FURTHER DETAILS REGARDING MAIN TOPICS OF PROGRAMME NO. 10/2013 (Item No. 6)

OVERSEER GR-I (ELECTRICAL)

(Special Recruitment for SC/ST only)

KERALA TOURISM DEVELOPMENT CORPORATION LTD.

(CATEGORY NO. 677/2012)

1. Basics of Electrical Engineering

Supply sources -DC, AC, Electrical circuits with resistance, inductance and capacitance. Power, power factor and energy.
Electrostatics-Permittivity, laws, definitions, different type capacitors.
Magnetism and electromagnetism - magnetic properties, magnetic circuits and laws.
Electrical measurement-Voltage, current, power and energy.
DC **machines**- principle, classification and application.
Electrical wiring- types, accessories and earthing.

2. Machines

DC machines -generator types, construction, emf equation, windings, characteristics armature reaction, commutation, trouble shooting and application.
DC motor-voltage equation, speed and torque, starting methods speed control, starters.
Transformer-single phase and three phase-equivalent circuits, phasor diagrams, tests. regulation and efficiency, connections, parallel operation, autotransformer-principle.
Induction motor- Squirrel cage and slip ring , principle and operation, slip, rotor current frequency and rotor emf.
Torque- equation, max torque, characteristics, power stages, equivalent circuits.
Speed control-starting methods, starters and applications.
Synchronous Generator- construction- salient pole & non salient pole, excitation methods. emf equation, .armature reaction, armature reactance, leakage reactance, circle diagram Vector diagram, voltage regulation, cooling system.
Synchronous Motor- methods of starting, characteristic, application, Phaser diagram. hunting.

3. Power system

Power Generation- Types-hydel, thermal, nuclear, layouts, sight selection, advantages and disadvantages of different systems.
Transmission -line constants, line insulators, string efficiency, sag, skin, corona and Ferranti effect and DC transmission system. Cables-terms and definitions, types.
Distribution- systems, over head-Radial, ring. & inter connected.
Protection -primary and secondary, fuses - terms and definitions, types. Circuit breaker-.principle, operation and types. Protection of alternator, transmission line and neutral earthing.
Utilisation -electric heating- materials advantages, types, devices.
Electrical welding- principle and types.
Traction- terms, definitions, speed time characteristic, tractive effort, efficiency.
Electric Braking- Methods, advantages and applications.

4. Measurements & Estimating

Electrical measuring Instruments -Function, terms and definitions. Principle of operation. construction and application. Instruments used for current, voltage, power, power factor, frequency and energy measurements.
Digital instruments- Digital voltmeter, digital multimeter, and cathode ray oscilloscope (CRO).wave analyser, spectrum analyser
Transducers and gauges- semiconductor strain gauge, LVDT, burden tube, capacitor transducer, piezo electric transducer, bellows.
Illumination- terms and definitions, laws of illumination, lighting schemes, design and calculation. Bus-bar design, industrial electrification.
Lamps- different types, construction, connection diagram .working, applications.
IS code and I E rule.

5. Electronics and Operational amplifier

Transistor-characteristics, configuration and application..equivalent circuits .h- parameters
Amplifier- classification, working, circuit diagram and application.
Oscillator - negative feed back.concept of Barhusins's criteria, types,.
Multi Vibrates- types, circuit diagram and application.
Number system- conversion of decimal, octal and hexa decimal in to binary and vice versa.
Binary- addition, subtraction and division.BCD addition
Systems of signed binary number- true magnitude form. 1 "s complement. 2,s complement
Logic gates- basic logic gates, verification of Truth table. Boolean algebra, axioms and postulates, universal logical gates. K- Map, Dc Morgan's theorem, half adder, full adder. multiplexing and demultiplexing.
Flip flop -circuit, and clocked flip -Hops circuits.
Operational amplifier - working, characteristic and applications.

6. Power Electronics and Microcontroller

UJT, FET, Diac, Triac, SCR - principle, construction, operation and characteristic,
Electric Drives- DC, single phase, semi converter, single full converter, and single phase duel converter.
Speed control of 3 phase induction- stator control, voltage and frequency.
Micro controller-8051 microcontrollers features, block diagram, architecture, register structure, special function registers, internal and external memory, pin details, ports, counters and timers in 8052. Serial I/O s, associated registers, interrupts.
PLC- applications, importance, block diagram, operation, types of PLC s, programming methods, ladder diagram.

NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper.