VADODARA MUNICIPAL CORPORATION

Environmental Engineer Syllabus

Total Marks: 100

SR.	Name of Subject	
સામાન્ય જ્ઞાન (માધ્યમ:–ગુજરાતી)		**૨૦ ગુણ**
1	• તાજેતરના મહત્વના રાષ્ટ્રીય અને આંતરરાષ્ટ્રીય બનાવો. • ભારત અને વિશ્વ ભૂગોળ. • ભારતની રાજનીતિ. • ભારતની અર્થવ્યવસ્થા. • ભારતનું બંધારણ. • ગુજરાતની ભૌગોલિક બાબતો અને કુદરતી સંપત્તિ • ગુજરાતનો સાંસ્કૃતિક વારસો, સાહિત્ય, કલા, ધર્મ • ભારત અને ગુજરાતનો ઈતિહાસ • ખેલ જગત	
GENERAL CIVIL ENGINEERING		**Marks: 20**
1	• **Fluid Mechanics and Hydraulic Machines** Introduction, Properties of fluid, Statics of fluid, Fluid kinematics, Dynamics of fluid, Orifices, Mouthpieces, Notches, Weirs, Turbines. • **Surveying** Introduction, Linear measurement, Compass surveying, Levelling, Curves, Plane table surveying, Tacheometric surveying. • **Hydrology and Water Resources Engineering** Introduction, Measurement of rainfall, Estimating runoff, Hydrograph analysis, Design flood, Flood routing, Rain water harvesting. • **Estimating and costing** Introduction, Methods of estimation, Specifications, Rate analysis, Contract, Tender, Valuation. • **Highway Engineering** Introduction, Classification of roads, Various components of a road, Pavement, Traffic engineering. • **Construction Management** Introduction, Functions of construction management, classification of construction works, construction stages, CPM, PERT. • **Engineering Mechanics** Introduction, Forces, centre of gravity, Moment of Inertia, Friction, work,	

	power, Energy. • **Strength of Materials** Introduction, Stress, Strain, Types of beams, Types of loading, Shear force, Bending moment. • **R.C.C. Structures** Introduction, Tension and Compression in concrete, Design of Beam, Slab, Column, Pre-stressed concrete. • **Steel Structures**	
ENVIRONMENTAL ENGINEERING		**Marks: 60**
2	**Water Supply Engineering:** Surface and sub-surface Sources; Quantity Estimation- Domestic, Institutional, industrial and fire demand; Pumps and pumping stations; Collection and conveyance; Water distribution networks; Pollutants in water and its effects; Drinking water Standards; Water Treatment Processes- Aeration and gas transfer; Clarification – Sedimentation, Coagulation and flocculation; Filtration; Disinfection; Softening; Treatment Plant Design; Demineralization-Ion-Exchange processes, Membrane Processes- Reverse osmosis and miscellaneous water treatment.	8 marks
3	**Waste Water Engineering:** Planning & design of domestic waste water collection and disposal; Plumbing Systems; Components and layout of sewerage system; Effluent disposal standards; Primary, Secondary and tertiary treatment-Unit operations-unit processes; Sewage treatment Processes-Screening, skimming, sedimentation; Biological treatment processes-aerobic and anaerobic processes; Sludge management including treatment disposal and utilization; Re-use of treated effluents; Industrial waste waters- treatment, disposal and reuse.	8 marks
4	**Analysis of Water and Wastewater:** Physical and chemical characteristics– pH, Electrical conductivity, Turbidity, Alkalinity, Acidity, Hardness, Sulphates, Fluorides, Nitrates; Analysis of solids content - total solids, suspended solids, volatile solids, non volatile solids; Residual chlorine analysis; Indicator organisms, coliforms—fecal coliforms, E. coli, Streptococcus; Optimum coagulant dose; Break point Chlorination; Concept of dissolved oxygen; BOD and COD; Water Quality requirement - Potable water standards; Effluent disposal standards.	8 marks
5	**Solid Waste Management:** Sources & classification of solid wastes; Storage and collection of municipal solid wastes; Analysis of Collection systems; Need for transfer and transport – Transfer stations - labeling and handling of wastes; Planning & design of its management system; Disposal system; Beneficial aspects of wastes and Utilization.	8 marks
6	**Air Quality management:** Air pollutants – Sources and classification of pollutants; effects on human health vegetation and property; Regional and global effects – acid rains, ozone layer depletion, enhanced greenhouse effect; Stack sampling & ambient air quality monitoring methods; Ambient air quality and emission standards; Air pollution control techniques, strategy and equipment- particulate and gaseous emission	8 marks

	control; Air pollution indices.	
7	**Environmental impact assessment:** Evolution of EIA – Concepts, Methodologies – Screening – Scoping – Base line studies - Mitigation – Matrices – Check list; Rapid and Comprehensive EIA, Legislative and Environmental clearance procedures in India; Prediction tools for EIA; Assessment of impacts – Air – Water – Soil – Noise – Biological- Socio cultural environment; Public participation.	8 marks
8	**Environmental Legislation and Management System:** Introduction : Indian Constitution and Environmental Protection; Water (P&CP) Act, Air (P&CP) Act Environmental Protection Act – Institutional framework (SPCB/CPCB/MOEF); **Water (P & CP) Act, 1974:** Responsibilities of occupier, Provision relating to prevention and control, Scheme of Consent to establish, Consent to operate – Conditions of the consents, Outlet; Legal sampling procedures; Penalties for violation of consent conditions etc. Provisions for closure/directions in apprehended pollution situation. **Air (P & CP) Act, 1981:** Responsibilities of occupier, Provision relating to prevention and control, Scheme of Consent to establish, Consent to operate – Conditions of the consents, Outlet; Legal sampling procedures; Penalties for violation of consent conditions etc. Provisions for closure/directions in apprehended pollution situation. **Environment (Protection) Act 1986:** Genesis of the Act; EIA Notification – Municipal Solid Waste Management Rules, Noise Rules, Biomedical Waste Management Rules, Plastic Waste Management Rules, E-waste Management Rules, Construction and Demolition Waste Management Rules.	8 marks
9	**Climate Change and Clean Development Mechanism**	4 marks