

**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>Networks-1:</b> Network solution methods: nodal and mesh analysis, Wye-Delta transformation. Network theorems: superposition, Thevenin and Norton's, maximum power transfer. Steady state sinusoidal analysis using phasors.	17	25	45 min
TWT-2			<b>Networks-2:</b> Frequency domain analysis of RLC circuits. Time domain analysis of simple linear circuits. Solution of network equations using Laplace transform. Linear 2-port network parameters: driving point and transfer functions.	17	25	45 min
TWT-3			<b>Control Systems-1:</b> Basic control system components, feedback principle, transfer function, block diagram representation, signal flow graph. Transient and steady-state analysis of LTI systems. Routh-Hurwitz; Root-locus plots.	17	25	45 min
TWT-4			<b>Control Systems-2:</b> Frequency response, Nyquist stability criteria and Bode plot. Lag, lead and lag-lead compensation, PID controllers. State variable model and solution of state equation of LTI systems.	17	25	45 min
TWT-5			<b>Electronic Devices-1:</b> Energy bands in intrinsic and extrinsic silicon, Carrier transport: diffusion current, drift current, mobility and resistivity. Generation and recombination of carriers. Poisson and continuity equations. P-N junction, Zener diode.	17	25	45 min
TWT-6			<b>Electronic Devices-2:</b> BJT, MOS capacitor, MOSFET, LED, photo diode and solar cell. Integrated circuit fabrication process: oxidation, diffusion, ion implantation, photolithography and twin-tub CMOS process.	17	25	45 min
TWT-7			<b>Analog Circuits-1:</b> Small signal equivalent circuits of diodes. Simple diode circuits: clipping, clamping and rectifiers. Biasing, bias stability of BJTs and MOSFETs.	17	25	45 min
TWT-8			<b>Analog Circuits-2 :</b> Small signal equivalent circuits of BJTs and MOSFETs, single-stage BJT and MOSFET amplifiers, mid-frequency small signal analysis. Frequency response of BJT and MOSFET amplifiers. Multi-stage, differential, feedback and power amplifiers.	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>Analog Circuits-3:</b> Operational amplifiers: Simple op-amp circuits, active filters. Sinusoidal oscillators: criterion for oscillation, single-transistor and op-amp configurations. Function generators, wave-shaping circuits and 555 timers. Voltage reference circuits; Power supplies: ripple removal and regulation.	17	25	45 min
TWT-14			<b>Microprocessors:</b> Semiconductor memories: ROM, SRAM, DRAM; 8-bit microprocessor (8085): architecture, programming, memory and I/O interfacing.	17	25	45 min
TWT-15			<b>Digital Circuits-1:</b> Number systems; Combinatorial circuits: Boolean algebra, minimization of functions using Boolean identities and Karnaugh map, logic gates and their static CMOS implementations, arithmetic circuits, code converters, multiplexers, decoders.	17	25	45 min
TWT-16			<b>Digital Circuits-2:</b> Programmable logic devices. Sequential circuits: latches and flip-flops, counters, shift-registers and finite state machines. Data converters: sample and hold circuits, ADCs and DACs.	17	25	45 min

TWT-17	15/04/2019	20/02/2020	<b>Signals and Systems-1:</b> Continuous-time signals: Fourier series and Fourier transform representations, sampling theorem and applications. Continuous LTI systems: definition and properties, causality, stability, impulse response, convolution, poles and zeros, parallel and cascade structures, frequency response, group delay, phase delay.	17	25	45 min
TWT-18			<b>Signals and Systems-2:</b> Discrete-time signals: discrete-time Fourier transform (DTFT), DFT, FFT, Z-transform, interpolation of discrete-time signals. Discrete LTI systems: definition and properties, causality, stability, impulse response, convolution, poles and zeros, parallel and cascade structures, digital filter design techniques.	17	25	45 min
TWT-19			<b>Communications-1:</b> Analog communications: amplitude modulation and demodulation, angle modulation and demodulation, spectra of AM and FM, superheterodyne receivers, circuits for analog communications.	17	25	45 min
TWT-20			<b>Communications-2:</b> Random processes: autocorrelation and power spectral density, properties of white noise, filtering of random signals through LTI systems. Information theory: entropy, mutual information and channel capacity theorem.	17	25	45 min
TWT-21			<b>Communications-3:</b> Digital communications: PCM, DPCM, digital modulation schemes, amplitude, phase and frequency shift keying (ASK, PSK, FSK), QAM, MAP and ML decoding, matched filter receiver, calculation of bandwidth, SNR and BER for digital modulation; Fundamentals of error correction, Hamming codes; Timing and frequency synchronization, inter-symbol interference and its mitigation; Basics of TDMA, FDMA and CDMA.	17	25	45 min
TWT-22			<b>Electromagnetics-1:</b> Electrostatics; Maxwell's equations: differential and integral forms and their interpretation, boundary conditions, wave equation, Poynting vector.	17	25	45 min
TWT-23			<b>Electromagnetics-2:</b> Plane waves and properties: reflection and refraction, polarization, phase and group velocity, propagation through various media, skin depth. Waveguides: modes, boundary conditions, cut-off frequencies, dispersion relations.	17	25	45 min
TWT-24			<b>Electromagnetics-3:</b> Transmission lines: equations, characteristic impedance, impedance matching, impedance transformation, S-parameters, Smith chart. Antennas: antenna types, radiation pattern, gain and directivity, return loss, antenna arrays. Basics of radar; Light propagation in optical fibers.	17	25	45 min
<b>Single Subject Tests</b>						
SST-1	15/05/2019	20/02/2020	Networks	33	50	90 min
SST-2			Control Systems	33	50	90 min
SST-3			Electronic Devices	33	50	90 min
SST-4			Analog Circuits	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	Signals & Systems	33	50	90 min
SST-8			Analog Communication Systems	33	50	90 min
SST-9			Digital Communication Systems	33	50	90 min
SST-10			Digital Circuits	33	50	90 min
SST-11			Electromagnetics	33	50	90 min
SST-12			Microprocessors	33	50	90 min
<b>Multiple Subject Tests</b>						
MST-1	15/07/2019	20/02/2020	Networks + Control Systems	33	50	90 min
MST-2			Electronic Devices + Analog Circuits	33	50	90 min
MST-3			Digital Circuits + Microprocessors	33	50	90 min
MST-4			Communications	33	50	90 min
MST-5			Electromagnetics + Signals & Systems	33	50	90 min
MST-6			Engineering Mathematics + General Aptitude	33	50	90 min
<b>Full Syllabus Tests</b>						
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	15/09/2019	20/02/2020	Full Syllabus Test-3	65	100	180 min
FST-4			Full Syllabus Test-4	65	100	180 min
FST-5			Full Syllabus Test-5	65	100	180 min
FST-6	15/09/2019	20/02/2020	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
<b>Candidate has to upload GATE-2020 Admit Card to access below mentioned tests</b>						
GMT-1			GATE Mock Test 1	65	100	180 min
GMT-2	04/01/2020	20/02/2020	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: ELECTRONICS & COMMUNICATION ENGINEERING**

Test Type	Syllabus [ EB-Engineering Branch ; EM- Engineering Mathematics; GA- General Aptitude]	No. of Question	Marks	Duration
Minor Test -1	<b>EB-Networks –I:</b> Network Solution methods; nodal and mesh analysis; Network theorems: superposition, Thevenin and Norton's, maximum power transfer; Wye-Delta transformation.	33	50	90 min
Minor Test - 2	<b>EB-Networks –II:</b> Steady state sinusoidal analysis using phasors; Time domain analysis of simple linear circuits; Solution of network equations using Laplace transform; Frequency domain analysis of RLC circuits; Linear 2-port network parameters: driving point and transfer functions; State equations for networks..	33	50	90 min
Minor Test - 3	<b>EM- Linear Algebra:</b> Vector space, basis, linear dependence and independence, matrix algebra, eigen values and eigen vectors, rank, solution of linear equations - existence and uniqueness. <b>Numerical Methods:</b> Solution of nonlinear equations, single and multi-step methods for differential equations, convergence criteria.	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- Signals &amp; Systems - I:</b> Continuous-time signals: Fourier series and Fourier transform representations, sampling theorem and applications; Discrete-time signals: discrete-time Fourier transform (DTFT), DFT, FFT, Z-transform, interpolation of discrete-time signals.	33	50	90 min
Minor Test - 5	<b>EB- Signals &amp; Systems - II:</b> LTI systems: definition and properties, causality, stability, impulse response, convolution, poles and zeros, parallel and cascade structure, frequency response, group delay, phase delay, digital filter design techniques.	33	50	90 min
<b>EM: Minor Test- 1</b>	<b>LINEAR ALGEBRA:</b> Vector space, basis, linear dependence and independence, matrix algebra, eigen values and eigen vectors, rank, solution of linear equations - existence and uniqueness.	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- Electronic Devices :</b> Energy bands in intrinsic and extrinsic silicon; Carrier transport: diffusion current, drift current, mobility and resistivity; Generation and recombination of carriers; Poisson and continuity equations; P-N junction, Zener diode, BJT, MOS capacitor, MOSFET, LED, photo diode and solar cell; Integrated circuit fabrication process: oxidation, diffusion, ion implantation, photolithography and twin-tub CMOS process.	33	50	90 min
<b>GA: Minor Test- 2</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 - 8	<b>EB- Analog Circuits -I:</b> Small signal equivalent circuits of diodes, BJTs and MOSFETs; Simple diode circuits: clipping, clamping and rectifiers; Singlestage BJT and MOSFET amplifiers: biasing, bias stability, mid-frequency small signal analysis and frequency response; BJT and MOSFET amplifiers: multi-stage, differential, feedback, power and operational.	33	50	90 min
Minor Test - 9	<b>EM-Calculus:</b> Mean value theorems, theorems of integral calculus, evaluation of definite and improper integrals, partial derivatives, maxima and minima, multiple integrals, line, surface and volume integrals, Taylor series. <b>Vector Analysis:</b> Vectors in plane and space, vector operations, gradient, divergence and curl, Gauss's, Green's and Stoke's theorems.	33	50	90 min
<b>EM: Minor Test- 2</b>	<b>CALCULUS:</b> Mean value theorems, theorems of integral calculus, evaluation of definite and improper integrals, partial derivatives, maxima and minima, multiple integrals, line, surface and volume integrals, Taylor series. <b>VECTOR ANALYSIS:</b> Vectors in plane and space, vector operations, gradient, divergence and curl, Gauss's, Green's and Stoke's theorems.	33	50	90 min
Minor Test - 10	<b>EB- Analog Circuits -II:</b> Simple op-amp circuits; Active filters; Sinusoidal oscillators: criterion for oscillation, single-transistor and op-amp configurations; Function generators, wave-shaping circuits and 555 timers; Voltage reference circuits; Power supplies: ripple removal and regulation.	33	50	90 min

Minor Test -11	<b>EB- Digital Circuits:</b> Number systems; Combinatorial circuits: Boolean algebra, minimization of functions using Boolean identities and Karnaugh map, logic gates and their static CMOS implementations, arithmetic circuits, code converters, multiplexers, decoders and PLAs; Sequential circuits: latches and flip-flops, counters, shift registers and finite state machines; Data converters: sample and hold circuits, ADCs and DACs; Semiconductor memories: ROM, SRAM, DRAM; 8-bit microprocessor (8085): architecture, programming, memory and I/O interfacing.	33	50	90 min
<b>GA: Minor Test- 3</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 - 12	<b>GA:</b> General Aptitude( Language and Analytical Skills)	33	50	90 min
Minor Test - 13	<b>EB- Control Systems –I :</b> Basic control system components; Feedback principle; Transfer function; Block diagram representation; Signal flow graph; Transient and steady-state analysis of LTI systems; Frequency response..	33	50	90 min
<b>EM: Minor Test- 3</b>	<b>DIFFERENTIAL EQUATIONS:</b> First order equations (linear and nonlinear), higher order linear differential equations, Cauchy's and Euler's equations, methods of solution using variation of parameters, complementary function and particular integral, partial differential equations, variable separable method, initial and boundary value problems.	33	50	90 min
Minor Test -14	<b>EB- Control Systems –II :</b> Routh-Hurwitz and Nyquist stability criteria; Bode and root-locus plots; Lag, lead and lag-lead compensation; State variable model and solution of state equation of LTI systems.	33	50	90 min
Minor Test - 15	<b>EM-Differential Equations:</b> First order equations (linear and nonlinear), higher order linear differential equations, Cauchy's and Euler's equations, methods of solution using variation of parameters, complementary function and particular integral, partial differential equations, variable separable method, initial and boundary value problems. <b>Complex Analysis:</b> Analytic functions, Cauchy's integral theorem, Cauchy's integral formula; Taylor's and Laurent's series, residue theorem.	33	50	90 min

Minor Test - 16	<b>EB- Communications –I</b> : Random processes: autocorrelation and power spectral density, properties of white noise, filtering of random signals through LTI systems; Analog communications: amplitude modulation and demodulation, angle modulation and demodulation, spectra of AM and FM, superheterodyne receivers, circuits for analog communications; Information theory: entropy, mutual information and channel capacity theorem	33	50	90 min
<b>GA: Minor Test- 4</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 - 17	<b>EM-Probability and Statistics:</b> Mean, median, mode and standard deviation; combinatorial probability, probability distribution functions - binomial, Poisson, exponential and normal; Joint and conditional probability; Correlation and regression analysis.	33	50	90 min
Minor Test - 18	<b>EB- Communications –II</b> : Digital communications: PCM, DPCM, digital modulation schemes, amplitude, phase and frequency shift keying (ASK, PSK, FSK), QAM, MAP and ML decoding, matched filter receiver, calculation of bandwidth, SNR and BER for digital modulation; Fundamentals of error correction, Hamming codes; Timing and frequency synchronization, inter-symbol interference and its mitigation; Basics of TDMA, FDMA and CDMA.	33	50	90 min
<b>EM: Minor Test- 4</b>	<b>COMPLEX ANALYSIS:</b> Analytic functions, Cauchy's integral theorem, Cauchy's integral formula; Taylor's and Laurent's series, residue theorem. <b>NUMERICAL METHODS:</b> Solution of nonlinear equations, single and multi-step methods for differential equations, convergence criteria.	33	50	90 min
Minor Test - 19	<b>EB- Electromagnetics: Electrostatics;</b> Maxwell's equations: differential and integral forms and their interpretation, boundary conditions, wave equation, Poynting vector; Plane waves and properties: reflection and refraction, polarization, phase and group velocity, propagation through various media, skin depth; Transmission lines: equations, characteristic impedance, impedance matching, impedance transformation, S-parameters, Smith chart; Waveguides: modes, boundary conditions, cut-off frequencies, dispersion relations; Antennas: antenna types, radiation pattern, gain and directivity, return loss, antenna arrays; Basics of radar; Light propagation in optical fibers.	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>	<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
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> Mean, median, mode and standard deviation; combinatorial probability, probability distribution functions - binomial, Poisson, exponential and normal; Joint and conditional probability; Correlation and regression analysis.	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

**NOTE:**

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