

Appendix II
Examination Syllabus for
Examination for Registration as a Grade B Electrical Worker

1. General Knowledge and Electrical Engineering Theories

- a) Familiarization of the Code of Practice for the Electricity (Wiring) Regulations and other relevant local legislative regulations and Electricity Ordinance such as obligations of electrical contractors and workers, registration requirements etc.
- b) Electrical circuit theories such as Ohm's Law, Kirchhoff's Laws, Thevenin's Theorem, star-delta transformation etc. Basic Principles of Alternating Current (a.c.) such as rms and average values of a.c. waveforms; power factor improvement; active and reactive power of a.c. circuits.
- c) Circuit calculations on d.c. and a.c. circuits comprising circuit elements such as resistance, inductance and capacitance; single-phase and three-phase circuits calculations; relationships between line and phase voltages in star-connected and delta-connected system.

2. Cables/Overhead Lines, Wiring Enclosures, Protective Devices/Conductors and Circuit Arrangement

- a) Application, characteristics, sizing and selection of different types of cables/overhead lines, voltage drop calculation; correction factors for groups of cables; cable bends and supports; cable jointing and termination; overhead lines clearance.
- b) Protection of cables/busbars against electromechanical and mechanical stresses; PVC and metallic conduits; trunkings; bends and supports.
- c) Overcurrent and earth fault protection, simple fault calculation for determining the rating of protective devices; operating principle, characteristics and application of different types of protection devices such as relays and switchgears on different types of electrical installation; protection against electric shock from direct and indirect contact; earthing arrangements, equipotential bondings and earthing electrodes; co-ordination and discrimination of protective devices.
- d) Categories and segregation of circuits; arrangement of final circuits feeding different types of socket outlets; circuit arrangements for specific types of installations such as bathroom, kitchens, busbar trunking, rising mains, temporary supply etc.; metering arrangement.

3. Transformers and Electrical Machines

- a) Application, principles and characteristics of different types of power transformers; simple calculation on voltage regulation, losses and parallel operation of transformers; terminal markings standard, winding connection and vector groups of three-phase transformer.
- b) Applications, principle of operation, characteristics and starting methods of different types of electrical machines such as synchronous machines, induction machines, d.c. machines etc.

4. Lighting

Application of different types of interior and exterior lighting equipments; characteristics and control gears of different types of lamps such as incandescent lamp, fluorescent lamp, sodium lamp etc.; installation and wiring of lighting equipments; stroboscopic effect.

5. Inspection, Testing & Commissioning

- a) Functional checks, various testing methods and commissioning test on different types of electrical installations such as transformers, generators, motors, cables/overhead lines, capacitors, switchgears, protective device etc.
- b) Types of tests and regulations required for a completed installation, major alternation of an existing installation and the periodic inspection.

Reference : Code of Practice for the Electricity (Wiring) Regulations, other related regulations, local Supply Rules, Electrical Engineering Handbook, relevant international standards and publications in connection with electrical installations.