

## TOPIC WISE TESTS

- Each test carries 25 marks and 45 minutes duration
- Test consists of 5 one mark questions and 10 two marks questions

TEST No	TEST NAME : SYLLABUS	DATE OF ACTIVATION
IN-01	<b>Basic Level Electrical Circuits – 1:</b> Voltage and current sources: independent, dependent, ideal and practical; v-i relationships of resistor, inductor, mutual inductor and capacitor Kirchhoff's laws, mesh and nodal analysis, superposition, Thevenin, Norton, maximum power transfer and reciprocity theorems.	Available Now
IN -02	<b>Basic Level Electrical Circuits – 2:</b> Transient analysis of RLC circuits with dc excitation. Peak-, average- and rms values of ac quantities; apparent-, active- and reactive powers; phasor analysis, impedance and admittance; series and parallel resonance, locus diagrams, realization of basic filters with R, L and C elements. One-port and two-port networks, driving point impedance and admittance, open-, and short circuit parameters.	Available Now
IN -03	<b>Basic Level Sensors and Industrial Inst. – 1:</b> Resistive-, capacitive-, inductive-, piezoelectric-, Hall effect sensors and associated signal conditioning circuits; transducers for industrial instrumentation: displacement (linear and angular), velocity, acceleration, force, torque, vibration, shock, pressure (including low pressure)	Available Now
IN-04	<b>Basic Level Sensors and Industrial Inst. – 2:</b> Flow (differential pressure, variable area, electromagnetic, ultrasonic, turbine and open channel flow meters) temperature (thermocouple, bolometer, RTD (3/4 wire), thermistor, pyrometer and semiconductor); liquid level, pH, conductivity and viscosity measurement.	Available Now
IN-05	<b>Basic Level Signals and Systems – 1:</b> Continuous-time signals: Fourier series and Fourier transform representations, sampling theorem and applications; Discrete-time signals: discrete-time Fourier transform (DTFT), DFT, FFT	Available Now
IN-06	<b>Basic Level Signals and Systems – 2:</b> Z-transform, interpolation of discrete-time signals; 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.	Available Now
IN-07	<b>Basic Level Measurements – 1:</b> SI units, systematic and random errors in measurement, expression of uncertainty - accuracy and precision index, propagation of errors. PMMC, MI and dynamometer type instruments; dc potentiometer; bridges for measurement of R, L and C, Q-meter.	Available Now
IN-08	<b>Basic Level Measurements – 2:</b> Measurement of voltage, current and power in single and three phase circuits; ac and dc current probes; true rms meters, voltage and current scaling, instrument transformers, timer/counter, time, phase and frequency measurements, digital voltmeter, digital multimeter; oscilloscope, shielding and grounding.	Available Now

TEST No	TEST NAME : SYLLABUS	DATE OF ACTIVATION
IN-09	<b>Basic Level Communication and Optical Inst. – 1:</b> Amplitude- and frequency modulation and demodulation; Shannon's sampling theorem, pulse code modulation; frequency and time division multiplexing, amplitude-, phase-, frequency-, pulse shift keying for digital modulation	Available Now
IN-10	<b>Basic Level Communication and Optical Inst. – 2:</b> Optical sources and detectors: LED, laser, photo-diode, light dependent resistor and their characteristics; interferometer: applications in metrology; basics of fiber optic sensing.	Available Now
IN-11	<b>Basic Level 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	Available Now
IN-12	<b>Basic Level Control Systems – 2:</b> Frequency response; 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.	Available Now
IN-13	<b>Basic Level Analog Electronics – 1:</b> Small signal equivalent circuits of diodes, BJTs and MOSFETs; Simple diode circuits: clipping, clamping and rectifiers; Single-stage BJT and MOSFET amplifiers: biasing, bias stability, mid-frequency small signal analysis and frequency response	Available Now
IN-14	<b>Basic Level Analog Electronics – 2:</b> BJT and MOSFET amplifiers: multi-stage, differential, feedback, power and operational; 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.	Available Now
IN-15	<b>Basic Level Digital Electronics – 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 and PLAs;	Available Now
IN-16	<b>Basic Level Digital Electronics – 2:</b> 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.	Available Now
IN-17	<b>Basic Level Engg. Mathematics – 1: 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>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>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.	Available Now
IN-18	<b>Basic Level Engg. Mathematics – 2: Vector Analysis:</b> Vectors in plane and space, vector operations, gradient, divergence and curl, Gauss's, Green's and Stoke's theorems. <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.	Available Now

TEST No	TEST NAME : SYLLABUS	DATE OF ACTIVATION
	<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.	
IN-19	<b>Basic Level General Aptitude - 1:</b> English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction	Available Now
IN-20	<b>Basic Level General Aptitude - 2:</b> Numerical computation, numerical estimation, numerical reasoning and data interpretation	Available Now
IN-21	<b>Advance Level Electrical Circuits - 1:</b> Voltage and current sources: independent, dependent, ideal and practical; v-i relationships of resistor, inductor, mutual inductor and capacitor Kirchoff's laws, mesh and nodal analysis, superposition, Thevenin, Norton, maximum power transfer and reciprocity theorems.	Available Now
IN-22	<b>Advance Level Electrical Circuits - 2:</b> Transient analysis of RLC circuits with dc excitation. Peak-, average- and rms values of ac quantities; apparent-, active- and reactive powers; phasor analysis, impedance and admittance; series and parallel resonance, locus diagrams, realization of basic filters with R, L and C elements. One-port and two-port networks, driving point impedance and admittance, open-, and short circuit parameters.	Available Now
IN-23	<b>Advance Level Sensors and Industrial Inst. - 1:</b> Resistive-, capacitive-, inductive-, piezoelectric-, Hall effect sensors and associated signal conditioning circuits; transducers for industrial instrumentation: displacement (linear and angular), velocity, acceleration, force, torque, vibration, shock, pressure (including low pressure),	Available Now
IN-24	<b>Advance Level Sensors and Industrial Inst. – 2:</b> Flow (differential pressure, variable area, electromagnetic, ultrasonic, turbine and open channel flow meters) temperature (thermocouple, bolometer, RTD (3/4 wire), thermistor, pyrometer and semiconductor); liquid level, pH, conductivity and viscosity measurement.	Available Now
IN-25	<b>Advance Level Signals and Systems – 1:</b> Continuous-time signals: Fourier series and Fourier transform representations, sampling theorem and applications; Discrete-time signals: discrete-time Fourier transform (DTFT), DFT, FFT	Available Now
IN-26	<b>Advance Level Signals and Systems – 2:</b> Z-transform, interpolation of discrete-time signals; 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.	Available Now
IN-27	<b>Advance Level Measurements – 1:</b> SI units, systematic and random errors in measurement, expression of uncertainty - accuracy and precision index, propagation of errors. PMMC, MI and dynamometer type instruments; dc potentiometer; bridges for measurement of R, L and C, Q-meter.	Available Now
IN-28	<b>Advance Level Measurements – 2:</b> Measurement of voltage, current and power in single and three phase circuits; ac and dc current probes; true rms meters, voltage and current scaling, instrument transformers, timer/counter, time, phase and frequency measurements, digital voltmeter, digital multimeter; oscilloscope, shielding and grounding.	Available Now
IN-29	<b>Advance Level Communication and Optical Inst. – 1:</b> Amplitude- and frequency modulation and demodulation; Shannon's sampling theorem, pulse code modulation; frequency and time division multiplexing, amplitude-, phase-, frequency-, pulse shift keying for digital modulation;	Available Now
IN-30	<b>Advance Level Communication and Optical Inst. – 2:</b> Optical sources and detectors: LED, laser, photo-diode, light dependent resistor and their characteristics; interferometer: applications in metrology; basics of fiber optic sensing.	Available Now

TEST No	TEST NAME : SYLLABUS	DATE OF ACTIVATION
IN-31	<b>Advance Level 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;	Available Now
IN-32	<b>Advance Level Control Systems – 2:</b> Frequency response; 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.	Available Now
IN-33	<b>Advance Level Analog Electronics – 1:</b> Small signal equivalent circuits of diodes, BJTs and MOSFETs; Simple diode circuits: clipping, clamping and rectifiers; Single-stage BJT and MOSFET amplifiers: biasing, bias stability, mid-frequency small signal analysis and frequency response;	Available Now
IN-34	<b>Advance Level Analog Electronics – 2:</b> BJT and MOSFET amplifiers: multi-stage, differential, feedback, power and operational; 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.	Available Now
IN-35	<b>Advance Level Digital Electronics – 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 and PLAs;	Available Now
IN-36	<b>Advance Level Digital Electronics – 2:</b> 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.	Available Now
IN-37	<b>Advance Level Engg. Mathematics – 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. <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>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.	Available Now
IN-38	<b>Advance Level Engg. Mathematics – 2: Vector Analysis:</b> Vectors in plane and space, vector operations, gradient, divergence and curl, Gauss's, Green's and Stoke's theorems. <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. <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.	Available Now
IN-39	<b>Advance Level General Aptitude - 1:</b> English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction	Available Now
IN-40	<b>Advance Level General Aptitude - 2:</b> Numerical computation, numerical estimation, numerical reasoning and data interpretation	Available Now

## SUBJECT WISE TESTS

- Each test carries 50 marks and 90 minutes duration
- Test consists of 10 one mark questions and 20 two marks questions

TEST No	TEST NAME : SYLLABUS	DATE OF ACTIVATION
IN-41	<b>Basic Level Electrical Circuits:</b> Voltage and current sources: independent, dependent, ideal and practical; v-i relationships of resistor, inductor, mutual inductor and capacitor; transient analysis of RLC circuits with dc excitation. Kirchoff's laws, mesh and nodal analysis, superposition, Thevenin, Norton, maximum power transfer and reciprocity theorems. Peak-, average- and rms values of ac quantities; apparent-, active- and reactive powers; phasor analysis, impedance and admittance; series and parallel resonance, locus diagrams, realization of basic filters with R, L and C elements. One-port and two-port networks, driving point impedance and admittance, open-, and short circuit parameters	Available Now
IN-42	<b>Basic Level Sensors and Industrial Inst.:</b> Resistive-, capacitive -, inductive-, piezoelectric-, Hall effect sensors and associated signal conditioning circuits; transducers for industrial instrumentation: displacement (linear and angular), velocity, acceleration, force, torque, vibration, shock, pressure (including low pressure), flow (differential pressure, variable area, electromagnetic, ultrasonic, turbine and open channel flow meters) temperature (thermocouple, bolometer, RTD (3/4 wire), thermistor, pyrometer and semiconductor); liquid level, pH, conductivity and viscosity measurement.	Available Now
IN-43	<b>Basic Level Signals and Systems:</b> Periodic, aperiodic and impulse signals; Laplace, Fourier and z-transforms; transfer function, frequency response of first and second order linear time invariant systems, impulse response of systems; convolution, correlation. Discrete time system: impulse response, frequency response, pulse transfer function; DFT and FFT; basics of IIR and FIR filters.	Available Now
IN-44	<b>Basic Level Measurements:</b> SI units, systematic and random errors in measurement, expression of uncertainty - accuracy and precision index, propagation of errors. PMMC, MI and dynamometer type instruments; dc potentiometer; bridges for measurement of R, L and C, Q-meter. Measurement of voltage, current and power in single and three phase circuits; ac and dc current probes; true rms meters, voltage and current scaling, instrument transformers, timer/counter, time, phase and frequency measurements, digital voltmeter, digital multimeter; oscilloscope, shielding and grounding.	Available Now
IN-45	<b>Basic Level Communication and Optical Inst.:</b> Amplitude- and frequency modulation and demodulation; Shannon's sampling theorem, pulse code modulation; frequency and time division multiplexing, amplitude-, phase-, frequency-, pulse shift keying for digital modulation; optical sources and detectors: LED, laser, photo-diode, light dependent resistor and their characteristics; interferometer: applications in metrology; basics of fiber optic sensing.	Available Now
IN-46	<b>Basic Level Control Systems:</b> Feedback principles, signal flow graphs, transient response, steady-state-errors, Bode plot, phase and gain margins, Routh and Nyquist criteria, root loci, design of lead, lag and lead-lag compensators, state-space representation of systems; time-delay systems; mechanical, hydraulic and pneumatic system components, synchro pair, servo and stepper motors, servo valves; on-off, P, P-I, P-I-D, cascade, feedforward, and ratio controllers.	Available Now
IN-47	<b>Basic Level Analog Electronics:</b> Characteristics and applications of diode, Zener diode, BJT and MOSFET; small signal analysis of transistor circuits, feedback amplifiers. Characteristics of operational amplifiers; applications of opamps: difference amplifier, adder, subtractor, integrator, differentiator, instrumentation amplifier, precision rectifier, active filters and other circuits. Oscillators, signal generators, voltage controlled oscillators and phase locked loop.	Available Now
IN-48	<b>Basic Level Digital Electronics:</b> Combinational logic circuits, minimization of	Available



	<p>Boolean functions. IC families: TTL and CMOS. Arithmetic circuits, comparators, Schmitt trigger, multi-vibrators, sequential circuits, flip-flops, shift registers, timers and counters; sample-and-hold circuit, multiplexer, analog-to-digital (successive approximation, integrating, flash and sigma-delta) and digital-to-analog converters (weighted R, R-2R ladder and current steering logic). Characteristics of ADC and DAC (resolution, quantization, significant bits, conversion/settling time); basics of number systems, 8-bit microprocessor and microcontroller: applications, memory and input-output interfacing; basics of data acquisition systems.</p>	Now
IN-49	<p><b>Basic Level Engg. Mathematics:</b></p> <p><b>Linear Algebra:</b> Matrix algebra, systems of linear equations, Eigen values and Eigen vectors.</p> <p><b>Calculus:</b> Mean value theorems, theorems of integral calculus, partial derivatives, maxima and minima, multiple integrals, Fourier series, vector identities, line, surface and volume integrals, Stokes, Gauss and Green's theorems.</p> <p><b>Differential equations:</b> First order equation (linear and nonlinear), higher order linear differential equations with constant coefficients, method of variation of parameters, Cauchy's and Euler's equations, initial and boundary value problems, solution of partial differential equations: variable separable method.</p> <p><b>Analysis of complex variables:</b> Analytic functions, Cauchy's integral theorem and integral formula, Taylor's and Laurent's series, residue theorem, solution of integrals.</p> <p><b>Probability and Statistics:</b> Sampling theorems, conditional probability, mean, median, mode and standard deviation, random variables, discrete and continuous distributions: normal, Poisson and binomial distributions.</p> <p><b>Numerical Methods:</b> Matrix inversion, solutions of non-linear algebraic equations, iterative methods for solving differential equations, numerical integration, regression and correlation analysis.</p>	Available Now
IN-50	<p><b>Basic Level General Aptitude:</b> English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction Numerical computation, numerical estimation, numerical reasoning and data interpretation</p>	Available Now
IN-51	<p><b>Advanced Electrical Circuits &amp; Signals and Systems:</b></p> <p><b>Electrical Circuits:</b> Voltage and current sources: independent, dependent, ideal and practical; v-i relationships of resistor, inductor, mutual inductor and capacitor; transient analysis of RLC circuits with dc excitation.</p> <p>Kirchoff's laws, mesh and nodal analysis, superposition, Thevenin, Norton, maximum power transfer and reciprocity theorems.</p> <p>Peak-, average- and rms values of ac quantities; apparent-, active- and reactive powers; phasor analysis, impedance and admittance; series and parallel resonance, locus diagrams, realization of basic filters with R, L and C elements.</p> <p>One-port and two-port networks, driving point impedance and admittance, open-, and short circuit parameters.</p> <p><b>Signals &amp; Systems:</b> Periodic, aperiodic and impulse signals; Laplace, Fourier and z-transforms; transfer function, frequency response of first and second order linear time invariant systems, impulse response of systems; convolution, correlation. Discrete time system: impulse response, frequency response, pulse transfer function; DFT and FFT; basics of IIR and FIR filters.</p>	Available Now
IN-52	<p><b>Advanced Measurements &amp; Sensors and Industrial Inst.:</b></p> <p><b>Measurements:</b> SI units, systematic and random errors in measurement, expression of uncertainty - accuracy and precision index, propagation of errors. PMMC, MI and dynamometer type instruments; dc potentiometer; bridges for measurement of R, L and C, Q-meter. Measurement of voltage, current and power in single and three phase circuits; ac and dc current probes; true rms meters, voltage and current scaling, instrument transformers, timer/counter, time, phase and frequency measurements, digital voltmeter, digital multimeter; oscilloscope, shielding and grounding.</p> <p><b>Sensors and Industrial Inst.:</b> Resistive-, capacitive -, inductive-, piezoelectric-, Hall effect sensors and associated signal conditioning circuits; transducers for industrial instrumentation: displacement (linear and angular), velocity, acceleration, force, torque, vibration, shock, pressure (including low pressure), flow (differential pressure, variable area, electromagnetic, ultrasonic, turbine and open channel flow meters) temperature (thermocouple, bolometer, RTD (3/4 wire), thermistor, pyrometer and semiconductor); liquid level, pH, conductivity and viscosity measurement.</p>	Available Now

IN-53	<p><b>Advanced Communication and Optical Inst. &amp; Control Systems:</b></p> <p><b>Communication &amp; Optical Inst. :</b> Amplitude- and frequency modulation and demodulation; Shannon's sampling theorem, pulse code modulation; frequency and time division multiplexing, amplitude-, phase-, frequency-, pulse shift keying for digital modulation; optical sources and detectors: LED, laser, photo-diode, light dependent resistor and their characteristics; interferometer: applications in metrology; basics of fiber optic sensing.</p> <p><b>Control Systems:</b> Feedback principles, signal flow graphs, transient response, steady-state-errors, Bode plot, phase and gain margins, Routh and Nyquist criteria, root loci, design of lead, lag and lead-lag compensators, state-space representation of systems; time-delay systems; mechanical, hydraulic and pneumatic system components, synchro pair, servo and stepper motors, servo valves; on-off, P, P-I, P-I-D, cascade, feedforward, and ratio controllers</p>	Available Now
IN-54	<p><b>Advanced Analog Electronics &amp; Digital Electronics:</b></p> <p><b>Analog Electronics:</b> Characteristics and applications of diode, Zener diode, BJT and MOSFET; small signal analysis of transistor circuits, feedback amplifiers. Characteristics of operational amplifiers; applications of opamps: difference amplifier, adder, subtractor, integrator, differentiator, instrumentation amplifier, precision rectifier, active filters and other circuits. Oscillators, signal generators, voltage controlled oscillators and phase locked loop.</p> <p><b>Digital Electronics:</b> Combinational logic circuits, minimization of Boolean functions. IC families: TTL and CMOS. Arithmetic circuits, comparators, Schmitt trigger, multi-vibrators, sequential circuits, flip-flops, shift registers, timers and counters; sample-and-hold circuit, multiplexer, analog-to-digital (successive approximation, integrating, flash and sigma-delta) and digital-to-analog converters (weighted R, R-2R ladder and current steering logic). Characteristics of ADC and DAC (resolution, quantization, significant bits, conversion/settling time); basics of number systems, 8-bit microprocessor and microcontroller: applications, memory and input-output interfacing; basics of data acquisition systems</p>	Available Now
IN-55	<p><b>Advanced Engineering Mathematics:</b></p> <p><b>Linear Algebra:</b> Matrix algebra, systems of linear equations, Eigen values and Eigen vectors.</p> <p><b>Calculus:</b> Mean value theorems, theorems of integral calculus, partial derivatives, maxima and minima, multiple integrals, Fourier series, vector identities, line, surface and volume integrals, Stokes, Gauss and Green's theorems.</p> <p><b>Differential equations:</b> First order equation (linear and nonlinear), higher order linear differential equations with constant coefficients, method of variation of parameters, Cauchy's and Euler's equations, initial and boundary value problems, solution of partial differential equations: variable separable method.</p> <p><b>Analysis of complex variables:</b> Analytic functions, Cauchy's integral theorem and integral formula, Taylor's and Laurent's series, residue theorem, solution of integrals.</p> <p><b>Probability and Statistics:</b> Sampling theorems, conditional probability, mean, median, mode and standard deviation, random variables, discrete and continuous distributions: normal, Poisson and binomial distributions.</p> <p><b>Numerical Methods:</b> Matrix inversion, solutions of non-linear algebraic equations, iterative methods for solving differential equations, numerical integration, regression and correlation analysis.</p>	Available Now
IN-56	<p><b>Advanced General Aptitude:</b> English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction Numerical computation, numerical estimation, numerical reasoning and data interpretation</p>	Available Now
IN-57	<p><b>Electrical Circuits &amp; Signals and Systems:</b></p> <p><b>Electrical Circuits:</b> Voltage and current sources: independent, dependent, ideal and practical; v-i relationships of resistor, inductor, mutual inductor and capacitor; transient analysis of RLC circuits with dc excitation.</p> <p>Kirchoff's laws, mesh and nodal analysis, superposition, Thevenin, Norton, maximum power transfer and reciprocity theorems. Peak-, average- and rms values of ac quantities; apparent-, active- and reactive powers; phasor analysis, impedance and</p>	Available Now

	<p>admittance; series and parallel resonance, locus diagrams, realization of basic filters with R, L and C elements. One-port and two-port networks, driving point impedance and admittance, open-, and short circuit parameters.</p> <p><b>Signals &amp; Systems:</b> Periodic, aperiodic and impulse signals; Laplace, Fourier and z-transforms; transfer function, frequency response of first and second order linear time invariant systems, impulse response of systems; convolution, correlation. Discrete time system: impulse response, frequency response, pulse transfer function; DFT and FFT; basics of IIR and FIR filters.</p>	
IN-58	<p><b>Measurements &amp; Sensors and Industrial Inst:</b> <b>Measurements:</b> SI units, systematic and random errors in measurement, expression of uncertainty - accuracy and precision index, propagation of errors. PMMC, MI and dynamometer type instruments; dc potentiometer; bridges for measurement of R, L and C, Q-meter. Measurement of voltage, current and power in single and three phase circuits; ac and dc current probes; true rms meters, voltage and current scaling, instrument transformers, timer/counter, time, phase and frequency measurements, digital voltmeter, digital multimeter; oscilloscope, shielding and grounding.</p> <p><b>Sensors and Industrial Inst.:</b> Resistive-, capacitive -, inductive-, piezoelectric-, Hall effect sensors and associated signal conditioning circuits; transducers for industrial instrumentation: displacement (linear and angular), velocity, acceleration, force, torque, vibration, shock, pressure (including low pressure), flow (differential pressure, variable area, electromagnetic, ultrasonic, turbine and open channel flow meters) temperature (thermocouple, bolometer, RTD (3/4 wire), thermistor, pyrometer and semiconductor); liquid level, pH, conductivity and viscosity measurement.</p>	Available Now
IN-59	<p><b>Communication and Optical Inst. &amp; Control Systems:</b></p> <p><b>Communication &amp; Optical Inst:</b> Amplitude- and frequency modulation and demodulation; Shannon's sampling theorem, pulse code modulation; frequency and time division multiplexing, amplitude-, phase-, frequency-, pulse shift keying for digital modulation; optical sources and detectors: LED, laser, photo-diode, light dependent resistor and their characteristics; interferometer: applications in metrology; basics of fiber optic sensing.</p> <p><b>Control Systems:</b> Feedback principles, signal flow graphs, transient response, steady-state-errors, Bode plot, phase and gain margins, Routh and Nyquist criteria, root loci, design of lead, lag and lead-lag compensators, state-space representation of systems; time-delay systems; mechanical, hydraulic and pneumatic system components, synchro pair, servo and stepper motors, servo valves; on-off, P, P-I, P-I-D, cascade, feed forward, and ratio controllers.</p>	Available Now
IN-60	<p><b>Analog Electronics &amp; Digital Electronics:</b></p> <p><b>Analog Electronics:</b> Characteristics and applications of diode, Zener diode, BJT and MOSFET; small signal analysis of transistor circuits, feedback amplifiers. Characteristics of operational amplifiers; applications of opamps: difference amplifier, adder, subtractor, integrator, differentiator, instrumentation amplifier, precision rectifier, active filters and other circuits. Oscillators, signal generators, voltage controlled oscillators and phase locked loop.</p> <p><b>Digital Electronics:</b> Combinational logic circuits, minimization of Boolean functions. IC families: TTL and CMOS. Arithmetic circuits, comparators, Schmitt trigger, multi-vibrators, sequential circuits, flip-flops, shift registers, timers and counters; sample-and-hold circuit, multiplexer, analog-to-digital (successive approximation, integrating, flash and sigma-delta) and digital-to-analog converters (weighted R, R-2R ladder and current steering logic). Characteristics of ADC and DAC (resolution, quantization, significant bits, conversion/settling time); basics of number systems, 8-bit microprocessor and microcontroller: applications, memory and input-output interfacing; basics of data acquisition systems</p>	Available Now
IN-61	<p><b>Engineering Mathematics:</b></p> <p><b>Linear Algebra:</b> Matrix algebra, systems of linear equations, Eigen values and Eigen vectors.</p> <p><b>Calculus:</b> Mean value theorems, theorems of integral calculus, partial derivatives, maxima and minima, multiple integrals, Fourier series, vector identities, line, surface and volume integrals, Stokes, Gauss and Green's theorems.</p> <p><b>Differential equations:</b> First order equation (linear and nonlinear), higher order linear differential equations with constant coefficients, method of variation of parameters, Cauchy's and Euler's equations, initial and boundary value problems, solution of</p>	Available Now



	<p>partial differential equations: variable separable method.</p> <p><b>Analysis of complex variables:</b> Analytic functions, Cauchy's integral theorem and integral formula, Taylor's and Laurent's series, residue theorem, solution of integrals.</p> <p><b>Probability and Statistics:</b> Sampling theorems, conditional probability, mean, median, mode and standard deviation, random variables, discrete and continuous distributions: normal, Poisson and binomial distributions.</p> <p><b>Numerical Methods:</b> Matrix inversion, solutions of non-linear algebraic equations, iterative methods for solving differential equations, numerical integration, regression and correlation analysis.</p>	
IN-62	<p><b>General Aptitude:</b> English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction Numerical computation, numerical estimation, numerical reasoning and data interpretation</p>	Available Now

## MOCK TESTS

- Each test carries 100 marks and 3 hours duration

TEST No	TEST NAME	DATE OF ACTIVATION
IN-63	Full Syllabus Test-1 (Basic Level)	Available Now
IN-64	Full Syllabus Test-2 (Basic Level)	Available Now
IN-65	Full Syllabus Test-3 (Basic Level)	Available Now
IN-66	Full Syllabus Test-1 (Advance Level)	Available Now
IN-67	Full Syllabus Test-2 (Advance Level)	Available Now
IN-68	Full Syllabus Test-3 (Advance Level)	Available Now
IN-69	GATE MOCK TEST-1	Available Now
IN-70	GATE MOCK TEST-2	Available Now
IN-71	GATE MOCK TEST-3	Available Now
IN-72	GATE MOCK TEST-4	Available Now
IN-73	GATE MOCK TEST-5	Available Now
IN-74	GATE MOCK TEST-6	Available Now

## MSQ TYPE TESTS (Subject Wise)

- Each test carries 40 marks and 60 Minutes duration

TEST No	TEST NAME	DATE OF ACTIVATION
IN-75	General Aptitude	Available Now