

**SUBJECT AND MOCK TEST SERIES**

**GATE 2019 SCHEDULE: MECHANICAL ENGINEERING**

Test Date	Test Type	Syllabus [ EB-Engineering Branch ; EM- Engineering Mathematics; GA- General Aptitude]	No. of Question	Marks	Duration
01/07/2018	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
08/07/2018	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
15/07/2018	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
22/07/2018	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
29/07/2018	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
05/08/2018	Minor Test - 6	<b>GA:</b> General Aptitude( Language and Analytical Skills)	33	50	90 min
12/08/2018	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
19/08/2018	Minor Test - 8	<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.	33	50	90 min

26/08/2018	Minor Test - 9	<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.	33	50	90 min
02/09/2018	Minor Test - 10	<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.	33	50	90 min
09/09/2018	Minor Test -11	<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.	33	50	90 min
16/09/2018	Minor Test - 12	<b>GA:</b> General Aptitude( Language and Analytical Skills)	33	50	90 min
23/09/2018	Minor Test - 13	<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.	33	50	90 min
30/09/2018	Minor Test -14	<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.	33	50	90 min
07/10/2018	Minor Test - 15	<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.	33	50	90 min

14/10/2018	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
21/10/2018	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
28/10/2018	Minor Test - 18	<p><b>EB-Manufacturing Science-II</b>  <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  <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.  <b>Computer Integrated Manufacturing:</b> Basic concepts of CAD/CAM and their integration tools.</p>	33	50	90 min
04/11/2018	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
11/11/2018	Minor Test -20	<p><b>GA:</b> General Aptitude( Language and Analytical Skills)</p>	33	50	90 min

18/11/2018	Major Test - 1	<b>FULL SYLLABUS</b>	65	100	180 min
25/11/2018	Major Test - 2	<b>FULL SYLLABUS</b>	65	100	180 min
02/12/2018	Major Test - 3	<b>FULL SYLLABUS</b>	65	100	180 min
09/12/2018	Major Test - 4	<b>FULL SYLLABUS</b>	65	100	180 min
16/12/2018	Major Test - 5	<b>FULL SYLLABUS</b>	65	100	180 min
30/12/2018	Major Test - 6	<b>FULL SYLLABUS</b>	65	100	180 min
06/01/2019	Major Test -7	<b>FULL SYLLABUS</b>	65	100	180 min
13/01/2019	Major Test - 8	<b>FULL SYLLABUS</b>	65	100	180 min
20/01/2019	Major Test - 9	<b>FULL SYLLABUS</b>	65	100	180 min
27/01/2019	Major Test -10	<b>FULL SYLLABUS</b>	65	100	180 min

**NOTE:**

1. The above mentioned Dates are Opening Dates for Tests and each Test is valid till March 2019.