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## SUBJECT WISE TESTS (PAPER - I)

- Each test carries 60 marks and 45 minutes duration.
- Each test consists of 30 questions and Carries two marks Each.

TEST No	TEST NAME : SYLLABUS	TEST STATUS
ME-01	<p><b>Basics of Energy and Environment :</b></p> <p><i>Energy- Basics of Environment Conservation</i>  <b>Energy:</b> Concept of Energy, Classification of Energy Resources , Energy Resources in India Energy Policies and Acts in India.  <b>Basics of Environment:</b> Components of Ecosystem, Ecosystem, Types of Ecosystem, Structure of Ecosystem, Terminology of Species, Nutrient Cycles.  <b>Conservation:</b>  <b>Biodiversity</b> - Types of Biodiversity, Value of Biodiversity, Loss of Biodiversity, Threat to Biodiversity, Conservation of Biodiversity, International &amp; National Policies of Biodiversity, International &amp; National Organizations related to Biodiversity, Acts related to biodiversity.  <b>Sustainable Development-</b> 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><i>Climate Change – Degradation– Pollution</i></p> <p><b>Climate Change:</b> Introduction- Basic of Climate Change-Green House Effect, Causes , Impacts. Ozone Depletion-Causes, Impacts , International &amp; National Measures to Control Ozone Depletion. Acid Rains-Causes, Effects, International &amp; National Measures to Control Climate Change.  <b>Degradation:</b> Deforestation-Causes, Impact, Preventive measures, Soil erosion-Causes, Impact, Preventive measures, Desertification-Causes, Impact, Preventive measures.  <b>Pollution:</b> 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.  <b>Environmental Impact Assessment(EIA):</b> Concept; Principles; Process; stakeholders; Projects requiring EIA; Social Impact Assessment; Merits and Demerits of EIA;</p>	Available Now
ME-02	<p><b>Standards and Quality practices in production, construction, maintenance and service :</b></p> <p>Introduction, Quality costs, Quality philosophy, Service Quality, Tools of Quality Control, Continuous Improvement Techniques, Maintenance, ISO and TQM &amp; Construction Quality</p>	Available Now

TEST No	TEST NAME : SYLLABUS	TEST STATUS
ME-03	<p><b>Engineering Mathematics and Numerical Analysis:</b>  Matrix theory, Eigen values &amp; 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>	Available Now
ME-04	<p><b>Basics of Project Management :</b>  <i>Introduction:</i> Project and project management, classification of project, project life cycle, tools &amp; 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  <i>Resource Allocation:</i> project crashing, resource leveling &amp; smoothing.  Project Monitoring &amp; Controlling: Monitoring tools, project controlling. Project Auditing &amp; Termination: Purpose of auditing-goals of the system, project termination (Closeout), project procurement and materials management.</p>	Available Now
ME-05	<p><b>Information and Communication Technologies (ICT):</b>  <i>Information and Communication Technologies</i>  <b>ICT &amp; Networks:</b> Introduction to ICT and Networks, Network Typologies: PAN, LAN, MAN, WAN, Internet; Modems, ADSL, Ethernet; Inter-networking: Repeaters, switches, routers, gateways, IPv4, IPv6; DNS, e-mail, WWW; <b>Modern wireless technologies:</b> RFID, Near Field Communication, Bluetooth, Wi-Fi, WIMAX, Li-Fi, White-Fi etc.  <b>Cellular Network Technologies:</b> 1G, 2G, 3G, 4G, 5G, GSM, CDMA, EDGE, GPRS, UMTS, LTE. Satellite technologies :types of satellite , orbits  <b>Cyber Security:</b> 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.  <b>Computing:</b> Parallel, Distributed, Grid, Cloud, Super computers etc  <b>Computer Data Storage Devices:</b> Types and Technologies like magnetic storage devices, optical storage devices CD, DVD, Blu-ray Disc, USB Flash Drive etc holostore  <b>Advanced Topics and Recent trends:</b> 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 ,  <b>Government Policies and Schemes on ICT.</b>  <b>e -Governance and Technology based Education</b>  <b>e-Governance:</b>  Meaning, Models, Scope, Advantages, Challenges; Good Governance and e-Governance;  <b>e-governance in India:</b> NeGP, e-Governance Infrastructure, GoI 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;  <b>Technology based Education:</b>  Concept, mechanisms, merits and demerits; Applications; International practices like</p>	Available Now

TEST No	TEST NAME : SYLLABUS	TEST STATUS
	MOOC, Open Course Ware Consortium, Open Learn Project; ICT tools: MatLab, Mathematica, AutoCAD, SkyDrive, MS Office 365, Google Docs, etc. <b>e-education in India:</b> 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.	
ME-06	<b>Ethics and values in Engineering profession :</b> 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.	Available Now
ME-07	<b>Engineering Aptitude covering Logical reasoning and Analytical ability :</b> Engineering Aptitude, Logical reasoning & Analytical ability.	Available Now
ME-08	<b>Basics of Material Science and Engineering:</b> <b>Crystal structures and Defects:-</b> 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. <b>Electrical Materials:-</b> 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. <b>Nano materials:-</b> definition, preparation and properties, Graphite, CNT, Fullerene, Graphene , Quantum dots and their properties and applications, MEMS, NEMS. <b>Iron-Carbon Diagram and Steel alloys:-</b> Basics of phase diagram, Types of steels and steel alloys, properties of steel <b>Polymers:-</b> Structure and Types of polymers, characteristics and applications of polymers. <b>Nuclear materials:-</b> Basics of Nuclear Physics (Fission, Fusion), applications. <b>Dielectric Materials:-</b> Polarization, dielectric strength, break down, polar, non polar solids, Ferroelectrics, Piezo electrics, pyro electrics and their materials and applications. <b>Magnetic Materials:-</b> 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. <b>Ceramic materials:-</b> Types and application of different ceramics and their advanced types. <b>Composite materials:-</b> Types and their applications. <b>Material Properties and Testing:-</b> Elasticity, plasticity, ductility, Stiffness, malleability, fatigue, Toughness, creep, hardness etc. Material Testing methods, Non destructive testing methods.	Available Now
ME-09	<b>General Principles of Design, Drawing, Importance of Safety :</b> 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.	Available Now

TEST No	TEST NAME : SYLLABUS	TEST STATUS
ME-10	<b>Current Issues of National and International importance related to social, Economic and Industrial Development:</b> 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 Children. International Issues: India's bilateral and Multilateral issues; UNO- Agencies, Funds; Economic Institutions-World Bank, IMF,WTO,ADB,AIIB; Agreements and Summits. Current Affairs	Available Now

## SUBJECT WISE TESTS (PAPER - II)

- Each test carries 100 marks and 60 minutes duration.
- Each test consists of 50 questions and Carries two marks Each.

TEST No	TEST NAME : SYLLABUS	TEST STATUS
ME-11	<b>Engineering Mechanics &amp; Strength of Materials :</b> <i>Engineering Mechanics:</i> Analysis of System of Forces, Friction, Centroid and Centre of Gravity, Dynamics; Stresses and Strains-Compound Stresses and Strains, Bending Moment and Shear Force Diagrams, Theory of Bending Stresses- Slope and deflection-Torsion, Thin and thick Cylinders, Spheres. <i>Strength of Materials:</i> Stresses and Strains-Compound Stresses and Strains, Bending Moment and Shear Force Diagrams, Theory of Bending Stresses-Slope and deflection Torsion, Thin and thick Cylinders, Spheres.	Available Now
ME-12	<b>Fluid Mechanics &amp; Hydraulic Machines :</b> <i>Fluid Mechanics:</i> Basic Concepts and Properties of Fluids, Manometry , Fluid Statics, Buoyancy, Equations of Motion, Bernoulli's equation and applications, Viscous flow of incompressible fluids, Laminar and Turbulent flows, Flow through pipes and head losses in pipes. <i>Hydraulic Machines:</i> Reciprocating and Rotary pumps, Pelton wheel, Kaplan and Francis Turbines, velocity diagrams.	Available Now
ME-13	<b>Basic Thermodynamics &amp; Heat transfer :</b> <i>Basic Thermodynamics:</i> Thermodynamic systems and processes; properties of pure substance; Zeroth , First and Second Laws of Thermodynamics; Entropy, Irreversibility and availability; ideal and real gases; compressibility factor; Gas mixtures. <i>Heat transfer:</i> Modes of heat transfer, Steady and unsteady heat conduction, Thermal resistance, Fins, Free and forced convection, Correlations for convective heat transfer, Radiative heat transfer – Radiation heat transfer coefficient; boiling and condensation, Heat exchanger performance analysis	Available Now

TEST No	TEST NAME : SYLLABUS	TEST STATUS
ME-14	<b>Power Plant Engineering :</b> Rankin and Braxton cycles with regeneration and reheat, Fuels and their properties, Flue gas analysis, Boilers, steam turbines and other power plant components like condensers, air ejectors, electrostatic precipitators and cooling towers – their theory and design, types and applications; Impulse and Reaction principles, Steam and Gas Turbines, Theory of Jet Propulsion – Pulse jet and Ram Jet Engines, Reciprocating and Rotary Compressors – Theory and Applications	Available Now
ME-15	<b>IC Engines :</b> Otto, Diesel and Dual Cycles. SI and CI Engines, Engine Systems and Components, Performance characteristics and testing of IC Engines; Fuels; Emissions and Emission Control.	Available Now
ME-16	<b>Design of Machine Elements :</b> Design for static and dynamic loading; failure theories; fatigue strength and the S-N diagram; principles of the design of machine elements such as riveted, welded and bolted joints. Shafts, Spur gears, rolling and sliding contact bearings, Brakes and clutches, flywheels.	Available Now
ME-17	<b>Refrigeration and Air conditioning :</b> Vapour compression refrigeration, Refrigerants and Working cycles, Compressors, Condensers, Evaporators and Expansion devices, Other types of refrigeration systems like Vapour Absorption, Vapour jet, thermo electric and Vortex tube refrigeration. Psychometric properties and processes, Comfort chart, Comfort and industrial air conditioning, Load calculations and Heat pumps.	Available Now
ME-18	<b>Manufacturing &amp; Engineering Materials :</b> <i>Manufacturing:</i> Metal casting-Metal forming, Metal Joining, Machining and machine tool operations, Limits, fits and tolerances, Metrology and inspection, computer Integrated manufacturing, FMS. <i>Engineering Materials:</i> Basic Crystallography, Alloys and Phase diagrams, Heat Treatment, Ferrous and Non Ferrous Metals, Non metallic materials, Basics of Nano-materials, Mechanical Properties and Testing, Corrosion prevention and control.	Available Now
ME-19	<b>Renewable Sources of Energy :</b> Solar Radiation, Solar Thermal Energy collection - Flat Plate and focusing collectors their materials and performance. Solar Thermal Energy Storage, Applications – heating, cooling and Power Generation; Solar Photovoltaic Conversion; Harnessing of Wind Energy, Bio-mass and Tidal Energy – Methods and Applications, Working principles of Fuel Cells.	Available Now
ME-20	<b>Industrial Maintenance Engineering :</b> Production planning and Control, Inventory control and operations research - CPM-PERT. Failure concepts and characteristics-Reliability, Failure analysis, Machine Vibration, Data acquisition, Fault Detection, Vibration Monitoring, Field Balancing of Rotors, Noise Monitoring, Wear and Debris Analysis, Signature Analysis, NDT Techniques in Condition Monitoring.	Available Now
ME-21	<b>Mechanisms and Machines :</b> Types of Kinematics Pair, Mobility, Inversions, Kinematic Analysis, Velocity and Acceleration Analysis of Planar Mechanisms, CAMs with uniform acceleration and retardation, cyclical motion, oscillating followers; Vibrations –Free and forced vibration of undamped and damped SDOF systems, Transmissibility Ratio, Vibration Isolation, Critical Speed of Shafts. Gears – Geometry of tooth profiles, Law of gearing, Involute profile, Interference, Helical, Spiral and Worm Gears, Gear Trains- Simple, compound and Epicyclic; Dynamic Analysis – Slider – crank mechanisms, turning moment computations, balancing of Revolving & Reciprocating masses, Gyroscopes –Effect of Gyroscopic couple of automobiles, ships and aircrafts, Governors	Available Now

TEST No	TEST NAME : SYLLABUS	TEST STATUS
ME-22	<b>Mechatronics and Robotics :</b> Microprocessors and Microcontrollers: Architecture, programming, I/O, Computer interfacing, Programmable logic controller. Sensors and actuators, Piezoelectric accelerometer, Hall effect sensor, Optical Encoder, Resolver, Inductosyn , Pneumatic and Hydraulic actuators, stepper motor, Control Systems- Mathematical modeling of Physical systems, control signals, controllability and observability. Robotics, Robot Classification, Robot Specification, notation; Direct and Inverse Kinematics; Homogeneous Coordinates and Arm Equation of four Axis SCARA Robot	Available Now

## MOCK TESTS (PAPER - I)

- Each test carries 200 marks and 120 minutes duration.
- Each test consists of 100 questions and Carries two marks Each.

TEST No	TEST NAME	TEST STATUS
ME-23	ESE - MOCK TEST - 1 (Paper - I)	Available Now
ME-24	ESE - MOCK TEST - 2 (Paper - I)	Available Now
ME-25	ESE - MOCK TEST - 3 (Paper - I)	Available Now

## MOCK TESTS (PAPER - II)

- Each test carries 300 marks and 180 minutes duration.
- Each test consists of 150 questions and Carries two marks Each.

TEST No	TEST NAME	TEST STATUS
ME-26	ESE - MOCK TEST - 1 (Paper - II)	Available Now
ME-27	ESE - MOCK TEST - 2 (Paper - II)	Available Now
ME-28	ESE - MOCK TEST - 3 (Paper - II)	Available Now