



Electrical Fundamentals

Components/Objectives

Residential Switch

- One way two terminals (SPST) switch
- One way three terminal switch or two way switch
- Intermediate switch
- Control a lamp from one location
- Control multiple lamps from one location
- Control multiple lamps from multiple locations
- Control a lamp from multiple locations
- Control a lamp from more than two locations

MCB

- Familiarization of MCB
- Recognize internal part of MCB
- Understand the operation of MCB
- Short circuit protection by an MCB
- Overload protection by an MCB
- Understand the time-current characteristics of MCB's

DC Generator

- Components of a DC generator
- Open Circuit Characteristics (O.C.C) of DC generator
- Internal characteristics of DC generator
- External characteristics of DC generator

AC Synchronous Generator

- Principles of Synchronous AC generator
- Components of Synchronous AC generator
- Synchronous AC generator output frequency and amplitude
- Open Circuit Characteristics (O.C.C) of Synchronous AC generator
- Short Circuit Characteristics (S.C.C) of Synchronous AC generator
- Excitation of Synchronous AC generator

Digital Clamp Meter

- Principles of clamp meter
- Components of clamp meter
- Operation of clamp meter
- AC current measurement
- AC voltage measurement
- DC voltage measurement
- Resistance measurement
- Diode check
- Continuity check

Commercial Mechanical Switches

- Familiarization with commercial switch types
- On-Off control of a load from one location using SPST switch
- On-Off control of two different loads from one location using DPST switch
- Select operation (On-On) of two different loads from one location using SPDT switch
- Control forward and reverse operation of a DC motor using DPDT switch

Commercial Mechanical Switches (cont)

- Select operation (On-Off-On) of two different loads from one location
- Select operation (on-Off-On) of two individual load and monitor the status using pilots lamps from the remote location
- Momentary control of a load from one location using push button switch

Digital Multimeter

- Overview of digital multimeter (DMM)
- DMM safety standard
- Measurement functions of DMM
- Understanding count, resolution, and accuracy
- Using DMM to do voltage measurement
- Using DMM to do current measurement
- Using DMM to do resistance measurement
- Using DMM to do diode measurement
- Using DMM to do continuity measurement
- Using DMM to do capacitance measurement
- Using DMM to do frequency measurement

Analog Multimeter

- Overview of analog multimeter
- Analog multimeter safety standard
- Measurement functions of analog multimeter
- Zeroing analog multimeter pointer to the calibrated scale
- Using analog multimeter to do voltage measurement
- Using analog multimeter to do current measurement
- Using analog multimeter to do resistance measurement
- Using analog multimeter to do diode measurement
- Using analog multimeter to do capacitance measurement

Relay

- Familiarization of relays
- Recognize internal parts of relays
- Understand the switching mechanism of relays
- Understand the method to energize a relay
- Understand terms and characteristics of relays
- Using relay to control operation of electrical load

Magnetic Contactor

- Definition of a magnetic contactor
- Construction of a magnetic contactor
- Main parts of a magnetic contactor
- Working principle of contactors
- Understanding wiring diagram of magnetic contactor
- Connecting of magnetic contactor according to the control and power wiring diagrams

Electromagnetism

- Magnetism
- Classification of magnetic substances
- Magnetic flux
- The magnitude of magnetism
- Electromagnetism
- Electromagnetic induction

OHM's Law, Voltage, Current and Resistance

- Understand the concept of voltage, current, and resistance
- Understand the relationship of voltage, current, and resistance
- Understand the application of OHM's law

Moving Iron Instrument

- Introduction to moving iron instruments
- Principle of attraction type moving iron instruments
- Principle of repulsion type moving iron instruments
- Parts of attraction type moving iron instruments
- Parts of repulsion type moving iron instruments

Moving Coil Instrument

- Introduction to moving coil instruments
- Principle of moving coil instruments
- Voltage measurement with moving coil instruments
- Application of multiplier resistor in voltage measurement
- Current measurement with moving coil instrument
- Application of current shunt in current measurement

Residential Wiring

- Familiarization with a house wiring diagram and electrical circuits in residential houses
- Identify wiring size according to electrical load for the circuit
- Identify electrical components used in residential houses
- Understand electrical wiring diagrams of sub-circuits
- Understand connections of wall switches in residential houses
- Understand connections of wall sockets in residential houses