

### **UNIT 3: WIRING, GROUNDING AND SAFETY**

#### **Two-Mark Questions:**

1. **What are the general rules for electrical wiring?**
2. **Explain the types of wiring used in residential buildings.**
3. **What is the importance of proper grounding in electrical systems?**
4. **Describe the different types of grounding used in electrical systems.**
5. **What is the function of an earth leakage circuit breaker (ELCB)?**
6. **What are the materials commonly used for electrical wiring?**
7. **How does conduit wiring work, and what are its advantages?**
8. **Explain the design of residential wiring using the DT concept.**
9. **What are the causes of electrical accidents?**
10. **What safety measures should be taken during electrical installation?**
11. **Explain the role of fuses and circuit breakers in electrical safety.**
12. **How is a wiring layout designed for a residential building?**
13. **Why is earthing required in electrical systems?**
14. **What is the significance of insulation resistance in wiring?**
15. **How does a switchboard function in an electrical distribution system?**
16. **What is the role of a grounding electrode in electrical safety?**
17. **What are the types of safety switches used in residential wiring?**
18. **What are the types of wiring accessories commonly used?**
19. **What is a ring main system in wiring?**
20. **What is the role of an isolator in electrical systems?**
21. **What are the common materials used for earthing?**
22. **Explain the importance of overcurrent protection in electrical systems.**
23. **How do RCDs (Residual Current Devices) improve electrical safety?**
24. **What are the advantages of using PVC-insulated cables?**

25. **How is the fault current calculated in a grounded electrical system?**

**Problems:**

1. **Problem 1:**

Design a simple residential wiring layout for a two-room house with a kitchen, including the number of switches, outlets, and lighting circuits.

2. **Problem 2:**

Given a building with a total load of 5 kW, calculate the required wire size and current for the main circuit, assuming a voltage of 220 V and a power factor of 1.

3. **Problem 3:**

A house uses a 30 A fuse in the main circuit. Calculate the fault current if the line impedance is  $0.1 \Omega$ .

4. **Problem 4:**

A house is grounded using a copper rod of 2 m length and 12 mm diameter. Calculate the resistance of the ground if the soil resistivity is  $1.5 \Omega \cdot \text{m}$ .

5. **Problem 5:**

Calculate the total current drawn by a household with 10 lights, 5 fans, and 3 AC units, each with a known power rating, and determine the appropriate fuse rating for the distribution panel.