UNIT MERINYU ELEKTRIK

ELECTRICAL INSPECTORATE UNIT

SYLLABUS FOR CHARGEMAN EXAMINATION – Updated 04/2014

1. CATEGORY L1

A. THEORY

1.1 Electricity Ordinance.

1.2 Electrical Rules 1999.

1.3 Latest IEE Wiring Regulation or Malaysian Standard (MS).

1.4 Fire Fighting System.

- Selection and operation of portable fire extinguisher.
- Halon gas system and sprinkler.
- Alarm system.

1.5 Protection Equipment In Low Voltage Installation.

- All kinds of circuit breaker (ACB, OCB, MCCB, MCB, ELCB, etc).
- Safety switches.
- All kinds of fuse: rewiring fuse, HRC, time lag fuse, etc..
- Oil dashpot.
- Earthling.

1.6 Electrical Basic

- Power factor (p.f.)
  - definition and power factor calculation
  - effects of low power factor.
  - capacitor rating for power factor correction.
- Voltage.
- Current (DC circuit and AC circuit)
- Power (kW, kVA, kVAR).
- Resistor.
- Capacitor.
- Inductor.
- Magnetism basic.

1.7 Transformer

- Construction, types, application, differences between other types of transformer.
- Function of important parts in a transformer.
- Overhauling.
- Testing and commissioning.

1.8 Cable

- Cable selection.
- - types, sizes, current rating, voltage drop.
- Joints and terminations.
- Damages on cable and damage analysis.
- Usage of equipment to detect cable damages.

1.9 Underground Cable

- Types of cable, sizes, current rating.
- Digging, excavation and cable laying, and other situations.
- Cable jointing, phasing and termination
- Associated control gears, feeder pillar, distribution boards.
- Construction, operation and maintenance.

1.10 Motor and Controlling equipment

- Types of motor, application, differences and ways of operation.
- Maintenance, fault detection and repair.
- Starter including protection characteristics.

1.11 Battery

- Working principal.
- Types, sizes, maintenance and charge system.

1.12 Measurement and Testing Equipment

- Introduction and usage of different types of measurement and testing equipment.

1.13 Air Conditioner

- Types of air conditioner.
- Air conditioner components.
- Operation and maintenance.

1.14 Main Switch Board Equipment Checking

- Earthling system, OCB, switch board, switching tripping equipment, partition, relay and pilot wiring, etc..

1.15 Consumer Installation

- Design and types of consumer installation wiring.
- Earthling.
- Installation testing (testing procedure)
- Neon lamp installation.

1.16 Street Lighting

- Installation, maintenance.

1.17 Grid Connected Photovoltaic (PV) System

- Requirement to install disconnector switch (isolator) outside the premises.
- Knowledge of SESCO switching coordination operating practices.

B. PRACTICAL

1. **Instrument and Measurement.**
2. **Switchboard Operation.**
3. **Motor Control.**

2. CATEGORY L2	3. CATEGORY L3
A. THEORY	**A. THEORY**
2.1 Low voltage Overhead lines, Underground cable laying & auxilliaries • Types of poles, construction of stay wire • Types of cable, current rating. • Overhead line installation including tensioning, sagging and clearance limits. • Overhead line equipment like pole fuses, lightning arrestors, D bracket. • Installation and maintenance of overhead line equipment and others like feeder pillars and distribution boards. • Earthling. • Span length and poles location. • Street lighting. • Safety procedure when working. **2.2 Grid Connected Photovoltaic (PV) System** • Requirement to install disconnector switch (isolator) outside the premises. • Knowledge of SESCO switching coordination operating practices.	**3.1 Low voltage generating stations.** **3.2 Synchronizing power generation and purpose of synchronizing.** **3.3 Factors related to synchronizing process.** **3.4 Synchronizing operation (in theory and practical).**
4. CATEGORY H1	**5. CATEGORY H2**
A. THEORY	**A. THEORY**
4.1 Voltage Higher Than Low Voltage (up to 33 kV) Electrical Substation & auxilliaries.	**5.1 Voltage Higher Than Low Voltage (up to 33 kV) System for all the items listed in category L2.**
6. CATEGORY H3	
A. THEORY	
6.1 Voltage Higher Than Low Voltage (up to 33 kV) System for all the items listed in category L3.	