Annexure – II

Syllabus – Assistant Engineers (Elecl.,)

Part-A (80 Questions)

1.Electrical Circuits and Networks: Kirchhoffs laws, mesh and node analysis, network theorems, sinusoidal steady state analysis of single phase and three phase circuits, resonance, transient response of RL, RC, RLC Circuits for different input, two-port networks, Two element network synthesis. Measurement of power by two-wattmeter method; Fourier, Laplace and Z transforms

2. Control Systems: Modeling of physical system, Block diagrams and signal flow graphs, Time and frequency domain analysis, Steady state errors, Routh's criterion, Nyquist and Bode plots, compensation, root loci, elementary ideas of state variable analysis, control system components.

3. Measurements and Instrumentation: Measurement of current, voltage, power, power-factor and energy, Measurement of resistance, inductance, capacitance and frequency-bridge methods, transducers and their applications to the measurement of non-electrical quantities like temperature, pressure, strain, displacement etc., CRO.

4. Electrical Machines: Single phase transformer; equivalent circuit, tests, regulation and efficiency, three phase transformers connections, parallel operation, auto transformer, principle of energy, Conversion, windings of rotating machines, DC generator and motors, characteristics, starting and speed control, three phase induction motors performance characteristics, starting and speed control, single phase and three-phase induction motors, synchronous generators, performance, regulation, parallel operation, synchronous motors, starting characteristics and applications synchronous condensers, fractional horse power motors, permanent magnet and stepper motors

5. Power Systems: Electrical power generation thermal, hydro, nuclear, Types of Tariffs; transmission line parameters, steady state performance of overhead transmission lines and cables, surge propagation, distribution systems, insulators, bundle conductors, corana and radio interference effects, Sag and Tension, per-unit quantities, bus admittance and impedance matrices, load flow: voltage control and power factor correction, economic operation, Load Frequency Control, symmetrical components, analysis of symmetrical and unsymmetrical faults, principles of over-current, differential and distance protection, circuit breakers, concept of system stability, swing curves and equal area criterion, HVDC transmission

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6. Analog and Digital Electronics: Characteristics of diodes, BJT, FET, SCR, Amplifier biasing, equivalent circuit, frequency response, feed-back amplifiers, power amplifiers, oscillators, operational amplifiers and applications, wave shaping circuits, multiplexer, filp-flops, universal gates, combinational circuits, A/D and D/A converters, 8-bit microprocessor basics (8085), architecture, programming and interfacing.

7. Power Electronics & Drives: Semiconductor power diodes, transistors, thyristors, triacs, GTOs, MOSFETs and IGBTs - static characteristics and principles of operation; triggering circuits; phase control rectifiers; bridge converters - fully controlled and half controlled; dual converters, principles of choppers, inverters, cyclo-converters and ac voltage controllers. Four quadrant operation, Types of loads, Steady-state stability, Types of braking in dc & ac motors, Energy loss during starting and braking of dc and ac motors, Basic concepts of converter and chopper fed dc drives; V/f control of ac motors, chopper controlled rotor resistance and slip power recovery scheme.

8. Utilization: High frequency eddy current heating, dielectric heating, Arc furnace, electric arc welding & electric resistance welding, Illumination: Laws of illumination, MSCP, SV & MV lamps, Factory, street & flood lighting, Electric traction and track electrification, Speed-time curves, Tractive effort, Specific energy consumption, Mechanism of train movement, adhesive weight and coefficient of adhesion.

9. Switchgear protection: Principles of over current, differential and distance protections, circuit breaker, concept of system stability, swing curves and equal area criterion. Power System Operation & Control, Relays, Protection for Generator, Transformers, feeder and Busbars, Grounding, Protection against Over Voltages, Batteries and Battery Chargers.

10. Electricity Act' 2003 and Indian Electricity Rules.

11. Non-Conventional Energy: Solar, Wind and Bio-mass.

Part-B (20 Questions)

Sl.No.	Particulars of the section	Weightage
1.	Numerical Ability (Indices, Ratios, Proportions, Profit & Loss, Menstruation, Algebra, Geometry and Statistics)	**20 Questions**
2.	Language proficiency (Vocabulary, Sentence corrections, Reading comprehension).	
3.	Computer Awareness	
4.	General Knowledge	
5.	Socio-economic, Political and Cultural History of Telangana with special emphasis on Telangana Statehood Movement and formation of Telangana state.	

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