

Syllabus for Sandip University Joint Entrance Exam(SU-JEE)

Program Name – SU-JEE M.Tech Civil

Sr. No	Topic/subject/section/Unit Name	Number of Question
1.	<p>Building Materials</p> <p>Bricks: Types, Indian Standard classification, absorption, saturation factor, strength in masonry, influence of mortar strength on masonry strength. Brick masonry: bonds, jointing, plastering, pointing. Types of floors & roofs</p> <p>Cement: Types, Laboratory Tests as per IS code Aggregate – Classification, Physical properties, Tests as per IS code</p> <p>Concrete: Importance of W/C Ratio, Strength, ingredients including admixtures, workability, testing for strength, elasticity, non-destructive tests, Concrete mix design methods.</p> <p>Structural steel: composition, material properties and behaviour. Eco-friendly materials</p>	10
2.	<p>Structural Engineering</p> <p>Engineering Mechanics: System of forces, free-body diagrams, equilibrium equations, internal forces in structures. first and second moment of area, friction and its applications.</p> <p>Strength of materials:</p>	25

	<p>Bending moment and shear force in statically determinate beams; Simple stress and strain relationships; simple bending theory, flexural and shear stresses, Uniform torsion, buckling of column, combined and direct bending stresses.</p> <p>Structural Analysis: Statically determinate and indeterminate structures by force/ energy methods; Method of superposition; Analysis of trusses, arches, beams and frames; Displacement methods: Slope deflection and moment distribution methods; Influence lines</p> <p>Concrete Structures: Basic of working stress and limit state design concepts, analysis of ultimate load capacity and design of members subjected to flexure, shear, compression and torsion by limit state methods.</p> <p>Steel Structures: Welded and Bolted Connections, Analysis and design of tension and compression members by Limit State Method. Beams and beam- columns, column bases. Connections - simple and eccentric, plate girders. Analysis & design of Roof Truss.</p>	
<p>3.</p>	<p>.Geotechnical Engineering</p> <p>Soil Mechanics: Origin of soils, soil classification, three-phase system, preliminary definitions and relationship , Index Properties, permeability & seepage, effective stress principle, compaction, shear strength, stress distribution, earth pressure and stability of slope, geo-environmental engineering .</p> <p>Foundation Engineering: Sub-surface investigations, plate load test, Foundation types-foundation design requirements.</p>	<p>15</p>

	Shallow foundations- bearing capacity, Deep foundations, pile types, earthquake terminology in geo-technics and soil reinforcements	
4.	<p>Water Resources Engineering</p> <p>Fluid Mechanics:</p> <p>Fluid Properties, Pressure, Buoyancy; Flow Kinematics; Continuity, momentum, energy and corresponding equations; Potential flow, applications of momentum and energy equations, Drag, Lift; Laminar and turbulent flow, Boundary layer and Control.</p> <p>Open Channel Hydraulics - Energy-depth relationships, specific energy, critical flow, slope profile, hydraulic jump, uniform flow and gradually varied flow.</p> <p>Hydrology:</p> <p>Hydrologic cycle, Hydrograph , rainfall, evaporation, infiltration, stage discharge relationships, flood estimation, reservoir capacity, reservoir and channel routing. Well hydraulics.</p> <p>Irrigation:</p> <p>Duty, delta, estimation of evapo-transpiration, Crop water requirements, Design of: lined and unlined canals, waterways, head works, gravity dams and spillways, Design of weirs on permeable foundation, Types of irrigation system, irrigation methods, Water logging and drainage.</p>	15
5.	<p>Environmental Engineering</p> <p>Water requirements:</p>	15

	<p>Quality standards, basic unit processes and operations for water treatment. Drinking water standards, water requirements, basic unit operations and unit processes for surface water treatment, distribution of water, Sewage and sewerage treatment, quantity and characteristics of wastewater. Primary, secondary and tertiary treatment of wastewater, sludge disposal, effluent discharge standards. Domestic wastewater treatment, primary and secondary treatment Unit operations and unit processes of domestic wastewater, sludge disposal.</p> <p>Municipal Solid Wastes: Characteristics, generation, collection and transportation of solid wastes, engineered systems for Solid waste management (reuse/ recycle, energy recovery, treatment and disposal).</p>	
6.	<p>Surveying & Transportation Engineering</p> <p>Surveying Common methods of distance and angle measurements, plane table survey, levelling, traverse survey, triangulation survey, contouring, Use of maps. Surveying instruments for above purposes, tachometry. Circular and transition curves, principles of photogrammetry, Total Station</p> <p>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: Principles of pavement design; Drainage.</p> <p>Traffic Engineering: Traffic characteristics, theory of traffic flow, intersection design, traffic signs and signal design, highway capacity.</p>	20

	Planning of railway systems, terminology and designs, relating to gauge, track, controls, transits, rolling stock, tractive power and track modernisation; Maintenance; Appurtenant works; Containerisation.	
	Total	100