TELANGANA STATE POWER GENERATION CORPORATION LIMITED ASSISTANT ENGINEER

Online Test Series

Mechanical Engineering - Schedule

No.of Tests : 20	
Subject Wise Tests	15
Full Length Mock Tests	5

Note:

★ The Syllabus considered as per Notification of TSGENCO. ACE Engineering Academy does not take any responsibility for deviations in syllabus in the final exam. As per Notification of TSGENCO each question carries '1' mark.

★ The Dates of Tests may Change according to the TSGENCO-AE Exam schedule.

★ All Tests will be active till TSGENCO-AE Examination.

★ Tests will be activated at 06:00 pm on the scheduled day.

Subject-wise Tests
(No.of Questions: 30, Time duration: 36 Minutes and Max Marks: 30 M)

Test No	Name of the Test	Date of Activation
Test-01	Mechanics of Materials	14-10-2023
Test-02	Fluid Mechanics	16-10-2023
Test-03	Theory of Machines & Vibrations & Engineering Mechanics	18-10-2023
Test-04	Engineering Materials	20-10-2023
Test-05	Casting, Forming and Joining Processes & Machining and Machine Tool Operations Metrology and Inspection & Computer Integrated Manufacturing	22-10-2023
Test-06	IC Engines, Refrigeration and Air conditioning	24-10-2023
Test-07	Design of Machine Elements	26-10-2023
Test-08	Thermodynamics	28-10-2023
Test-09	Production Planning and Control & Inventory Control & Operations Research	30-10-2023
Test-10	Heat-Transfer	01-11-2023
Test-11	Basic Electrical Engineering	03-11-2023
Test-12	Power Plant Engineering	05-11-2023
Test-13	Telangana Culture, Movement. Post formation development of Telangana State.	06-11-2023
Test-14	General Awareness and English	07-11-2023
Test-15	Analytical & Numerical Ability and Basic knowledge of Computer for handling office works such as MS Office etc	08-11-2023

Full Length Mock Test Series
(No.of Questions: 100, Time duration: 120 Minutes and Max Marks: 100)

Test No	Name of the Test	Date of Activation
Test-16	Full Length Mock Test-01	09-11-2023
Test-17	Full Length Mock Test-02	13-11-2023
Test-18	Full Length Mock Test-03	17-11-2023
Test-19	Full Length Mock Test-04	21-11-2023
Test-20	Full Length Mock Test-05	25-11-2023

MECHANICAL ENGINEERING

Section –A Total 80 Marks

1.Engineering Mechanics:

Free-body diagrams and equilibrium; friction and its applications including rolling friction, belt-pulley, brakes, clutches, screw jack, wedge, vehicles, etc.; trusses and frames; virtual work; kinematics and dynamics of rigid bodies in plane motion; impulse and momentum (linear and angular) and energy formulations; Lagrange's equation.

2.Mechanics of Materials:

Stress and strain, elastic constants, Poisson's ratio; Mohr's circle for plane stress and plane strain; thin cylinders; shear force and bending moment diagrams; bending and shear stresses; concept of shear centre; deflection of beams; torsion of circular shafts; Euler's theory of columns; energy methods; thermal stresses; strain gauges and rosettes; testing of materials with universal testing machine; testing of hardness and impact strength.

3.Theory of Machines:

Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of linkages; cams; gears and gear trains; flywheels and governors; balancing of reciprocating and rotating masses; gyroscope.

4. Vibrations:

Free and forced vibration of single degree of freedom systems, effect of damping; vibration isolation; resonance; critical speeds of shafts.

5. Thermodynamics:

Thermodynamic systems and processes; properties of pure substance; Zeroth, First and Second Laws of Thermodynamics; Entropy, Irreversibility and availability; analysis of thermodynamic cycles related to energy conversion: Rankine, modified Rankine, Otto, Diesel and Dual Cycles; ideal and real gases; compressibility factor; Gas mixtures.

6. Fluid Mechanics:

Fluid properties; fluid statics, forces on submerged bodies, stability of floating bodies; control-volume analysis of mass, momentum and energy; fluid acceleration; differential equations of continuity and momentum; Bernoulli's equation; dimensional analysis; viscous flow of incompressible fluids, boundary layer, elementary turbulent flow, flow through pipes, head losses in pipes, bends and fittings; basics of compressible fluid flow.

7. Heat-Transfer:

Modes of heat transfer; one dimensional heat conduction, resistance concept and electrical analogy, heat transfer through fins; unsteady heat conduction, lumped parameter system, Heisler's charts; thermal boundary layer, dimensionless parameters in free and forced convective heat transfer, heat transfer correlations for flow over flat plates and through pipes, effect of turbulence; heat exchanger performance, LMTD and NTU methods; radiative heat transfer, Stefan- Boltzmann law, Wien's displacement law, black and grey surfaces, view factors, radiation network analysis.

8. Engineering Materials:

Structure and properties of engineering materials, phase diagrams, heat treatment, stress-strain diagrams for engineering materials.

9. Casting, Forming and Joining Processes:

Different types of castings, design of patterns, moulds and cores; solidification and cooling; riser and gating design. Plastic deformation and yield criteria; fundamentals of hot and cold working processes; load estimation for bulk (forging, rolling, extrusion, drawing) and sheet (shearing, deep drawing, bending) metal forming processes; principles of powder metallurgy. Principles of welding, brazing, soldering and adhesive bonding.

10. Machining and Machine Tool Operations:

Mechanics of machining; basic machine tools; single and multi-point cutting tools, tool geometry and materials, tool life and wear; economics of machining; principles of non-traditional machining processes; principles of work holding, jigs and fixtures; abrasive machining processes; NC/CNC machines and CNC programming.

11. Metrology and Inspection:

Limits, fits and tolerances; linear and angular measurements; comparators; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly; concepts of coordinate-measuring machine (CMM).

12. Computer Integrated Manufacturing:

Basic concepts of CAD/CAM and their integration tools; additive manufacturing.

13. Production Planning and Control:

Forecasting models, aggregate production planning, scheduling, materials requirement planning; lean manufacturing.

14. Inventory Control:

Deterministic models; safety stock inventory control systems.

15. Operations Research:

Linear programming, simplex method, transportation, assignment, network flow models, simple queuing models, PERT and CPM.

16. IC Engines, Refrigeration and Air conditioning:

SI and CI Engines, Engine Systems and Components, Performance characteristics and testing of IC Engines; Fuels; Emissions and Emission Control. Vapour compression refrigeration, Refrigerants and Working cycles, Compressors, Condensers, Evaporators and Expansion devices, other types of refrigeration systems like Vapour Absorption, Vapour jet, thermoelectric and Vortex tube refrigeration. Psychometric properties and processes, Comfort chart, Comfort and industrial air conditioning, Load calculations and Heat pumps.

17. Power Plant Engineering:

Basic power generation concepts, Steam Power Plants with Sub- critical, critical and super critical technology, Combustion Process, Gas Turbine Plant, Direct Energy Conservation, Hydro Electric Power Plant, nuclear & Power from Non-conventional sources, Power plant economics-Capital cost, Investment of fixed charges, operating cost, arrangements for power distribution, load curves, connected load, maximum demand, demand factor, average load, load factor, diversity factor, Environmental considerations- Effluents from Power Plants and impact of environment, Pollution

and pollution standards-Methods of pollution control , Power plant components-their theory and design, types and applications.

18. Design of Machine Elements:

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.

19.Basic Electrical Engineering:

Electrical Circuits-Basics, Ohm's Law, Kirchhoff' Law, Inductive & Capacitive Networks, Series & Parallel Circuits, Star & Delta Transformers, Instruments-Basic Principles of indicating instruments, PMMC & Moving Iron Instruments, DC Machines-DC Generator, DC motors and their applications, Transformers-Operation, EMF Equation, Losses, efficiency & Regulation, AC Machines-Operation of Synchronous and Induction motors, their Characteristics & applications, Basics of batteries and their uses.

Section –B Total 20 Marks.

General Awareness and Numerical Ability:
i)   Analytical & Numerical Ability
ii)   General Awareness
iii)   English
iv)   Telangana Culture, Movement. Post formation development of Telangana State.
v)   Basic knowledge of Computer for handling office works such as MS Office etc.