GATE 2020 Online Test Series : Civil Engineering

Topicwise Tests

Tests	Test Activation Date	Test Closing Date	Test Syllabus	No. of Ques.	Marks	Timing
TWT-1	15/03/2019	20/02/2020	**Solid Mechanics-1**: Bending moment and shear force in statically determinate beams; Simple stress and strain relationships; Theories of failures.	17	25	45 min
TWT-2			**Solid Mechanics-2**: Simple bending theory, flexural and shear stresses, shear centre; Uniform torsion, buckling of column, combined and direct bending stresses.	17	25	45 min
TWT-3			**Concrete Structures-1**: Working stress, Limit state and Ultimate load design concepts; Design of beams, slabs.	17	25	45 min
TWT-4			**Concrete Structures-2**: Columns; Bond and development length; Prestressed concrete; Analysis of beam sections at transfer and service loads.	17	25	45 min
TWT-5			**Environmental Engg.-1**: Water : 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. Air Pollution: Types of pollutants, their sources and impacts, air pollution meteorology, air pollution control, air quality standards and limits. Noise Pollution: Impacts of noise, permissible limits of noise pollution, measurement of noise and control of noise pollution.	17	25	45 min
TWT-6			**Environmental Engg.-2** : Waste water : Sewage and sewerage treatment, quantity and characteristics of wastewater. Primary, secondary and tertiary treatment of wastewater, effluent discharge standards. Domestic wastewater treatment, quantity of characteristics of domestic wastewater, primary and secondary treatment. Unit operations and unit processes of domestic wastewater, sludge disposal. Municipal Solid Wastes: Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse/ recycle, energy recovery, treatment and disposal).	17	25	45 min
TWT-7			**Fluid Mechanics and Hydraulics-1:** Properties of fluids, fluid statics; Continuity, momentum, energy and corresponding equations; Potential flow, applications of momentum and energy equations; Laminar and turbulent flow; Flow in pipes, pipe networks; Concept of boundary layer and its growth. Dimensional analysis and hydraulic similitude.	17	25	45 min
TWT-8			**Fluid Mechanics and Hydraulics-2** : Forces on immersed bodies; Flow measurement in channels and pipes; Kinematics of flow, velocity triangles; Basics of hydraulic machines, specific speed of pumps and turbines; Channel Hydraulics - Energy-depth relationships, specific energy, critical flow, slope profile, hydraulic jump, uniform flow and gradually varied flow.	17	25	45 min
TWT-9			**Engineering Mathematics-1**: Linear Algebra, Calculus, Probability and Statistics.	17	25	45 min
TWT-10			**Engineering Mathematics-2**: Ordinary Differential Equations, Partial Differential Equations, Numerical Methods.	17	25	45 min
TWT-11			**General Aptitude-1**:Numerical Ability: Numerical computation, numerical estimation, numerical reasoning and data interpretation.	17	25	45 min
TWT-12			**General Aptitude-2**: Verbal Ability: English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction.	17	25	45 min
TWT-13			**Transportation Engg. and Geomatics Engg.-1**: Highway alignment and engineering surveys; Geometric design of highways - cross-sectional elements, sight distances, horizontal and vertical alignments; Geometric design of railway track; Airport runway length, taxiway and exit taxiway design. Photogrammetry - scale, flying height; Remote sensing - basics, platform and sensors, visual image interpretation; Basics of Geographical information system (GIS) and Geographical Positioning system (GPS).	17	25	45 min

TWT-14			**Transportation Engg. and Geomatics Engg.-2**: Highway Pavements: Highway materials-desirable properties and quality control tests; Design of bituminous paving mixes; Design factors for flexible and rigid pavements; Design of flexible pavement using IRC: 37-2012; Design of rigid pavements using IRC: 58-2011; Distresses in concrete pavements. Traffic Engineering: Traffic studies on flow, speed, travel time-delay and O-D study, PCU, peak hour factor, parking study, accident study and analysis, statistical analysis of traffic data; Microscopic and macroscopic parameters of traffic flow, fundamental relationships; Control devices, signal design by Webster's method; Types of intersections and channelization; Highway capacity and level of service of rural highways and urban roads. Principles of surveying; Errors and their adjustment; Maps-scale, coordinate system; Distance and angle measurement - Levelling and trigonometric levelling; Traversing and triangulation survey; Total station; Horizontal and vertical curves.	17	25	45 min
TWT-15			**Structural Analysis-1**: Statically determinate and indeterminate structures by force/ energy methods; Method of superposition; Analysis of trusses, arches, beams, cables and frames.	17	25	45 min
TWT-16			**Structural Analysis-2**: Displacement methods: Slope deflection and moment distribution methods; Influence lines; Stiffness and flexibility methods of structural analysis.	17	25	45 min
TWT-17			**Geotechnical Engg.-1:** Origin of soils, soil structure and fabric; Three-phase system and phase relationships, index properties; Unified and Indian standard soil classification system; Permeability-one dimensional flow, Darcy's law; Seepage through soils - two-dimensional flow, flow nets, uplift pressure, piping; Principle of effective stress, capillarity, seepage force and quicksand condition; Compaction in laboratory and field conditions; One-dimensional consolidation, time rate of consolidation.	17	25	45 min
TWT-18	15/04/2019	20/02/2020	**Geotechnical Engg.-2**: Mohr's circle, stress paths, effective and total shear strength parameters, characteristics of clays and sand. Foundation Engineering: Sub-surface investigations-scope, drilling bore holes, sampling, plate load test, standard penetration and cone penetration tests; Earth pressure theories - Rankine and Coulomb; Stability of slopes - finite and infinite slopes, method of slices and Bishop's method; Stress distribution in soils - Boussinesq's and Westergaard's theories, pressure bulbs.	17	25	45 min
TWT-19			**Geotechnical Engg.-3**: Shallow foundations - Terzaghi's and Meyerhoff's bearing capacity theories, effect of water table; Combined footing and raft foundation; Contact pressure; Settlement analysis in sands and clays; Deep foundations - types of piles, dynamic and static formulae, load capacity of piles in sands and clays, pile load test, negative skin friction.	17	25	45 min
TWT-20			**Steel Structures-1**: Working stress and Limit state design concepts; Design of tension and compression members, Plastic analysis of beams and frames.	17	25	45 min
TWT-21			**Steel Structures-2:** Plate girders and trusses; beams and beam- columns, column bases; Connections - simple and eccentric, beam-column connections.	17	25	45 min
TWT-22			**Hydrology :** Hydrologic cycle, precipitation, evaporation, evapo-transpiration, watershed, infiltration, unit hydrographs, hydrograph analysis, flood estimation and routing, reservoir capacity, reservoir and channel routing, surface run-off models, ground water hydrology - steady state well hydraulics and aquifers; Application of Darcy's law.	17	25	45 min
TWT-23			**Irrigation:** Duty, delta, estimation of evapo-transpiration; Crop water requirements; Design of lined and unlined canals, head works, gravity dams and spillways; Design of weirs on permeable foundation; Types of irrigation systems, irrigation methods; Water logging and drainage; Canal regulatory works, cross-drainage structures, outlets and escapes.	17	25	45 min

TWT-24			**Engineering Mechanics, Construction Materials and Management:** System of forces, free-body diagrams, equilibrium equations; Internal forces in structures; Friction and its applications; Kinematics of point mass and rigid body; Centre of mass; Euler's equations of motion; Impulse-momentum; Energy methods; Principles of virtual work. Construction Materials: Structural steel - composition, material properties and behaviour; Concrete - constituents, mix design, short-term and long-term properties; Bricks and mortar; Timber; Bitumen. Construction Management: Types of construction projects; Tendering and construction contracts; Rate analysis and standard specifications; Cost estimation; Project planning and network analysis - PERT and CPM.	17	25	45 min
Single Subject Tests						
SST-1	15/05/2019	20/02/2020	Solid Mechanics	33	50	90 min
SST-2			Concrete Structures	33	50	90 min
SST-3			Environmental Engineering	33	50	90 min
SST-4			Engineering Mathematics	33	50	90 min
SST-5			Fluid Mechanics and Hydraulics	33	50	90 min
SST-6			General Aptitude	33	50	90 min
SST-7	15/06/2019	20/02/2020	Transportation Engineering and Geomatics Engineering	33	50	90 min
SST-8			Structural Analysis	33	50	90 min
SST-9			Geotechnical Engineering	33	50	90 min
SST-10			Steel Structures	33	50	90 min
SST-11			Hydrology and Irrigation	33	50	90 min
SST-12			Engineering Mechanics, Construction Materials and Management	33	50	90 min
Multiple Subject Tests						
MST-1	15/07/2019	20/02/2020	Solid Mechanics + Structural Analysis + Engineering Mechanics	33	50	90 min
MST-2			Geotechnical Engineering + Steel Structures	33	50	90 min
MST-3			Fluid Mechanics and Hydraulics + Concrete Structures + Construction Materials and Management	33	50	90 min
MST-4			Environmental Engineering + Hydrology + Irrigation	33	50	90 min
MST-5			Transportation Engineering + Geomatics Engineering	33	50	90 min
MST-6			Engineering Mathematics + General Aptitude	33	50	90 min
Full Syllabus Tests						
FST-1	15/08/2019	20/02/2020	Full Syllabus Test-1	65	100	180 min
FST-2			Full Syllabus Test-2	65	100	180 min
FST-3			Full Syllabus Test-3	65	100	180 min
FST-4			Full Syllabus Test-4	65	100	180 min
FST-5	15/09/2019	20/02/2020	Full Syllabus Test-5	65	100	180 min
FST-6			Full Syllabus Test-6	65	100	180 min
FST-7			Full Syllabus Test-7	65	100	180 min
FST-8			Full Syllabus Test-8	65	100	180 min
Candidate has to upload GATE-2020 Admit Card to access below mentioned tests						
GMT-1	**04/01/2020**	**20/02/2020**	GATE Mock Test 1	65	100	180 min
GMT-2			GATE Mock Test 2	65	100	180 min
GMT-3			GATE Mock Test 3	65	100	180 min
GMT-4			GATE Mock Test 4	65	100	180 min

GATE 2019 SCHEDULE: CIVIL ENGINEERING				
Test Type	**Syllabus [EB-Engineering Branch ; EM- Engineering Mathematics; GA- General Aptitude]**	**No. of Question**	**Marks**	**Duration**
Minor Test -1	**EB-Engineering & Solid Mechanics:** **Engineering Mechanics:** System of forces, free-body diagrams, equilibrium equations; Internal forces in structures; Friction and its applications; Kinematics of point mass and rigid body; Centre of mass; Euler's equations of motion; Impulse-momentum; Energy methods; Principles of virtual work. **Solid Mechanics:** Bending moment and shear force in statically determinate beams; Simple stress and strain relationships; Theories of failures; Simple bending theory, flexural and shear stresses, shear centre; Uniform torsion, buckling of column, combined and direct bending stresses.	33	50	90 min
Minor Test - 2	**EB-Structural Analysis:**Statically determinate and indeterminate structures by force/ energy methods; Method of superposition; Analysis of trusses, arches, beams, cables and frames; Displacement methods: Slope deflection and moment distribution methods; Influence lines; Stiffness and flexibility methods of structural analysis.	33	50	90 min
Minor Test - 3	**EM- Linear Algebra:** Matrix algebra; Systems of linear equations; Eigen values and Eigen vectors. **Numerical Methods:** Accuracy and precision; error analysis. Numerical solutions of linear and non-linear algebraic equations; Least square approximation, Newton's and Lagrange polynomials, numerical differentiation, Integration by trapezoidal and Simpson's rule, single and multi-step methods for first order differential equations.	33	50	90 min
GA: Minor Test- 1	**Verbal Ability:** English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction. **Numerical Ability:** Numerical computation, numerical estimation, numerical reasoning and data interpretation.	33	50	90 min
Minor Test - 4	**EB-Concrete Structures:** Working stress, Limit state and Ultimate load design concepts; Design of beams, slabs, columns; Bond and development length; Prestressed concrete; Analysis of beam sections at transfer and service loads.	33	50	90 min

Minor Test - 5	**EB- Construction Materials and Management:** Construction Materials: Structural steel -composition, material properties and behaviour; Concrete - constituents, mix design, short-term and long-term properties; Bricks and mortar; Timber; Bitumen. Construction Management: Types of construction projects; Tendering and construction contracts; Rate analysis and standard specifications; Cost estimation; Project planning and network analysis - PERT and CPM.	33	50	90 min
EM: Minor Test- 1	**LINEAR ALGEBRA:** Matrix algebra; Systems of linear equations; Eigen values and Eigen vectors. **CALCULUS:** Functions of single variable, limit, continuity and differentiability.	33	50	90 min
Minor Test - 6	**GA:** General Aptitude(Language and Analytical Skills)	33	50	90 min
Minor Test - 7	**EB- Steel Structures:** Working stress and Limit state design concepts; Design of tension and compression members, beams and beam- columns, column bases; Connections - simple and eccentric, beam-column connections, plate girders and trusses; Plastic analysis of beams and frames.	33	50	90 min
GA: Minor Test- 2	**Verbal Ability:** English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction. **Numerical Ability:** Numerical computation, numerical estimation, numerical reasoning and data interpretation.	33	50	90 min
Minor Test - 8	**EB-Soil Mechanics:** Origin of soils, soil structure and fabric; Three-phase system and phase relationships, index properties; Unified and Indian standard soil classification system; Permeability - one dimensional flow, Darcy's law; Seepage through soils - two-dimensional flow, flow nets, uplift pressure, piping; Principle of effective stress, capillarity, seepage force and quicksand condition; Compaction in laboratory and field conditions; One-dimensional consolidation, time rate of consolidation; Mohr's circle, stress paths, effective and total shear strength parameters, characteristics of clays and sand.	33	50	90 min
Minor Test - 9	**EM-Calculus:** Functions of single variable, limit, continuity and differentiability. Mean value theorems, local maxima and minima, Taylor and Maclaurin series; Evaluation of definite and indefinite integrals, application of definite integral to obtain area and volume; Partial derivatives; Total derivative; Gradient, Divergence and Curl, Vector identities, Directional derivatives, Line, Surface and Volume integrals, Stokes, Gauss and Green's theorems.	33	50	90 min

EM: Minor Test- 2	**CALCULUS:** Mean value theorems, local maxima and minima, Taylor and Maclaurin series; Evaluation of definite and indefinite integrals, application of definite integral to obtain area and volume; Partial derivatives; Total derivative; Gradient, Divergence and Curl, Vector identities, Directional derivatives, Line, Surface and Volume integrals, Stokes, Gauss and Green's theorems.	33	50	90 min
Minor Test - 10	**EB-Foundation Engineering:** Sub-surface investigations - scope, drilling bore holes, sampling, plate load test, standard penetration and cone penetration tests; Earth pressure theories -Rankine and Coulomb; Stability of slopes - finite and infinite slopes, method of slices and Bishop's method; Stress distribution in soils - Boussinesq's and Westergaard's theories, pressure bulbs; Shallow foundations - Terzaghi's and Meyerhoff's bearing capacity theories, effect of water table; Combined footing and raft foundation; Contact pressure; Settlement analysis in sands and clays; Deep foundations - types of piles, dynamic and static formulae, load capacity of piles in sands and clays, pile load test, negative skin friction.	33	50	90 min
Minor Test -11	**EB-Fluid Mechanics:**Properties of fluids, fluid statics; Continuity, momentum, energy and corresponding equations; Potential flow, applications of momentum and energy equations; Laminar and turbulent flow; Flow in pipes, pipe networks; Concept of boundary layer and its growth.	33	50	90 min
GA: Minor Test- 3	**Verbal Ability:** English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction. **Numerical Ability:** Numerical computation, numerical estimation, numerical reasoning and data interpretation.	33	50	90 min
Minor Test - 12	**GA:** General Aptitude(Language and Analytical Skills)	33	50	90 min
Minor Test - 13	**EB-Hydraulics:** Forces on immersed bodies; Flow measurement in channels and pipes; Dimensional analysis and hydraulic similitude; Kinematics of flow, velocity triangles; Basics of hydraulic machines, specific speed of pumps and turbines; Channel Hydraulics -Energy-depth relationships, specific energy, critical flow, slope profile, hydraulic jump, uniform flow and gradually varied flow.	33	50	90 min

EM: Minor Test- 3	**ORDINARY DIFFERENTIAL EQUATION (ODE):** First order (linear and non-linear) equations; higher order linear equations with constant coefficients; Euler-Cauchy equations; Laplace transform and its application in solving linear ODEs; initial and boundary value problems. **PARTIAL DIFFERENTIAL EQUATION (PDE):** Fourier series; separation of variables; solutions of one-dimensional diffusion equation; first and second order one-dimensional wave equation and two-dimensional Laplace equation.	33	50	90 min
Minor Test -14	**EB-Hydrology & Irrigation:** **Hydrology:** Hydrologic cycle, precipitation, evaporation, evapo-transpiration, watershed, infiltration, unit hydrographs, hydrograph analysis, flood estimation and routing, reservoir capacity, reservoir and channel routing, surface run-off models, ground water hydrology -steady state well hydraulics and aquifers; Application of Darcy's law. **Irrigation:** Duty, delta, estimation of evapo-transpiration; Crop water requirements; Design of lined and unlined canals, head works, gravity dams and spillways; Design of weirs on permeable foundation; Types of irrigation systems, irrigation methods; Water logging and drainage; Canal regulatory works, cross-drainage structures, outlets and escapes.	33	50	90 min
Minor Test - 15	**EM-Ordinary Differential Equation (ODE):** First order (linear and non-linear) equations; higher order linear equations with constant coefficients; Euler-Cauchy equations; Laplace transform and its application in solving linear ODEs; initial and boundary value problems. **Partial Differential Equation (PDE) :** Fourier series; separation of variables; solutions of one-dimensional diffusion equation; first and second order one-dimensional wave equation and two-dimensional Laplace equation.	33	50	90 min

Minor Test - 16	**EB- Waste Water & Pollution :** 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, effluent discharge standards. Domestic wastewater treatment, quantity of characteristics of domestic wastewater, primary and secondary treatment. Unit operations and unit processes of domestic wastewater, sludge disposal. **Air Pollution:** Types of pollutants, their sources and impacts, air pollution meteorology, air pollution control, air quality standards and limits. **Municipal Solid Wastes:** Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse/ recycle, energy recovery, treatment and disposal). Noise Pollution: Impacts of noise, permissible limits of noise pollution, measurement of noise and control of noise pollution.	33	50	90 min
GA: Minor Test- 4	**Verbal Ability:** English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction. **Numerical Ability:** Numerical computation, numerical estimation, numerical reasoning and data interpretation.	33	50	90 min
Minor Test - 17	**EM-Probability and Statistics:** Definitions of probability and sampling theorems; Conditional probability; Discrete Random variables: Poisson and Binomial distributions; Continuous random variables: normal and exponential distributions; Descriptive statistics - Mean, median, mode and standard deviation; Hypothesis testing.	33	50	90 min

Minor Test - 18	**EB-Transportation Engineering:** **Transportation Infrastructure:** Highway alignment and engineering surveys; Geometric design of highways - cross-sectional elements, sight distances, horizontal and vertical alignments; Geometric design of railway track; Airport runway length, taxiway and exit taxiway design. **Highway Pavements:** Highway materials - desirable properties and quality control tests; Design of bituminous paving mixes; Design factors for flexible and rigid pavements; Design of flexible pavement using IRC: 37-2012; Design of rigid pavements using IRC: 58-2011; Distresses in concrete pavements. **Traffic Engineering:** Traffic studies on flow, speed, travel time - delay and O-D study, PCU, peak hour factor, parking study, accident study and analysis, statistical analysis of traffic data; Microscopic and macroscopic parameters of traffic flow, fundamental relationships; Control devices, signal design by Webster's method; Types of intersections and channelization; Highway capacity and level of service of rural highways and urban roads.	33	50	90 min
EM: Minor Test- 4	**NUMERICAL METHODS:** Accuracy and precision; error analysis. Numerical solutions of linear and non-linear algebraic equations; Least square approximation, Newton's and Lagrange polynomials, numerical differentiation, Integration by trapezoidal and Simpson's rule, single and multi-step methods for first order differential equations.	33	50	90 min
Minor Test - 19	**EB- Geomatics Engineering:** Principles of surveying; Errors and their adjustment; Maps - scale, coordinate system; Distance and angle measurement - Levelling and trigonometric levelling; Traversing and triangulation survey; Total station; Horizontal and vertical curves. Photogrammetry - scale, flying height; Remote sensing - basics, platform and sensors, visual image interpretation; Basics of Geographical information system (GIS) and Geographical Positioning system (GPS).	33	50	90 min
Minor Test -20	**GA:** General Aptitude(Language and Analytical Skills)	33	50	90 min
GA: Minor Test- 5	**Verbal Ability:** English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction. **Numerical Ability:** Numerical computation, numerical estimation, numerical reasoning and data interpretation.	33	50	90 min
Major Test - 1	**FULL SYLLABUS**	65	100	180 min
Major Test - 2	**FULL SYLLABUS**	65	100	180 min

EM: Minor Test- 5	**PROBABILITY AND STATISTICS:** Definitions of probability and sampling theorems; Conditional probability; Discrete Random variables: Poisson and Binomial distributions; Continuous random variables: normal and exponential distributions; Descriptive statistics - Mean, median, mode and standard deviation; Hypothesis testing.	33	50	90 min
Major Test - 3	**FULL SYLLABUS**	65	100	180 min
Major Test - 4	**FULL SYLLABUS**	65	100	180 min
Major Test - 5	**FULL SYLLABUS**	65	100	180 min
Major Test - 6	**FULL SYLLABUS**	65	100	180 min
Major Test -7	**FULL SYLLABUS**	65	100	180 min
Major Test - 8	**FULL SYLLABUS**	65	100	180 min
Major Test - 9	**FULL SYLLABUS**	65	100	180 min
Major Test -10	**FULL SYLLABUS**	65	100	180 min