IES MASTER

Institute for Engineers (IES/GATE/PSUs)

ESE-2024 Conventional Test Schedule, Mechanical Engineering

Date	Topic
17 Mar 2024	**N.T.** : TH-1, TH-2, HT-1, RAC-1, MS-1, MS-2
	R.T. :
24 Mar 2024	**N.T.** : FMM-1, RAC-2, IE-2, RSE-1
	R.T. : TH-2, MS-1, HT-1
31 Mar 2024	**N.T.** : MECH-1, MECH-2, HT-2, RE-1
	R.T. : RAC-1, RAC-2, MS-2
07 Apr 2024	**N.T.** : FMM-2, PPE-1,RSE-2
	R.T. : HT-1, HT-2, TH-1, FMM-1, IE-2
14 Apr 2024	**N.T.** : ICE-1,ToM-2, MR-1
	R.T. : FMM-2, RSE-1, RSE-2, PPE-1
21 Apr 2024	**N.T.** : ToM-1, MR-2, PROD-1
	R.T. : MS-1, MECH-1, MECH-2,TH-1
28 Apr 2024	**N.T.** : IE-1, PPE-2, FMM-3,
	R.T. : PPE-1, MS-2, HT-1, PROD-1,ToM-1, ICE-1
05 May 2024	**N.T.** : PPE-3, PROD-2
	R.T. : RAC-1, RAC-2, RE-1, IE-1, MR-1, MECH-1
12 May 2024	**N.T.** : ToM-3, ICE-2
	R.T. : MR-2, RSE-1, RSE-2, HT-1, HT-2, FMM-2
19 May 2024	**N.T.** : RE-2, MD-1
	R.T. : PPE-1, PPE-2, FMM-3, ToM-2, ToM-3
26 May 2024	**N.T.** : Mech-3, MD-2
	R.T. : FMM-1, FMM-2, PROD-1, PROD-2, MECH-1, ICE-2, MD-1
02 June 2024	Full Length-1 (Test Paper-1 + Test Paper-2)
09 June 2024	Full Length-2 (Test Paper-1 + Test Paper-2)
16 June 2024	Full Length-3 (Test Paper-1 + Test Paper-2)

Test Type	Timing	Day
Conventional Test	10:00 A.M. to 1:00 P.M.	Sunday
Conventional Full Length Test Paper-1	10:00 A.M. to 1:00 P.M.	Sunday
Conventional Full Length Test Paper-2	02:00 P.M. to 5:00 P.M.	Sunday

Note : The timing of the test may change on certain dates. Prior information will be given in this regard.

*N.T. : New Topic. *R.T. : Revision Topic

Call us : 8010009955, 011-41013406 or Mail us : info@iesmaster.org

Subject Code Details

Thermodynamic	**TH-1**		**TH-2**
	Thermodynamic systems and processes; Zeroth, First and Second Laws of Thermodynamics. properties of pure substance.		Entropy, Irreversibility and availability; Real and Ideal gases; compressibility factor; Gas mixtures.
Heat Transfer	**HT-1**		**HT-2**
	Mode of Heat Transfer, Steady and unsteady heat conduction, Thermal Resistance, Fins, Radiative heat transfer.		Free and forced convection, boiling and condensation, Heat exchanger Performance Analysis.
IC Engines	**ICE-1**		**ICE-2**
	SI and CI Engines, Engine Systems and Components, Fuels.		Performance characteristics and testing of IC Engines; Emissions and Emission Control. Otto, Diesel and Dual Cycles.
Refrigeration Air Conditioning	**RAC-1**		**RAC-2**
	Vapour compression refrigeration, Refrigerants, Compressors, Other types of refrigeration systems like Vapour Absorption, Vapour jet, thermo electric and Vortex tube refrigeration and Heat pump.		Psychometric properties and processes, Comfort chart, Comfort and industrial air conditioning, Load calculations and Condensers, Evaporators and Expansion devices.
Fluid Mechanics and Machinery	**FMM-1**	**FMM-2**	**FMM-3**
	Basic Concepts and Properties of Fluids, Manometry, Fluid Statics, Buoyancy, Equations of Motion such as velocity potential, Stream Function.	Bernoulli's equation and applications, Viscous flow of incompressible fluids, Laminar and Turbulent flows, Flow through pipes and head losses in pipes.	Reciprocating and Centrifugal pumps, Pelton wheel, Kaplan and Francis Turbines and other hydraulic machines.
Power Plant Engineering	**PPE-1**	**PPE-2**	**PPE-3**
	Steam and Gas Turbines, Rankine and Brayton cycles with regeneration and reheat.	Fuels and their properties, Flue gas analysis, Theory of Jet Propulsion – Pulse jet and Ram Jet Engines, Reciprocating and Rotary Compressors.	Boilers, power plant components like condensers, air ejectors, Electrostatic precipitators and cooling towers - their theory and design, types and applications
Renewable Sources of Energy	**RSE-1**		**RSE-2**
	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.
Engineering Mechanics (SoM)	**Mech-1**	**Mech-2**	**Mech-3**
	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.
Engineering Materials	**MS-1**		**MS-2**
	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.
Mechanisms and Machines	**TOM-1**	**TOM-2**	**TOM-3**
	Type of kinematics pair, Mobility, Inversions, Kinematic Analysis, Velocity and Acceleration analysis of Planar Mechanisms. CAMs with uniform acceleration and retardation, cycloidal motion, oscillating followers; Effect of Gyroscopic couple on automobiles, ships and aircrafts. Governors.	Vibrations –Free and forced vibration of undamped and damped SDOF systems, Transmissibility Ratio, Vibration Isolation, Critical Speed of Shafts.	Geometry of tooth profiles, Law of gearing, Interference, Helical, Spiral and Worm Gears, Gear Trains- Simple, compound and Epicyclic. Slider crank mechanisms, Balancing of revolving and reciprocating masses.
Design of Machine Elements	**MD-1**		**MD-2**
	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.
Manufacturing, Industrial and Maintenance Engineering	**PROD-1**	**IE-1**	**RE-1**
	Metal casting-Metal forming, Metal Joining, computer Integrated manufacturing, FMS.	Production planning and Control, Inventory control	Failure concepts and characteristics-Reliability, Failure analysis, Machine Vibration, Data acquisition, Fault Detection, Vibration Monitoring.
	PROD-2	**IE-2**	**RE-2**
	Machining and machine tool operations, Limits, fits and tolerances, Metrology and inspection.	Operations research - CPM-PERT	Field Balancing of Rotors, Noise Monitoring, Wear and Debris Analysis, Signature Analysis, NDT Techniques in Condition Monitoring.
Mechatronics and Robotics	**MR-1**		**MR-2**
	Microprocessors and Micro controllers: 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 Physicalsystems, 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.