Uses of Electrical and Electronic Knowledge in Daily Life

Chapter 1

Learning Objectives

01. To understand how to use electricity wisely.
02. Identify electrical hazards and gain awareness of accidents due to an electric shock. Electricity is undoubtedly one of the most basic needs in modern life.

Electricity is an invisible form of energy; a good servant but improper use can cause dangerous results.

Electrical Hazards

An electrical hazard is a dangerous situation which can happen if a person comes into direct contact with energised equipment, a conductor, or is in danger of doing so.

There are three major electrical hazards

Electric Shock

Electric Burns

Explosions Triggered by Electricity

Figure 1.1

Three primary factors have been identified as the key factors which effect the level of danger to a person, when he or she is exposed to an electric circuit:

- The amount of electricity which is flowing through the body.
- The path of the current flowing through the body.
- The length of time which the person is electrocuted.

Signage or pictorial representations related to electrically hazardous locations:

Figure 1.2

How can we prevent Electrical Hazards?

Figure 1.3

Electrical Technology

Chapter 2

Learning Objectives

01. Identify the process of electrical wiring of a house.
02. Understand the functionality of house wiring fixtures.

House Wiring Systems

An electrical house wiring system is more than just a collection of wires. It is a complex system, carefully designed to deliver all the power you need for modern life in the safest possible way.

Overcurrent Protection Devices

Overcurrent Protection devices are meant to protect against the potentially dangerous effects of overcurrents which can be generated by overloads, short – circuits or ground faults, which creates a faulty current.

Most Commonly used Protective Devices

1. **Surge Protection Device (SPD)**
   This device is a well-organised kind of an over-voltage protective device. SPD was invented to protect electrical systems and equipment from surge events, by limiting transient voltages and diverting current surges, which can originate externally and most intensely by lightening, or internally, by the switching on of electrical loads.

Figure 2.1

2. **Main Switch**
   The main switch is the main circuit breaker for the total electricity supply. It can break the connections of both the live and neutral wires at the same time. This protects electrical appliances from accidental damages due to electrical faults.

Figure 2.2

3. Trip Switch

A trip switch is a safety switch which is designed to shield people from electrocution and electric fire. If there is a fault in any of the circuits in the house, or if a person gets an electric shock, or a current leakage occurs in an appliance, this switch opens (Trip) automatically and disconnects the power supply. Trip switches are most likely to be in the up position when they are ON and in the down position if they have been tripped.

Figure 2.3

4. Circuit Breaker

These are automatically operated electrical switches, that protect electrical circuits from over loading or short circuiting. Circuit breakers detect faults and then stop the flow of current.

Figure 2.4

Installation of accessories during House Wiring

1. Surge protection device.
2. Main switch.
3. Trip switch.
4. Circuit breaker.
5. Socket outlet / switch.
6. Lamps / fans.

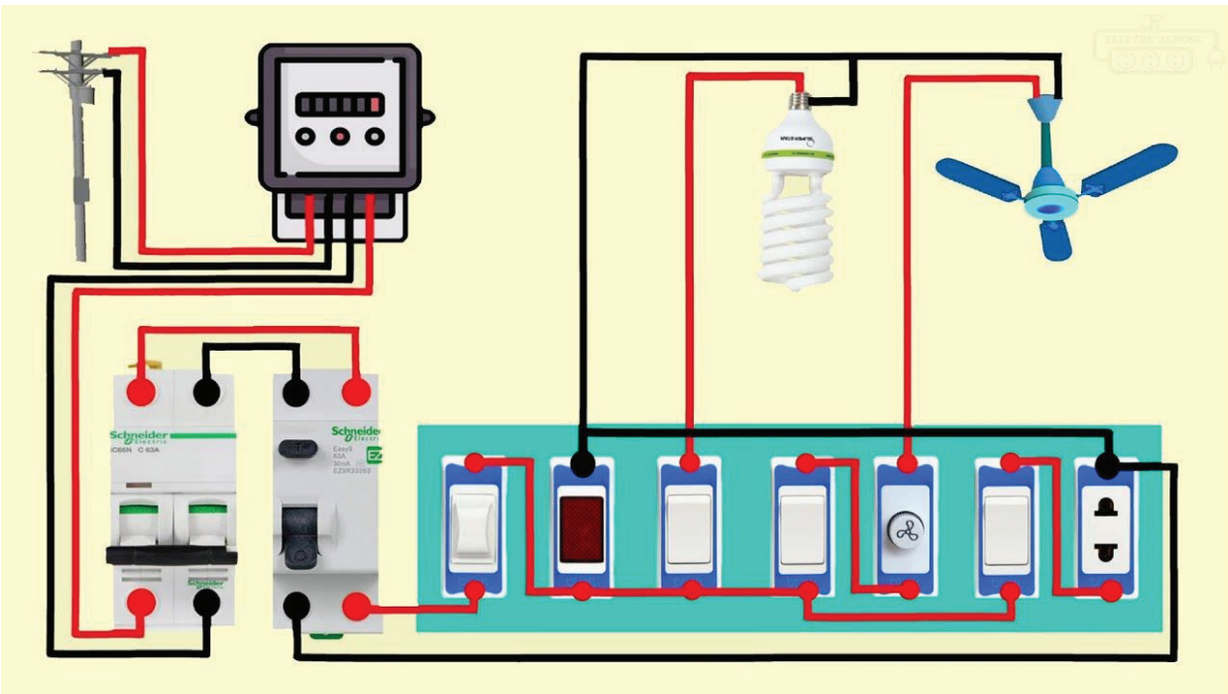

Figure 2.5