



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






ESE - 2020 PRELIMS

Online Test Series

GENERAL STUDIES AND ENGINEERING APTITUDE

No. of Tests: 21

	ESE- 2020 Test Series
 Subject Wise Grand Tests	10
 Multi Subject Grand Tests	5
 Full Length Mock Tests	6

All tests will be available till ESE -2020 (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 06:00 pm on scheduled day

Test No	Subject Name	No. of Questions	Max Marks	Duration	Date of Activation
Test-01	Engineering Mathematics and Numerical Analysis	33	66	40 Min	23-09-2019
Test-02	Basics of Energy and Environment	33	66	40 Min	
Test-03	General Principles of Design, Drawing, Importance of Safety	33	66	40 Min	
Test-04	Ethics and values in Engineering profession	33	66	40 Min	
Test-05	Information and Communication Technologies (ICT)	33	66	40 Min	
Test-06	Engineering Aptitude covering Logical reasoning and Analytical ability	33	66	40 Min	
Test-07	Basics of Material Science and Engineering	33	66	40 Min	
Test-08	Standards and Quality practices in production, construction, maintenance and services	33	66	40 Min	
Test-09	Basics of Project Management	33	66	40 Min	
Test-10	Current Issues of National and International importance related to social, Economic and Industrial Development	33	66	40 Min	

Multi Subject Grand Tests

Test No	Subjects Names	No. of Questions	Max Marks	Duration	Date of Activation
Test-11	Basics of Energy and Environment + Engineering Aptitude covering Logical reasoning and Analytical ability	33	66	40 Min	23-09-2019
Test-12	Engineering Mathematics and Numerical Analysis + Current Issues of National and International importance related to social, Economic and Industrial Development	33	66	40 Min	
Test-13	Basics of Project Management + Basics of Material Science and Engineering	33	66	40 Min	
Test-14	Information and Communication Technologies (ICT) + General Principles of Design, Drawing, Importance of Safety	33	66	40 Min	
Test-15	Ethics and values in Engineering profession + Standards and Quality practices in production, construction, maintenance and services	33	66	40 Min	

Full Length Mock Tests(Paper-I)

Test No	Mock Names	No. of Questions	Max Marks	Duration	Date of Activation
Test-16	Full Length Mock Test-1	100	200	2 Hours	23-09-2019
Test-17	Full Length Mock Test-2	100	200	2 Hours	
Test-18	Full Length Mock Test-3	100	200	2 Hours	29-09-2019
Test-19	Full Length Mock Test-4	100	200	2 Hours	13-10-2019
Test-20	Full Length Mock Test-5	100	200	2 Hours	17-12-2019
Test-21	Full Length Mock Test-6	100	200	2 Hours	24-12-2019

Syllabus for ESE (Prelims), Paper-1

Subject Name	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 .</p> <p>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 Name	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 Name	Syllabus
Ethics and values in Engineering profession	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
Information and Communication Technologies (ICT) based tools and their applications in Engineering such as networking, e-governance and technology based education.	<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;</p> <p>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>
Standards and Quality practices in production, construction, maintenance and services	Introduction, Quality costs, Quality philosophy, Service Quality, Tools of Quality Control, Continuous Improvement Techniques, Maintenance, ISO and TQM & Construction Quality