
25	Power factor improvement and energy conservation Energy conservation method, audit, solar energy collectors, area calculations, Wind energy, Energy Conservation Act 2006, BEE initiatives and star rating to efficient electrical equipment
26	Fire fighting apparatus and systems – Basics
27	Electrical protection – MCCB, ELCB etc.
28	Provision of National Building Codes on Building services & ventilation, electrical & allied installation, air conditioning, ventilation, acoustic, sound insulation and noise control, installation of lifts and escalators.
29	**Concepts of Electronics** – Diode, Triode, Semiconductor, Forward bias, Reverse bias, Transistor – NPN, PNP.
30	Logic Gates, De'Morgans Theorem, Boolean Logic.
31	Counter, Adder, Flip flops and types
32	**PLC concepts** – Ladder logic, Programming, architecture
33	**SCADA** – Concept, Hardware, Software etc.
34	**Automation** – Timer, Sequencing, Logic
35	**Network Design** – Lan, MAN, WAN, Topology – Ring, Star, Bus.
36	**Data Transmission** – Single, Half duplex, Full duplex, Fibre optic concept
37	Computer Integrated Manufacturing and Technology Driven practices
38	Databases and Warehousing
39	Enterprise Resource Planning
40	Computers in Industrial Engineering
41	Internet vs Intranet

Technical Syllabus for the post of Architect	
Sr.No.	Topics
1	Regional Plan (R.P)
	Need of contents of Regional Plan
	Surveys necessary for Regional Plan
	Design & planning (Architectural) principle of planning
	Building Construction (Architectural point of view) planing
2	Development Plan (D.P.)
	Surveys, types, duration etc.
	Implementation and Financial Aspects.
3	Town Planning Scheme
	Concept of T.P.S
	Relation with D.P.
	Original Plot, Final Plot, Semi-final Plot
	Function of Arbitrator
	Cost of Scheme
4	Building Permission
	a)Building byelaws
	b)Development
	c)Document Required for development permission
	d)Measurement Plan
	e)Layout of Land
	f)F.S.I, TDR
	g)Development charge
5	Transportation
	Surveys
	Classification of Roads
	Public transport needs
	Requirement of civil aviation and Railways
6	Environment Aspects
	Environment Protection Acts.
	Surveys

7	**Acts and Rules**
	MR and TP Act 1996 Restated with D. Plan & Builds Design
	LA Act. 1894
	Environment Act Related with Building planning