



ACE
Engineering Academy
(Leading institute for ESE/GATE/PSUs)


ESE - 2018 PRELIMS



ONLINE TEST SERIES

ELECTRICAL ENGINEERING (EE)

No. of Tests : 44

	Subject Wise Grand Tests	22
	Multi Subject Grand Tests	10
	Full Length Mock Tests	12

All tests will be available till ESE -2018 (Prelims) Examination.

TEST SERIES HIGHLIGHTS

- ★ All India Rank will be given for each test.
- ★ Test wise and overall statistics.
- ★ Comparison with toppers.
- ★ Question wise and test wise time analysis & comparison with toppers on time management.

Subject-wise Tests

Tests will be activated at 6:00 pm on scheduled day

Test No	Subject Name	No. of Questions	Max Marks	Duration	Date of Activation
EE01	Electric Circuits and Fields	50	100	60 Min	01.07.2017
EE02	Control Systems	50	100	60 Min	05.07.2017
EE03	Systems and Signal Processing	50	100	60 Min	09.07.2017
EE04	Basics of Energy and Environment	33	66	40 Min	13.07.2017
EE05	Analog and Digital Electronics	50	100	60 Min	17.07.2017
EE06	Standards and Quality practices in production, construction, maintenance and services	33	66	40 Min	20.07.2017
EE07	Engineering Mathematics	50	100	60 Min	25.07.2017
EE08	Basics of Project Management	33	66	40 Min	28.07.2017
EE09	Basic Electronics Engineering	50	100	60 Min	02.08.2017
EE10	Information and Communication Technologies (ICT)	33	66	40 Min	05.08.2017
EE11	Electrical and Electronic Measurements	50	100	60 Min	10.08.2017
EE12	Ethics and values in Engineering profession	33	66	40 Min	13.08.2017
EE13	Computer Fundamentals	50	100	60 Min	18.08.2017
EE14	Engineering Aptitude covering Logical reasoning and Analytical ability	33	66	40 Min	21.08.2017
EE15	Electrical Machines	50	100	60 Min	27.08.2017
EE16	Basics of Material Science and Engineering	33	66	40 Min	30.08.2017
EE17	Electrical Materials	50	100	60 Min	03.09.2017
EE18	General Principles of Design, Drawing, Importance of Safety	33	66	40 Min	07.09.2017
EE19	Power Systems	50	100	60 Min	11.09.2017
EE20	Engineering Mathematics and Numerical Analysis	33	66	40 Min	14.09.2017
EE21	Power Electronics and Drives	50	100	60 Min	19.09.2017
EE22	Current Issues of National and International importance related to social, Economic and Industrial Development	33	66	40 Min	22.09.2017

Full Length Mock Tests -1st Series

Test No	Mock codes	No. of Questions	Max Marks	Duration	Date of Activation
EE23	Mock-1 PAPER-1	100	200	2 Hours	03.10.2017
EE24	Mock-1 PAPER-2	150	300	3 Hours	05.10.2017
EE25	Mock-2 PAPER-1	100	200	2 Hours	10.10.2017
EE26	Mock-2 PAPER-2	150	300	3 Hours	12.10.2017

Multi Subject Grand Tests

Test No	Subjects codes	No. of Questions	Max Marks	Duration	Date of Activation
EE27	Electric Circuits and Fields + Control Systems	50	100	60 Min	20.10.2017
EE28	Basics of Energy and Environment + Engineering Aptitude covering Logical reasoning and Analytical ability	33	66	40 Min	23.10.2017
EE29	Systems and Signal Processing + Electrical and Electronic Measurements	50	100	60 Min	27.10.2017
EE30	Engineering Mathematics and Numerical Analysis + Current Issues of National and International importance related to social, Economic and Industrial Development	33	66	40 Min	30.10.2017
EE31	Analog and Digital Electronics + Electrical Materials + Basic Electronics Engineering +	50	100	60 Min	04.11.2017
EE32	Basics of Project Management + Basics of Material Science and Engineering	33	66	40 Min	07.11.2017
EE33	Computer Fundamentals + Electrical Machines	50	100	60 Min	12.11.2017
EE34	Information and Communication Technologies (ICT) + General Principles of Design, Drawing, Importance of Safety	33	66	40 Min	15.11.2017
EE35	Engineering Mathematics + Power Systems + Power Electronics and Drives	50	100	60 Min	20.11.2017
EE36	Ethics and values in Engineering profession + Standards and Quality practices in production, construction, maintenance and services	33	66	40 Min	23.11.2017

Full Length Mock Tests -2nd Series

Test No	Mock codes	No. of Questions	Max Marks	Duration	Date of Activation
EE37	Mock-3 PAPER-1	100	200	2 Hours	01.12.2017
EE38	Mock-3 PAPER-2	150	300	3 Hours	03.12.2017
EE39	Mock-4 PAPER-1	100	200	2 Hours	10.12.2017
EE40	Mock-4 PAPER-2	150	300	3 Hours	12.12.2017
EE41	Mock-5 PAPER-1	100	200	2 Hours	23.12.2017
EE42	Mock-5 PAPER-2	150	300	3 Hours	23.12.2017
EE43	Mock-6 PAPER-1	100	200	2 Hours	30.12.2017
EE44	Mock-6 PAPER-2	150	300	3 Hours	30.12.2017

NOTE: The Dates of above MOCK Tests may Change according to the ESE – 2018(Prelims) Exam schedule.

Syllabus for ESE-2018 (Prelims), Paper-1

Subject	Syllabus
Basics of Energy and Environment : Conservation, environmental pollution and degradation, Climate Change, Environmental impact assessment	<p>Energy –Basics of Environment– Conservation</p> <p>Energy: Concept of Energy, Classification of Energy Resources , Energy Resources in India Energy Policies and Acts in India.</p> <p>Basics of Environment: Components of Ecosystem, Ecosystem, Types of Ecosystem, Structure of Ecosystem, Terminology of Species, Nutrient Cycles.</p> <p>Conservation: Biodiversity - Types of Biodiversity, Value of Biodiversity, Loss of Biodiversity, Threat to Biodiversity, Conservation of Biodiversity, International & National Policies of Biodiversity, International & National Organizations related to Biodiversity, Acts related to biodiversity. Sustainable Development- Concept of Sustainable Development, Carrying Capacity, Ecological Foot Print, Earth Debt day, Principles of Sustainable Development, Initiatives of Sustainable Development , Millennium Development Goals,Sustainable Development Goal, Sustainable Agriculture.</p> <p>Climate Change – Degradation– Pollution</p> <p>Climate Change: Introduction- Basic of Climate Change-Green House Effect, Causes , Impacts. Ozone Depletion-Causes, Impacts , International & National Measures to Control Ozone Depletion. Acid Rains-Causes, Effects, International & National Measures to Control Climate Change.</p> <p>Degradation: Deforestation-Causes, Impact, Preventive measures, Soil erosion-Causes, Impact, Preventive measures, Desertification-Causes, Impact, Preventive measures.</p> <p>Pollution: Basic Concepts- Types of Pollution, Air Pollution, Sources, Impacts, Controls, Water Pollution, Sources, Impacts, Controls, Noise Pollution, Sources, Impacts, Controls , Soil Pollution, Sources, Impacts, Controls, Radiation Pollution, Sources, Impacts, Controls, Solid Waste, Sources, Impacts, Controls.</p> <p>Environmental Impact Assessment(EIA): Concept; Principles; Process; stakeholders; Projects requiring EIA; Social Impact Assessment; Merits and Demerits of EIA;</p>
Engineering Aptitude covering Logical reasoning and Analytical ability	<p>Engineering Aptitude . Logical reasoning & Analytical ability.</p>
Engineering Mathematics and Numerical Analysis	<p>Matrix theory, Eigen values & Eigen vectors, system of linear equations, Numerical methods for solution of non-linear algebraic equations and differential equations, integral calculus, partial derivatives, maxima and minima, Line, Surface and Volume Integrals . Fourier series, linear, nonlinear and partial differential equations, initial and boundary value problems, complex variables, Taylor’s and Laurent’s series, residue theorem, probability and statistics fundamentals, Sampling theorem, random variables, Normal and Poisson distributions, correlation and regression analysis.</p>

Subject	Syllabus
<p>Current Issues of National and International importance related to social, Economic and Industrial Development</p>	<p>Background Concepts Economic and Industrial Development Development - Growth; three Sectors of Economy - Agriculture, Industry and Services; National Income; Inflation; Banking; Financial Markets; Public Finance; External Sector ; Economic Infrastructure; and Related Policies and Schemes of Govt. Social Development : Planning-NITI Ayog; Poverty-Unemployment; Rural and Urban Development; Education; Welfare; Women and Childern; International Issues: Indias bilateral and Multilateral issues; UNO- Agencies, Funds; Economic Institutions-World Bank, IMF,WTO,ADB,AIIB; Agreements and Summits. Current Affairs:</p>
<p>Basics of Project Management</p>	<p>Intoduction: Project and project management, classification of project, project life cycle, tools & techniques in Project management. Project Planning: Selection of a project, objective and goals, work break down structure (WBS). Project Scheduling: Scheduling tools, charts, network diagrams, CPM Networks, PERT Networks Resource Allocation: project crashing, resource leveling & smoothening. Project Monitoring & Controlling: Monitoring tools, project controlling. Project Auditing & Termination: Purpose of auditing-goals of the system, project termination (Closeout), project procurement and materials management.</p>
<p>Basics of Material Science and Engineering</p>	<p>Crystal structures and Defects:-Primary bonds, Space lattice, unit cell, lattice parameters, crystal structures, coordination number and packing factor of SC, BCC, FCC, Diamond structures, point defects, line defects, crystallographic planes and directions. Crystalline materials and amorphous materials. Electrical Materials:- Conductors – Ohm’s Law, specific resistance, high conductivity materials, Low conductivity materials, contact materials, alloy conductors and applications, semiconductors, Energy band gap theory, Insulators and super conductors. Nano materials:- definition, preparation and properties, Graphite, CNT, Fullerene, Graphene, Quantum dots and their properties and applications, MEMS, NEMS. Iron-Carbon Diagram and Steel alloys:- Basics of phase diagram, Types of steels and steel alloys, properties of steel Polymers:- Structure and Types of polymers, characteristics and applications of polymers. Nuclear materials:- Basics of Nuclear Physics (Fission, Fussion), applications. Dielectric Materials:- Polarization, dielectric strength, break down, polar, non polar solids, Ferroelectrics, Piezo electrics, pyro electrics and their materials and applications. Magnetic Materials:- Magnetization, susceptibility and classification of magnetic materials – dia, para, ferro, anti ferro and ferri magnetic materials, hard and soft magnetic materials, influence of temperature on magnetic materials. Ceramic materials:- Types and application of different ceramics and their advanced types. Composite materials:- Types and their applications. Material Properties and Testing:- Elasticity, plasticity, ductility, Stiffness, malleability, fatigue, Toughness, creep, hardness etc.Material Testing methods, Non destructive testing methods.</p>
<p>General Principles of Design, Drawing, Importance of Safety</p>	<p>Design Process, Team Behavior, Problem Definition-Customer Requirements, Concept Generation, Decision Making & Concepts Evaluation, Embodiment Design, Detail Design, Introduction to Scales and Curves, Orthographic Projections, Isometric & Perspective Projections, Conventional Representation, AUTO CAD and Importance of Safety</p>

Subject	Syllabus
<p>Ethics and values in Engineering profession</p>	<p>Introduction to Ethics and Values in Engineering Profession, Moral Reasoning and Ethical Theories, Codes of Ethics, Engineering-Social Experimentation, Engineer’s Responsibility for Safety and Risk, Responsibilities and Rights of Engineers, Global Issues, Ethical Audit & Ethical Governance and Public Servants</p>
<p>Information and Communication Technologies (ICT) based tools and their applications in Engineering such as networking, e-governance and technology based education.</p>	<p>Information and Communication Technologies</p> <p>ICT & Networks: Introduction to ICT and Networks, Network Typologies: PAN, LAN, MAN,WAN, Internet; Modems, ASDL, Ethernet; Inter-networking: Repeaters, switches, routers, gateways, IPv4, IPv6;DNS, e-mail, WWW;</p> <p>Modern wireless technologies: RFID, Near Field Communication, Bluetooth, Wi-Fi, WIMAX, Li-Fi, White-Fi etc.</p> <p>Cellular Network Technologies: 1G,2G,3G,4G, 5G, GSM, CDMA, EDGE, GPRS, UMTS, LTE. Satellite technologies :types of satellite , orbits</p> <p>Cyber Security: Types, Threats: E-Mail Tracking , Social Engineering, Identity Theft, Phishing, Trojans, Backdoors, Viruses, Worms, DoS and DDoS Attacks, BOTs/BOTNETs; Defenses: Digital Signatures, Firewall, Virtual Private Networks (VPN) etc.;</p> <p>Computing: Parallel, Distributed, Grid, Cloud, Super computers etc</p> <p>Computer Data Storage Devices: Types and Technologies like magnetic storage devices, optical storage devices CD, DVD, Blu-ray Disc, USB Flash Drive etc,holostore</p> <p>Advanced Topics and Recent trends: Social networks, Big data, Project Loon, White Spaces, Internet of Things; Social Networking and its platforms like Facebook, Twitter, Google Talk, Skype and e-commerce; Internet Governance: Digital Divide, Net Neutrality, Internet.org;virtual reality , augmented reality ,software engineering ,</p> <p>Government Policies and Schemes on ICT.</p> <p>e -Governance and Technology based Education</p> <p>e-Governance: Meaning, Models, Scope, Advantages, Challenges; Good Governance and e-Governance; e-governance in India: NeGP, e-Governance Infrastructure, Gol Cloud Initiative – Meghraj; Digital India: Broadband Highways, e-Kranti, Digital Locker, BAS, eSign, National Digital Literacy Mission, Bharat Net (National Optical Fibre Network (NOFN)), e-Hospital, e-Education etc. eNAM, e-District, e-Haat;</p> <p>Technology based Education: Concept, mechanisms, merits and demerits; Applications; International practices like MOOC, Open Course Ware Consortium, Open Learn Project; ICT tools: MatLab, Mathematica, AutoCAD, SkyDrive, MS Office 365, Google Docs, etc.</p> <p>e-education in India: National Mission on Education through Information and Communication Technology (NMEICT), National Programme on Technology Enhanced Learning (NPTEL), e-Shodh Sindhu, Virtual Labs, EDUSAT, eBasta, Digital Library of India (DLI), National Digital Library(NDL), ENVIS, Indian Sign Language Education and Recognition System etc.</p>
<p>Standards and Quality practices in production, construction, maintenance and services</p>	<p>Introduction, Quality costs, Quality philosophy, Service Quality, Tools of Quality Control, Continuous Improvement Techniques, Maintenance, ISO and TQM & Construction Quality</p>

Syllabus for ESE-2018 (Prelims), Paper-2

Subject Name	Syllabus
Engineering Mathematics	Matrix theory, Eigen values & Eigen vectors, system of linear equations, Numerical methods for solution of non-linear algebraic equations and differential equations, integral calculus, partial derivatives, maxima and minima, Line, Surface and Volume Integrals. Fourier series, linear, nonlinear and partial differential equations, initial and boundary value problems, complex variables, Taylor's and Laurent's series, residue theorem, probability and statistics fundamentals, Sampling theorem, random variables, Normal and Poisson distributions, correlation and regression analysis.
Electrical Materials	Electrical Engineering Materials, crystal structures and defects, ceramic materials, insulating materials, magnetic materials – basics, properties and applications; ferrites, ferro-magnetic materials and components; basics of solid state physics, conductors; Photo-conductivity; Basics of Nano materials and Superconductors.
Electric Circuits and Fields	Circuit elements, network graph, KCL, KVL, Node and Mesh analysis, ideal current and voltage sources, Thevenin's, Norton's, Superposition and Maximum Power Transfer theorems, transient response of DC and AC networks, Sinusoidal steady state analysis, basic filter concepts, two-port networks, three phase circuits, Magnetically coupled circuits, Gauss Theorem, electric field and potential due to point, line, plane and spherical charge distributions, Ampere's and Biot-Savart's laws; inductance, dielectrics, capacitance; Maxwell's equations.
Electrical and Electronic Measurements	Principles of measurement, accuracy, precision and standards; Bridges and potentiometers; moving coil, moving iron, dynamometer and induction type instruments, measurement of voltage, current, power, energy and power factor, instrument transformers, digital voltmeters and multi-meters, phase, time and frequency measurement, Q-meters, oscilloscopes, potentiometric recorders, error analysis, Basics of sensors, Transducers, basics of data acquisition systems
Computer Fundamentals	Number systems, Boolean algebra, arithmetic functions, Basic Architecture, Central Processing Unit, I/O and Memory Organization; peripheral devices, data representation and programming, basics of Operating system and networking, virtual memory, file systems; Elements of programming languages, typical examples.
Basic Electronics Engineering	Basics of Semiconductor diodes and transistors and characteristics, Junction and field effect transistors (BJT, FET and MOSFETS), different types of transistor amplifiers, equivalent circuits and frequency response; oscillators and other circuits, feedback amplifiers.
Analog and Digital Electronics	Operational amplifiers – characteristics and applications, combinational and sequential logic circuits, multiplexers, multi-vibrators, sample and hold circuits, A/D and D/A converters, basics of filter circuits and applications, simple active filters; Microprocessor basics- interfaces and applications, basics of linear integrated circuits; Analog communication basics, Modulation and demodulation, noise and bandwidth, transmitters and receivers, signal to noise ratio, digital communication basics, sampling, quantizing, coding, frequency and time domain multiplexing, power line carrier communication systems.

Subject Name	Syllabus
Systems and Signal Processing	Representation of continuous and discrete-time signals, shifting and scaling operations, linear, time-invariant and causal systems, Fourier series representation of continuous periodic signals, sampling theorem, Fourier and Laplace transforms, Z transforms, Discrete Fourier transform, FFT, linear convolution, discrete cosine transform, FIR filter, IIR filter, bilinear transformation.
Control Systems	Principles of feedback, transfer function, block diagrams and signal flow graphs, steady-state errors, transforms and their applications; Routh-hurwitz criterion, Nyquist techniques, Bode plots, root loci, lag, lead and lead-lag compensation, stability analysis, transient and frequency response analysis, state space model, state transition matrix, controllability and observability, linear state variable feedback, PID and industrial controllers.
Electrical Machines	Single phase transformers, three phase transformers - connections, parallel operation, auto-transformer, energy conversion principles, DC machines - types, windings, generator characteristics, armature reaction and commutation, starting and speed control of motors, Induction motors - principles, types, performance characteristics, starting and speed control, Synchronous machines - performance, regulation, parallel operation of generators, motor starting, characteristics and applications, servo and stepper motors.
Power Systems	Basic power generation concepts, steam, gas and water turbines, transmission line models and performance, cable performance, insulation, corona and radio interference, power factor correction, symmetrical components, fault analysis, principles of protection systems, basics of solid state relays and digital protection; Circuit breakers, Radial and ring-main distribution systems, Matrix representation of power systems, load flow analysis, voltage control and economic operation, System stability concepts, Swing curves and equal area criterion. HVDC transmission and FACTS concepts, Concepts of power system dynamics, distributed generation, solar and wind power, smart grid concepts, environmental implications, fundamentals of power economics.
Power Electronics and Drives	Semiconductor power diodes, transistors, thyristors, triacs, GTOs, MOSFETs and IGBTs - static characteristics and principles of operation, triggering circuits, phase control rectifiers, bridge converters - fully controlled and half controlled, principles of choppers and inverters, basis concepts of adjustable speed dc and ac drives, DC-DC switched mode converters, DC-AC switched mode converters, resonant converters, high frequency inductors and transformers, power supplies.