ACE Engineering Academy
Leading Institute for ESE/GATE/PSUs

GATE-2022

Online Test Series

Instrumentation Engineering - Schedule

No.of Tests : 65 + *53* *free* practice tests of GATE-2021 Online Test Series		
	GATE - 2022 Test Series	Practice Tests GATE - 2021 Test Series
Topic wise Tests	25	24
Grand Tests (Subject Wise Tests + Multi-Subject Wise Tests)	28	17
Full Length Mock Tests	12	12
Total Tests - 118		

All tests will be Active upto GATE -2022 Examination.

Topic wise Tests

(No.of Questions: 15, Time duration: 45 Minutes and Marks: 25 M)

Test No	Name of the Topic	Date of Activation
Test-01	**Engineering Mathematics-1:** Linear Algebra: Matrix algebra, systems of linear equations, consistency and rank, Eigen values and Eigen vectors. Calculus: 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. Differential equations: First order equation (linear and nonlinear), second 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.	
Test-02	**Engineering Mathematics-2:** Analysis of complex variables: Analytic functions, Cauchy's integral theorem and integral formula, Taylor's and Laurent's series, residue theorem, solution of integrals. Probability and Statistics: Sampling theorems, conditional probability, mean, median, mode, standard deviation and variance; random variables: discrete and continuous distributions: normal, Poisson and binomial distributions. Numerical Methods: Matrix inversion, solutions of non-linear algebraic equations, iterative methods for solving differential equations, numerical integration, regression and correlation analysis.	03-05-2021
Test-03	**Control Systems-1:** Feedback principles, signal flow graphs, transient response, steady-state-errors, Routh criteria, root loci.	
Test-04	**Control Systems-2:** Bode plot, phase and gain margins, Nyquist criteria, 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,tuning of PID controllers and sizing of control valves.	
Test-05	**Signals and Systems-1:** Periodic, aperiodic and impulse signals; Fourier transform. transfer function, frequency response of first and second order linear time invariant systems, impulse response of systems; convolution, correlation.	
Test-06	**Signals and Systems-2:** Laplace,and z-transforms; Discrete time system: impulse response, frequency response, pulse transfer function; DFT and FFT; basics of IIR and FIR filters.	
Test-07	**Digital Electronics-1:** Combinational logic circuits, minimization of Boolean functions.. Arithmetic circuits, comparators, Schmitt trigger, multi-vibrators. IC families: TTL and CMOS.	10-05-2021
Test-08	**Digital Electronics-2:** 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. sequential circuits, flip- flops, basics of number systems, , shift registers, timers and counters;	
Test-09	**Digital Electronics-3:** 8-bit microprocessor and microcontroller: applications, memory and input-output interfacing; basics of data acquisition systems, basics of distributed control systems (DCS) and programmable logic controllers (PLC).	
Test-10	**Electrical Circuits and Machines-1:** 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.	
Test-11	**Electrical Circuits and Machines-2:** 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. transient analysis of RLC circuits with dc excitation, transient analysis of RLC circuits with ac excitation. One-port and two-port networks, driving point impedance and admittance, open-, and short circuit parameters.	
Test-12	**Electrical Circuits and Machines-3 :** Single phase transformer: equivalent circuit, phasor diagram, open circuit and short circuit tests, regulation and efficiency; Three phase induction motors: principle of operation, types, performance, torque-speed characteristics, no-load and blocked rotor tests, equivalent circuit, starting and speed control; Types of losses and efficiency calculations of electric machines.	17-05-2021
Test-13	**Electricity and Magnetism:** Coulomb's Law, Electric Field Intensity, Electric Flux Density, Gauss's Law, Divergence, Electric field and potential due to point, line, plane and spherical charge distributions, Effect of dielectric medium, Capacitance of simple configurations, Biot-Savart's law, Ampere's law, Curl, Faraday's law, Lorentz force, Inductance, Magnetomotive force, Reluctance, Magnetic circuits, Self and Mutual inductance of simple configurations.	
Test-14	**Sensors and Industrial Instrumentation-1:** 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).	
Test-15	**Sensors and Industrial Instrumentation-2:** Flow (differential pressure, variable area, electromagnetic, ultrasonic, turbine and open channel flow meters)	24-05-2021
Test-16	**Sensors and Industrial Instrumentation-3:** Temperature (thermocouple, bolometer, RTD (3/4 wire), thermistor, pyrometer and semiconductor); liquid level, pH, conductivity and viscosity measurement. 4-20 mA two-wire transmitter.	

Test No	Name of the Topic	Date of Activation
Test-17	**Analog Electronics-1:** Characteristics and applications of diode, Zener diode, BJT and MOSFET; small signal analysis of transistor circuits, feedback amplifiers.	24-05-2021
Test-18	**Analog Electronics-2:** Characteristics of operational amplifiers; applications of op amps: 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,sources and effects of noise and interference in electronic circuits.	
Test-19	**Communication and Optical instrumentation-1:** Amplitude- and frequency modulation and demodulation; Shannon's sampling theorem, pulse code modulation; frequency and time division multiplexing, amplitude-, phase-, frequency-,quadrature amplitude, pulse shift keying for digital modulation.	31-05-2021
Test-20	**Communication and Optical instrumentation-2:** Optical sources and detectors: LED, laser, photo-diode, light dependent resistor,square law detectors and their characteristics; interferometer: applications in metrology; basics of fiber optic sensing,UV-VIS Spectro photometers, Mass spectrometer.	
Test-21	**Measurements-1:** SI units,standards (R,L,C, voltage, current and frequency), systematic and random errors in measurement, expression of uncertainty - accuracy and precision index, propagation of errors,linear and weighted regression. ; Bridges: Wheatstone, Kelvin, Megohm, Maxwell, Anderson, Schering and Wien for measurement of R, L, C and frequency, Q-meter.	
Test-22	**Measurements-2:** 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.	
Test-23	**Verbal Ability:** Basic English grammar: tenses, articles, adjectives, prepositions, conjunctions, verb-noun agreement, and other parts of speech. Basic vocabulary: words, idioms, and phrases in context. Reading and comprehension. Narrative sequencing.	07-06-2021
Test-24	**Quantitative Aptitude:** Data interpretation: data graphs (bar graphs, pie charts, and other graphs representing data), 2- and 3-dimensional plots, maps, and tables. Numerical computation and estimation: ratios, percentages, powers, exponents and logarithms, permutations and combinations, and series Mensuration and geometry. Elementary statistics and probability.	
Test-25	**Analytical Aptitude:** Logic: deduction and induction, Analogy, Numerical relations and reasoning **Spatial Aptitude:** Transformation of shapes: translation, rotation, scaling, mirroring, assembling, and grouping Paper folding, cutting, and patterns in 2 and 3 dimensions	

Subject Wise Grand Tests - 1st Series

(No.of Questions: 30, Time duration: 90 Minutes and Marks: 50 M)

Test No	Name of the Subject	Date of Activation
Test-26	Engineering Mathematics	21-06-2021
Test-27	Control Systems	
Test-28	Signals and Systems	28-06-2021
Test-29	Digital Electronics	
Test-30	Electrical Circuits and Machines	12-07-2021
Test-31	Sensors & Industrial Instrumentation	
Test-32	Analog Electronics	19-07-2021
Test-33	Communication & Optical instrumentation	
Test-34	Electricity and Magnetism	26-07-2021
Test-35	Measurements	
Test-36	General Aptitude	02-08-2021

Full Length Mock Test - 1st Series

(No.of Questions: 65, Time duration: 180 Minutes and Marks: 100 M)

Test No	Name of the Mock	Date of Activation
Test-37	Full Length Mock Test-1	09-08-2021
Test-38	Full Length Mock Test-2	16-08-2021
Test-39	Full Length Mock Test-3	23-08-2021

Subject Wise Grand Tests - 2nd Series

(No.of Questions: 30, Time duration: 90 Minutes and Marks: 50 M)

Test No	Name of the Subject	Date of Activation
Test-40	Engineering Mathematics	30-08-2021
Test-41	Control Systems	
Test-42	Signals and Systems	06-09-2021
Test-43	Digital Electronics	
Test-44	Electrical Circuits and Machines	13-09-2021
Test-45	Sensors & Industrial Instrumentation	
Test-46	Analog Electronics	20-09-2021
Test-47	Communication & Optical instrumentation	
Test-48	Electricity and Magnetism	27-09-2021
Test-49	Measurements	
Test-50	General Aptitude	04-10-2021

Full Length Mock Test - 2nd Series

(No.of Questions: 65, Time duration: 180 Minutes and Marks: 100 M)

Test No	Name of the Mock	Date of Activation
Test-51	Full Length Mock Test-4	18-10-2021
Test-52	Full Length Mock Test-5	25-10-2021
Test-53	Full Length Mock Test-6	01-11-2021

Multi-Subject Wise Grand Tests

(No.of Questions: 30, Time duration: 90 Minutes and Marks: 50 M)

Test No	Name of the Subject	Date of Activation
Test-54	Electrical Circuits and Machines and Electricity and Magnetism	15-11-2021
Test-55	Control Systems and Signals and Systems	
Test-56	Communication and Optical Instrumentation	22-11-2021
Test-57	Sensors and Industrial Instrumentation and Digital Electronics	
Test-58	Measurements & Analog Electronics	29-11-2021
Test-59	Engineering Mathematics & General Aptitude	

Full Length Mock Test - 3rd Series

(No.of Questions: 65, Time duration: 180 Minutes and Marks: 100 M)

Test No	Name of the Mock	Date of Activation
Test-60	Full Length Mock Test-7	20-12-2021
Test-61	Full Length Mock Test-8	27-12-2021
Test-62	Full Length Mock Test-9	03-01-2022
Test-63	Full Length Mock Test-10	10-01-2022
Test-64	Full Length Mock Test-11	17-01-2022
Test-65	Full Length Mock Test-12	24-01-2022

Note: The Syllabus considered as per Previoues year Notification of GATE. ACE Engineering Academy does not take any responsibility for deviations in syllabus in the final exam.

The Dates of above Tests may Change according to the GATE-2022 Exam schedule.

Tests will be activated at 02:00 pm on the scheduled day.

Free Practice Tests of GATE-2021 Online Test Series

Topic wise Tests

(No.of Questions: 15, Time duration: 45 Minutes and Marks: 25 M)

Test No	Name of the Topic	Date of Activation
IN_P-01	**Engineering Mathematics-1:** Linear Algebra, Calculus, Differential Equations.	15-04-2021
IN_P-02	**Engineering Mathematics-2:** Analysis of Complex Variables, Probability and Statistics and Numerical Methods.	
IN_P-03	**Control Systems-1:** Feedback principles, signal flow graphs, transient response, steady-state-errors, Routh criteria, root loci.	
IN_P-04	**Control Systems-2:** Bode plot, phase and gain margins, Nyquist criteria, 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,tuning of PID controllers and sizing of control valves.	
IN_P-05	**Signals and Systems-1:** Periodic, aperiodic and impulse signals; Fourier transform. transfer function, frequency response of first and second order linear time invariant systems, impulse response of systems; convolution, correlation.	
IN_P-06	**Signals and Systems-2:** Laplace,and z-transforms; Discrete time system: impulse response, frequency response, pulse transfer function; DFT and FFT; basics of IIR and FIR filters.	
IN_P-07	**Digital Electronics-1:** Combinational logic circuits, minimization of Boolean functions.. Arithmetic circuits, comparators, Schmitt trigger, multi-vibrators. IC families: TTL and CMOS.	
IN_P-08	**Digital Electronics-2:** 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. sequential circuits, flip- flops, basics of number systems, , shift registers, timers and counters;	
IN_P-09	**Digital Electronics-3:** 8-bit microprocessor and microcontroller: applications, memory and input-output interfacing; basics of data acquisition systems, basics of distributed control systems (DCS) and programmable logic controllers (PLC).	
IN_P-10	**Electrical Circuits and Machines-1:** 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.	
IN_P-11	**Electrical Circuits and Machines-2:** 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.transient analysis of RLC circuits with ac excitation. One-port and two-port networks, driving point impedance and admittance, open-, and short circuit parameters.	
IN_P-12	**Electrical Circuits and Machines-3 :** Single phase transformer: equivalent circuit, phasor diagram, open circuit and short circuit tests, regulation and efficiency; Three phase induction motors: principle of operation, types, performance, torque-speed characteristics, no-load and blocked rotor tests, equivalent circuit, starting and speed control; Types of losses and efficiency calculations of electric machines.	
IN_P-13	**Electricity and Magnetism:** Coulomb's Law, Electric Field Intensity, Electric Flux Density, Gauss's Law, Divergence, Electric field and potential due to point, line, plane and spherical charge distributions, Effect of dielectric medium, Capacitance of simple configurations, Biot-Savart's law, Ampere's law, Curl, Faraday's law, Lorentz force, Inductance, Magnetomotive force, Reluctance, Magnetic circuits, Self and Mutual inductance of simple configurations.	
IN_P-14	**Sensors and Industrial Instrumentation-1:** 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).	
IN_P-15	**Sensors and Industrial Instrumentation-2:** Flow (differential pressure, variable area, electromagnetic, ultrasonic, turbine and open channel flow meters)	
IN_P-16	**Sensors and Industrial Instrumentation-3:** Temperature (thermocouple, bolometer, RTD (3/4 wire), thermistor, pyrometer and semiconductor); liquid level, pH, conductivity and viscosity measurement. 4-20 mA two-wire transmitter.	
IN_P-17	**Analog Electronics-1:** Characteristics and applications of diode, Zener diode, BJT and MOSFET; small signal analysis of transistor circuits, feedback amplifiers.	
IN_P-18	**Analog Electronics-2:** Characteristics of operational amplifiers; applications of op amps: 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,sources and effects of noise and interference in electronic circuits.	

Test No	Name of the Topic	Date of Activation
IN_P-19	**Communication and Optical instrumentation-1:** Amplitude- and frequency modulation and demodulation; Shannon's sampling theorem, pulse code modulation; frequency and time division multiplexing, amplitude-, phase-, frequency-,quadrature amplitude, pulse shift keying for digital modulation.	15-04-2021
IN_P-20	**Communication and Optical instrumentation-2:** Optical sources and detectors: LED, laser, photo-diode, light dependent resistor,square law detectors and their characteristics; interferometer: applications in metrology; basics of fiber optic sensing,UV-VIS Spectro photometers, Mass spectrometer.	
IN_P-21	**Measurements-1:** SI units,standards (R,L,C, voltage, current and frequency), systematic and random errors in measurement, expression of uncertainty - accuracy and precision index, propagation of errors,linear and weighted regression. ; Bridges: Wheatstone, Kelvin, Megohm, Maxwell, Anderson, Schering and Wien for measurement of R, L, C and frequency, Q-meter.	
IN_P-22	**Measurements-2:** 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.	
IN_P-23	**Verbal Ability:** Basic English grammar: tenses, articles, adjectives, prepositions, conjunctions, verb-noun agreement, and other parts of speech Basic vocabulary: words, idioms, and phrases in context Reading and comprehension Narrative sequencing	
IN_P-24	**Numarical Ability:** Quantitative Aptitude: Data interpretation: data graphs (bar graphs, pie charts, and other graphs representing data), 2- and 3-dimensional plots, maps, and tables Numerical computation and estimation: ratios, percentages, powers, exponents and logarithms, permutations and combinations, and series Mensuration and geometry Elementary statistics and probability. Analytical Aptitude: Logic: deduction and induction Analogy Numerical relations and reasoning Spatial Aptitude: Transformation of shapes: translation, rotation, scaling, mirroring, assembling, and grouping Paper folding, cutting, and patterns in 2 and 3 dimensions.	

Subject Wise Grand Tests

(No.of Questions: 30, Time duration: 90 Minutes and Marks: 50 M)

Test No	Name of the Subject	Date of Activation
IN_P-25	Engineering Mathematics	20-04-2021
IN_P-26	Control Systems	
IN_P-27	Signals and Systems	
IN_P-28	Digital Electronics	
IN_P-29	Electrical Circuits and Machines	
IN_P-30	Sensors & Industrial Instrumentation	
IN_P-31	Analog Electronics	
IN_P-32	Communication & Optical instrumentation	
IN_P-33	Electricity and Magnetism	
IN_P-34	Measurements	
IN_P-35	General Aptitude	

Multi Subject Wise Grand Tests

(No.of Questions: 30, Time duration: 90 Minutes and Marks: 50 M)

Test No	Name of the Subject	Date of Activation
IN_P-36	Electricity and Magnetism& Sensors and Industrial Instrumentation	20-04-2021
IN_P-37	Control Systems & Signals and Systems	
IN_P-38	Communication and Optical Instrumentation	
IN_P-39	Electrical Circuits and Machines and Digital Electronics	
IN_P-40	Measurements & Analog Electronics	
IN_P-41	Engineering Mathematics & General Aptitude	

Full Length Mock Test

(No.of Questions: 65, Time duration: 180 Minutes and Marks: 100 M)

Test No	Name of the Mock	Date of Activation
IN_P-42	Full Length Mock Test-1	30-04-2021
IN_P-43	Full Length Mock Test-2	
IN_P-44	Full Length Mock Test-3	
IN_P-45	Full Length Mock Test-4	
IN_P-46	Full Length Mock Test-5	
IN_P-47	Full Length Mock Test-6	
IN_P-48	Full Length Mock Test-7	
IN_P-49	Full Length Mock Test-8	
IN_P-50	Full Length Mock Test-9	
IN_P-51	Full Length Mock Test-10	
IN_P-52	Full Length Mock Test-11	
IN_P-53	Full Length Mock Test-12	