

APPENDIX – “C”

SYLLABUS FOR WRITTEN TEST FOR RECRUITMENT TO THE POST OF JUNIOR ENGINEERS (ELECTRICAL) IN WEST BENGAL SUBORDINATE SERVICE OF ENGINEERS

Materials : Conducting, Magnetic, Insulating, Contact, fuse materials, semi conductor.

ELEMENTARY CIRCUIT ANALYSIS :

D.C. Circuit : Star-delta conversion, Thevenin's theorem, Norton's theorem, Superposition theorem.

A.C. Circuit : Single Phase R, L & C Series, Parallel : resonance.

Three Phase : Star & delta connection, three phase 4 wire, neutral current measurement.

Measuring Instruments : D.C. & A.C. Ammeter & Voltmeter; A.C. Wattmeters, Energy meters, Frequency meters, Reactive power measurement, maximum demand indicator; testing & errors of energy meters, Megar Insulation Tester, Earth Megar Tester.

Power Factor : Effects of low power factor; methods of improving power factor.

Motors : Type of D.C. Motors – Speed Control; Induction motors; Different types of starters D.C. & A.C.; Applications of different motors – D.C. & A.C. (single phase, three phase); Selection of motors for various types of load.

Transformers : Single phase, Three phase connection, methods of cooling, oil testing, properties, Auto-transformers, Parallel operation.

O.H. Line : Conductors : Types of poles, stays & struts, type of insulators and their applications; Feeders, distributors, service mains, radial & ring main feeder; primary & Secondary distribution of single phase and poly phase system; line sag on level ground.

Cable : P.I.L.C. & P.V.C. cable, methods of cable laying; cable rating & devating factor.

Protective Devices : Fuses – fuse elements, types; current limiting reactors; Thermal, electromagnetic, Induction type relays; Types of Circuit breakers to principle of operation, Isolators.

Earthing : Domestic installation & motors; pole earthing, Earth resistance measurement; Horn gap & thyrite type lightning arrestor.

Design, Estimating : Design of lighting Scheme in a hall, class room, workshop, electrical installation of machines in a small workshop, estimation of house service connection; design of small transformers upto 100 VA; Rate analysis factor governing it – specification & schedule of work.

Battery : Types of storage battery, different elements, charging methods, maintenance.

Generation : Various conventional & non-conventional sources of energy. Different tariff systems and bill calculation.

Electronics : Different types of transistors – their biasing & action; Amplifier – single stage transistor, multistage. Definition of gain, frequency response, bandwidth. Voltage & power amplifier difference; transformer coupled Class-B push-pull amplifier – advantages & disadvantages, uses, Feed back in amplifier.

Oscillator : Types; functions of filter circuits; different rectifier circuit. Indian Electricity Rules. Extra high voltage, High voltage Switchgears protections. Pumps, lifts, Air-conditioning–Basic principle of operation safety & control.

Conservation of Energy – G.L.S. Lamp – Energy Efficient Lamp. Illumination – Level of Illumination & Measuring.
