TELANGANA STATE POWER GENERATION CORPORATION LIMITED ASSISTANT ENGINEER

Online Test Series

Electronics 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: 30 Minutes and Max Marks: 30 M)

Test No	Name of the Test	Date of Activation
Test-01	Networks	14-10-2023
Test-02	Signals and Systems	16-10-2023
Test-03	Electronic Devices	18-10-2023
Test-04	Analog Circuits	20-10-2023
Test-05	Digital Circuits	22-10-2023
Test-06	Control Sytems	24-10-2023
Test-07	Communications	26-10-2023
Test-08	Electro magnetics	28-10-2023
Test-09	Materials Science	30-10-2023
Test-10	Basic Electrical Engineering	01-11-2023
Test-11	Electrical & Electronic Measurements	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: 100 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

SYLLABUS

ELECTRONICS ENGINEERING

Section –A Total 80 Marks

1. Networks, Signals and Systems:

Circuit analysis: KCL, KVL, Node and mesh analysis, superposition, Thevenin's theorem, Norton's theorem, reciprocity.

Sinusoidal steady state analysis: phasors, complex power, maximum power transfer. Time and frequency domain analysis of linear circuits: RL, RC and RLC circuits, solution of network equations using Laplace transform. Linear 2-port network parameters, wye-delta transformation.

Continuous-time signals: Fourier series and Fourier transform, sampling theorem and applications.

Discrete-time signals: DTFT, DFT, z-transform, discrete-time processing of continuous-time signals. LTI systems: definition and properties, causality, stability, impulse response, convolution, poles and zeroes, frequency response, group delay, phase delay.

2. Electronic Devices:

Energy bands in intrinsic and extrinsic semiconductors, equilibrium carrier concentration, direct and indirect band-gap semiconductors.

Carrier transport: diffusion current, drift current, mobility and resistivity, generation and recombination of carriers, Poisson and continuity equations. P-N junction, Zener diode, BJT, MOS capacitor, MOSFET, LED, solar cell, Laser, photo diode, Photo-resister and their characteristics, Basics of Fiber Optics.

3. Analog Circuits:

Diode circuits: clipping, clamping and rectifiers. BJT and MOSFET amplifiers: biasing, accoupling, small signal analysis, frequency response. Current mirrors and differential amplifiers.

Op-amp circuits: Amplifiers, summers, differentiators, integrators, active filters, Schmitt triggers and oscillators.

4. Digital Circuits:

Number representations: binary, integer and floating-point-numbers.

Combinatorial circuits: Boolean algebra, minimization of functions using Boolean identities and Karnaughmap, logic gates and their static CMOS implementations, arithmetic circuits, code converters, multiplexers, decoders.

Sequential circuits: latches and flip-flops, counters, shift-registers, finite state machines, propagation delay, setup and hold time, critical path delay. Data converters: sample and hold circuits, ADCs and DACs.

Semiconductor memories: ROM, SRAM, DRAM.

Computer organization: Machine instructions and addressing modes, ALU, data-path and control unit, instruction pipelining.

Microprocessor: 8086/8088 and Micro controller: 8051.

5. Control Sytems:

Basic control system components; Feedback principle; Transfer function; Block diagram representation; Signal flow graph; Transient and steady-state analysis of LTI systems; Frequency response; Routh-Hurwitz and Nyquist stability criteria; Bode and root-locus plots; Lag, lead and lag-lead compensation; State variable model and solution of state equation of LTI systems.

6. Communications:

Random processes: autocorrelation and power spectral density, properties of white noise, filtering of random signals through LTI systems.

Analog communications: Amplitude modulation and demodulation, angle modulation and demodulation, spectra of AM and FM, super heterodyne receivers.

Information theory: Entropy, mutual information and channel capacity theorem.

Digital communications: PCM, DPCM, digital modulation schemes (ASK, PSK, FSK, QAM), bandwidth, inter-symbol interference, MAP, ML detection, matched filter receiver, SNR and BER. Fundamentals of error correction, Hamming codes, CRC.

7. Electro magnetics:

Maxwell's equations: differential and integral forms and their interpretation, boundary conditions, wave equation, Poynting vector.

Plane waves and properties: reflection and refraction, polarization, phase and group velocity, propagation through various media, skin depth.

Transmission lines: equations, characteristic impedance, impedance matching, impedance transformation, S-parameters, Smith chart. Rectangular and circular waveguides, light propagation in optical fibers, dipole and monopole antennas, linear antenna arrays.

8. Basic Electrical Engineering:

Electro-magnetism, Faraday's & Lenz's laws, induced EMF and its uses; Single-phase AC circuits; Transformers, efficiency; Basics-DC machines, induction machines, and synchronous machines , Basics of batteries and their uses.

9. Materials Science:

Electrical Engineering materials; Crystal structure & defects; Ceramic materials-structures, composites, processing and uses; Insulating laminates for electronics, structures, properties and uses; Magnetic materials, basics, classification, ferrites, ferro/para-magnetic materials and components; Nano materials-basics, preparation, purification, sintering, nano particles and uses; Nano-optical/magnetic/electronic materials and uses; Superconductivity, uses.

10. 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.

11. Electrical & Electronic Measurements:

Static and dynamic characteristics of Measurement Systems. Error and uncertainty analysis. Statistical analysis of data and curve fitting. Bridges and potentiometers, measurement of R, L and C. Measurements of voltage, current, power, power factor and energy. A.C & D.C current probes. Extension of instrument ranges. Q-meter and waveform analyzer. Digital voltmeter and multi meter. Time, phase and frequency measurements. Cathode Ray Oscilloscope. Serial and parallel communication. Shielding and grounding. Transducers and their applications to the measurement of non-electrical quantities like temperature, pressure, strain, displacement liquid level. Measurement of pH, conductivity, viscosity and humidity.

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.