

**Topicwise Tests**

Tests	Test Activation Date	Test Closing Date	Test Syllabus	No. of Ques.	Marks	Timing
TWT-1	15/03/2019	20/02/2020	<b>Strength of Materials-1:</b> Stress and strain, elastic constants, Poisson's ratio; Mohr's circle for plane stress and plane strain; thin cylinders; shear force and bending moment diagrams; bending and shear stresses; deflection of beams.	17	25	45 min
TWT-2			<b>Strength of Materials-2:</b> torsion of circular shafts; Euler's theory of columns; energy methods; thermal stresses; strain gauges and rosettes; testing of materials with universal testing machine; testing of hardness and impact strength.	17	25	45 min
TWT-3			<b>Thermodynamics-1:</b> Thermodynamic systems and processes; properties of pure substances, behaviour of ideal and real gases; zeroth and first laws of thermodynamics, calculation of work and heat in various processes.	17	25	45 min
TWT-4			<b>Thermodynamics-2:</b> second law of thermodynamics; thermodynamic property charts and tables, availability and irreversibility; thermodynamic relations.	17	25	45 min
TWT-5			<b>Fluid Mechanics &amp; Hydraulic Machines-1:</b> Fluid properties; fluid statics, manometry, buoyancy, forces on submerged bodies, stability of floating bodies; control-volume analysis of mass, momentum and energy; fluid acceleration; differential equations of continuity and momentum.	17	25	45 min
TWT-6			<b>Fluid Mechanics &amp; Hydraulic Machines-2:</b> Bernoulli's equation; dimensional analysis; viscous flow of incompressible fluids, boundary layer, elementary turbulent flow, flow through pipes, head losses in pipes, bends and fittings; Impulse and reaction principles, velocity diagrams, Pelton-wheel, Francis and Kaplan turbines.	17	25	45 min
TWT-7			<b>Theory of Machines-1:</b> Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of linkages; cams; Free and forced vibration of single degree of freedom systems.	17	25	45 min
TWT-8			<b>Theory of Machines-2:</b> Gears and gear trains; flywheels and governors; balancing of reciprocating and rotating masses; gyroscope; effect of damping; vibration isolation; resonance; critical speeds of shafts.	17	25	45 min
TWT-9			<b>Engineering mathematics-1:</b> Linear Algebra, Calculus, Vector Analysis, Probability and Statistics.	17	25	45 min
TWT-10			<b>Engineering mathematics-2:</b> Differential Equations, Complex Analysis, Numerical Methods.	17	25	45 min
TWT-11			<b>General Aptitude-1:</b> Numerical Ability: Numerical computation, numerical estimation, numerical reasoning and data interpretation.	17	25	45 min
TWT-12			<b>General Aptitude-2:</b> Verbal Ability: English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction.	17	25	45 min
TWT-13			<b>Heat Transfer-1:</b> Modes of heat transfer; one dimensional heat conduction, resistance concept and electrical analogy, heat transfer through fins; unsteady heat conduction, lumped parameter system, Heisler's charts; thermal boundary layer, dimensionless parameters in free and forced convective heat transfer, heat transfer correlations for flow over flat plates and through pipes, effect of turbulence.	17	25	45 min
TWT-14			<b>Heat Transfer-2:</b> Heat exchanger performance, LMTD and NTU methods; radiative heat transfer, Stefan-Boltzmann law, Wien's displacement law, black and grey surfaces, view factors, radiation network analysis.	17	25	45 min
TWT-15			<b>Engineering Mechanics and Engineering Materials-1:</b> Free-body diagrams and equilibrium; trusses and frames; virtual work; Structure and properties of engineering materials, phase diagrams	17	25	45 min
TWT-16			<b>Engineering Mechanics and Engineering Materials-2:</b> Kinematics and dynamics of particles and of rigid bodies in plane motion; impulse and momentum (linear and angular) and energy formulations, collisions; heat treatment, stress-strain diagrams for engineering materials.	17	25	45 min
TWT-17			<b>Manufacturing Engineering-1:</b> Different types of castings, design of patterns, moulds and cores; solidification and cooling; riser and gating design. Plastic deformation and yield criteria; fundamentals of hot and cold working processes; load estimation for bulk (forging, rolling, extrusion, drawing) and sheet (shearing, deep drawing, bending) metal forming processes; principles of powder metallurgy. Principles of welding, brazing, soldering and adhesive bonding. Basic concepts of CAD/CAM and their integration tools.	17	25	45 min

TWT-18	15/04/2019	20/02/2020	<b>Manufacturing Engineering-2:</b> Mechanics of machining; basic machine tools; single and multi-point cutting tools, tool geometry and materials, tool life and wear; economics of machining; principles of non-traditional machining processes; principles of work holding, design of jigs and fixtures. Limits, fits and tolerances; linear and angular measurements; comparators; gauge design; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly.	17	25	45 min
TWT-19			<b>I.C Engine &amp; Power Plant:</b> Air and gas compressors; vapour and gas power cycles, concepts of regeneration and reheat. Air-standard Otto, Diesel and dual cycles.	17	25	45 min
TWT-20			<b>Refrigeration &amp; Air-Conditioning :</b> Vapour and gas refrigeration and heat pump cycles; properties of moist air, psychrometric chart, basic psychrometric processes.	17	25	45 min
TWT-21			<b>Industrial Engineering-1:</b> Forecasting models, aggregate production planning, scheduling, materials requirement planning.	17	25	45 min
TWT-22			<b>Industrial Engineering-2:</b> Deterministic models; safety stock inventory control systems; linear programming, simplex method, transportation, assignment, network flow models, simple queuing models, PERT and CPM.	17	25	45 min
TWT-23			<b>Machine Design-1:</b> Design for static and dynamic loading; failure theories; fatigue strength and the S-N diagram.	17	25	45 min
TWT-24			<b>Machine Design-2:</b> Principles of the design of machine elements such as bolted, riveted and welded joints; shafts, gears, rolling and sliding contact bearings, brakes and clutches, springs.	17	25	45 min

### Single Subject Tests

SST-1	15/05/2019	20/02/2020	Strength of Materials	33	50	90 min
SST-2			Thermodynamics	33	50	90 min
SST-3			Fluid Mechanics & Hydraulic Machines	33	50	90 min
SST-4			Theory of Machines	33	50	90 min
SST-5			Engineering Mathematics	33	50	90 min
SST-6			General Aptitude	33	50	90 min
SST-7	15/06/2019	20/02/2020	Heat Transfer	33	50	90 min
SST-8			Engineering Mechanics and Engineering Materials	33	50	90 min
SST-9			Manufacturing Engineering	33	50	90 min
SST-10			I.C Engine, Power Plant, Refrigeration & Air-Conditioning	33	50	90 min
SST-11			Industrial Engineering	33	50	90 min
SST-12			Machine Design	33	50	90 min

### Multiple Subject Tests

MST-1	15/07/2019	20/02/2020	Engineering Mechanics and Engineering Materials + Theory of Machines	33	50	90 min
MST-2			Strength of Materials + Machine Design	33	50	90 min
MST-3			Thermodynamics + Fluid Mechanics & Hydraulic Machines	33	50	90 min
MST-4			Manufacturing Engineering + Heat Transfer	33	50	90 min
MST-5			Industrial Engineering + I.C Engine, Power Plant, Refrigeration & Air-Conditioning	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: MECHANICAL ENGINEERING**

Test Type	Syllabus [ EB-Engineering Branch ; EM- Engineering Mathematics; GA- General Aptitude]	No. of Question	Marks	Duration
Minor Test - 1	<b>EB-Engineering Mechanics:</b> Free body diagrams and equilibrium; trusses and frames; virtual work; kinematics and dynamics of particles and of rigid bodies in plane motion, including impulse and momentum (linear and angular) and energy formulations; impact.	33	50	90 min
Minor Test - 2	<b>EB-Strength of Materials-I:</b> Stress and strain, stress-strain relationship and elastic constants, Mohr's circle for plane stress and plane strain, thin cylinders; shear force and bending moment diagrams;	33	50	90 min
Minor Test - 3	<b>EM- Linear Algebra:</b> Matrix algebra, systems of linear equations, eigenvalues and eigenvectors. <b>Numerical Methods:</b> Numerical solutions of linear and non-linear algebraic equations; integration by trapezoidal and Simpson's rules; single and multi-step methods for differential equations.	33	50	90 min
<b>GA: Minor Test- 1</b>	<b>Verbal Ability:</b> English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction. <b>Numerical Ability:</b> Numerical computation, numerical estimation, numerical reasoning and data interpretation.	33	50	90 min
Minor Test - 4	<b>EB-Strength of Materials-II:</b> Bending and shear stresses; deflection of beams; torsion of circular shafts; Euler's theory of columns; strain energy methods;thermal stresses.	33	50	90 min
Minor Test - 5	<b>EB-Theory Of Machines and Vibrations:</b> Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of slider-crank mechanism; gear trains; flywheels. <b>Vibration:</b> Free and forced vibration of single degree of freedom systems; effect of damping; vibration isolation; resonance, critical speeds of shafts.	33	50	90 min
<b>EM: Minor Test- 1</b>	<b>LINEAR ALGEBRA:</b> Matrix algebra, systems of linear equations, eigenvalues and eigenvectors. <b>CALCULUS:</b> Functions of single variable, limit, continuity and differentiability.	33	50	90 min
Minor Test - 6	<b>GA:</b> General Aptitude( Language and Analytical Skills)	33	50	90 min
Minor Test - 7	<b>EB-Machine Design:</b> Design for static and dynamic loading; failure theories; fatigue strength and the S-N diagram; principles of the design of machine elements such as bolted, riveted and welded joints, shafts, spur gears, rolling and sliding contact bearings, brakes and clutches.	33	50	90 min

<b>GA: Minor Test- 2</b>	<p><b>Verbal Ability:</b> English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction.</p> <p><b>Numerical Ability:</b> Numerical computation, numerical estimation, numerical reasoning and data interpretation.</p>	33	50	90 min
Minor Test - 8	<p><b>EB-Fluid Mechanics-I</b> Fluid properties; fluid statics, manometry, buoyancy; control-volume analysis of mass, momentum and energy; fluid acceleration; differential equations of continuity and momentum; Bernoulli's equation.</p>	33	50	90 min
Minor Test - 9	<p><b>EM-Calculus:</b> Functions of single variable, limit, continuity and differentiability. Mean value theorems, indeterminate forms; evaluation of definite and improper integrals; double and triple integrals; partial derivatives, total derivative, Taylor series (in one and two variables), maxima and minima, Fourier series; gradient, divergence and curl, vector identities, directional derivatives, line, surface and volume integrals, applications of Gauss, Stokes and Green's theorems.</p>	33	50	90 min
<b>EM: Minor Test- 2</b>	<p><b>CALCULUS:</b> Mean value theorems, indeterminate forms; evaluation of definite and improper integrals; double and triple integrals; partial derivatives, total derivative, Taylor series (in one and two variables), maxima and minima, Fourier series; gradient, divergence and curl, vector identities, directional derivatives, line, surface and volume integrals, applications of Gauss, Stokes and Green's theorems.</p>	33	50	90 min
Minor Test - 10	<p><b>EB-Fluid Mechanics-II and Turbo-Machinery</b> Viscous flow of incompressible fluids; boundary layer; elementary turbulent flow; flow through pipes, head losses in pipes, bends etc. Pelton-wheel, Francis and Kaplan turbines-impulse and reaction principles, velocity diagrams.</p>	33	50	90 min
Minor Test -11	<p><b>EB-Heat-Transfer</b> Modes of heat transfer; one dimensional heat conduction, resistance concept, electrical analogy, unsteady heat conduction, fins; dimensionless parameters in free and forced convective heat transfer, various correlations for heat transfer in flow over flat plates and through pipes; thermal boundary layer; effect of turbulence; radiative heat transfer, black and grey surfaces, shape factors, network analysis; heat exchanger performance, LMTD and NTU methods.</p>	33	50	90 min
<b>GA: Minor Test- 3</b>	<p><b>Verbal Ability:</b> English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction.</p> <p><b>Numerical Ability:</b> Numerical computation, numerical estimation, numerical reasoning and data interpretation.</p>	33	50	90 min
Minor Test - 12	<b>GA: General Aptitude( Language and Analytical Skills)</b>	33	50	90 min

Minor Test - 13	<p><b>EB-Thermodynamics</b> Zeroth, First and Second laws of thermodynamics; thermodynamic system and processes; Carnot cycle. irreversibility and availability; behaviour of ideal and real gases, properties of pure substances, calculation of work and heat in ideal processes; analysis of thermodynamic cycles related to energy conversion.</p>	33	50	90 min
<b>EM: Minor Test- 3</b>	<p><b>DIFFERENTIAL EQUATIONS:</b> First order equations (linear and nonlinear); higher order linear differential equations with constant coefficients; Euler-Cauchy equation; initial and boundary value problems; Laplace transforms; solutions of heat, wave and Laplace's equations.</p>	33	50	90 min
Minor Test -14	<p><b>EB- Thermodynamics-Applications</b> Power Engineering: Steam Tables, Rankine, Brayton cycles with regeneration and reheat. I.C. Engines: air-standard Otto, Diesel cycles. Refrigeration and air-conditioning: Vapour refrigeration cycle, heat pumps, gas refrigeration, Reverse Brayton cycle; moist air: psychrometric chart, basic psychrometric processes.</p>	33	50	90 min
Minor Test - 15	<p><b>EM-Differential equations:</b> First order equations (linear and nonlinear); higher order linear differential equations with constant coefficients; Euler-Cauchy equation; initial and boundary value problems; Laplace transforms; solutions of heat, wave and Laplace's equations. <b>Complex variables:</b> Analytic functions; Cauchy-Riemann equations; Cauchy's integral theorem and integral formula; Taylor and Laurent series.</p>	33	50	90 min
Minor Test - 16	<p><b>EB-Manufacturing Science-I</b> <b>Engineering Materials:</b> Structure and properties of engineering materials, heat treatment, stress-strain diagrams for engineering materials. <b>Metal Casting:</b> Design of patterns, moulds and cores; solidification and cooling; riser and gating design, design considerations. <b>Forming:</b> Plastic deformation and yield criteria; fundamentals of hot and cold working processes; load estimation for bulk (forging, rolling, extrusion, drawing) and sheet (shearing, deep drawing, bending) metal forming processes; principles of powder metallurgy. <b>Joining:</b> Physics of welding, brazing and soldering; adhesive bonding; design considerations in welding.</p>	33	50	90 min

<b>GA: Minor Test- 4</b>	<p><b>Verbal Ability:</b> English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction.</p> <p><b>Numerical Ability:</b> Numerical computation, numerical estimation, numerical reasoning and data interpretation.</p>	33	50	90 min
Minor Test - 17	<p><b>EM-Probability and Statistics:</b> Definitions of probability, sampling theorems, conditional probability; mean, median, mode and standard deviation; random variables, binomial, Poisson and normal distributions.</p>	33	50	90 min
Minor Test - 18	<p><b>EB-Manufacturing Science-II</b></p> <p><b>Machining and Machine Tool Operations:</b> Mechanics of machining, single and multi-point cutting tools, tool geometry and materials, tool life and wear; economics of machining; principles of non-traditional machining processes; principles of work holding, principles of design of jigs and fixtures</p> <p><b>Metrology and Inspection:</b> Limits, fits and tolerances; linear and angular measurements; comparators; gauge design; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly.</p> <p><b>Computer Integrated Manufacturing:</b> Basic concepts of CAD/CAM and their integration tools.</p>	33	50	90 min
<b>EM: Minor Test- 4</b>	<p><b>COMPLEX VARIABLES:</b> Analytic functions; Cauchy-Riemann equations; Cauchy's integral theorem and integral formula; Taylor and Laurent series.</p> <p><b>NUMERICAL METHODS:</b> Numerical solutions of linear and non-linear algebraic equations; integration by trapezoidal and Simpson's rules; single and multi-step methods for differential equations.</p>	33	50	90 min

Minor Test - 19	<p><b>EB-Industrial Engineering</b>  <b>Production Planning and Control:</b> Forecasting models, aggregate production planning, scheduling, materials requirement planning.  <b>Inventory Control:</b> Deterministic and probabilistic models; safety stock inventory control systems.  <b>Operations Research:</b> Linear programming, simplex and duplex method, transportation, assignment, network flow models, simple queuing models, PERT and CPM.</p>	33	50	90 min
Minor Test -20	<b>GA:</b> General Aptitude( Language and Analytical Skills)	33	50	90 min
<b>GA: Minor Test- 5</b>	<p><b>Verbal Ability:</b> English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction.  <b>Numerical Ability:</b> Numerical computation, numerical estimation, numerical reasoning and data interpretation.</p>	33	50	90 min
Major Test - 1	<b>FULL SYLLABUS</b>	65	100	180 min
Major Test - 2	<b>FULL SYLLABUS</b>	65	100	180 min
<b>EM: Minor Test- 5</b>	<b>PROBABILITY AND STATISTICS:</b> Definitions of probability, sampling theorems, conditional probability; mean, median, mode and standard deviation; random variables, binomial, Poisson and normal distributions.	33	50	90 min
Major Test - 3	<b>FULL SYLLABUS</b>	65	100	180 min
Major Test - 4	<b>FULL SYLLABUS</b>	65	100	180 min
Major Test - 5	<b>FULL SYLLABUS</b>	65	100	180 min
Major Test - 6	<b>FULL SYLLABUS</b>	65	100	180 min
Major Test -7	<b>FULL SYLLABUS</b>	65	100	180 min
Major Test - 8	<b>FULL SYLLABUS</b>	65	100	180 min
Major Test - 9	<b>FULL SYLLABUS</b>	65	100	180 min
Major Test -10	<b>FULL SYLLABUS</b>	65	100	180 min