Digital Content on Advance Electricity (66732)

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Welcome To My Class

Chapter- 01

Electrical Wiring

House Wiring

Electrical wiring is generally refers to insulated conductor used to carry current and associated device. This article describes general aspects of electrical wiring as used to provide power in buildings and structures, commonly referred to as building wiring.

Wiring

Types of wiring according to uses

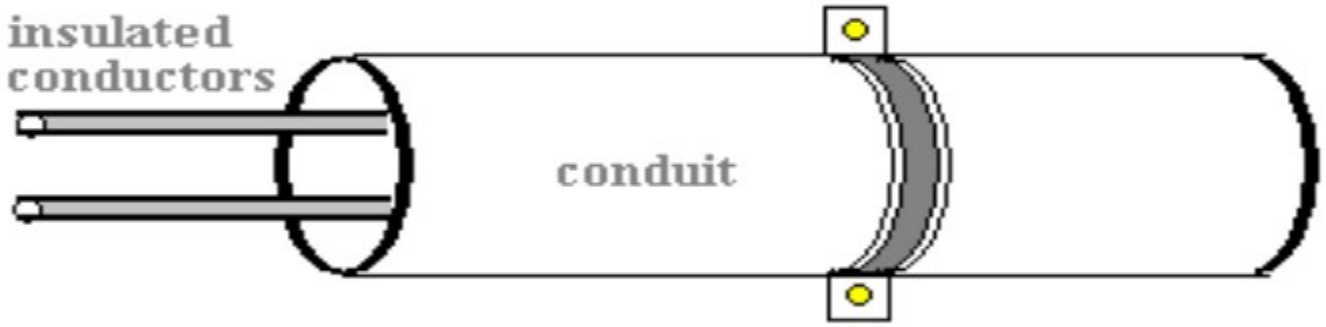
- **1. Domestic, wiring.**
- **2. Commercial, wiring.**
- **3. Industrial, wiring.**

Types of Wiring

- **Cleat, wiring**
- **CTS wiring or TRS wiring or batten wiring**
- **Metal sheathed, wiring or lead sheathed wiring**
- **Casing and capping**
- **Conduit wiring**

Casing wiring

Conduit Wiring



CONDUIT WIRING

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Chapter- 02

Different Types of Electric Lamps

Tubelight

Fluorescent tube's components

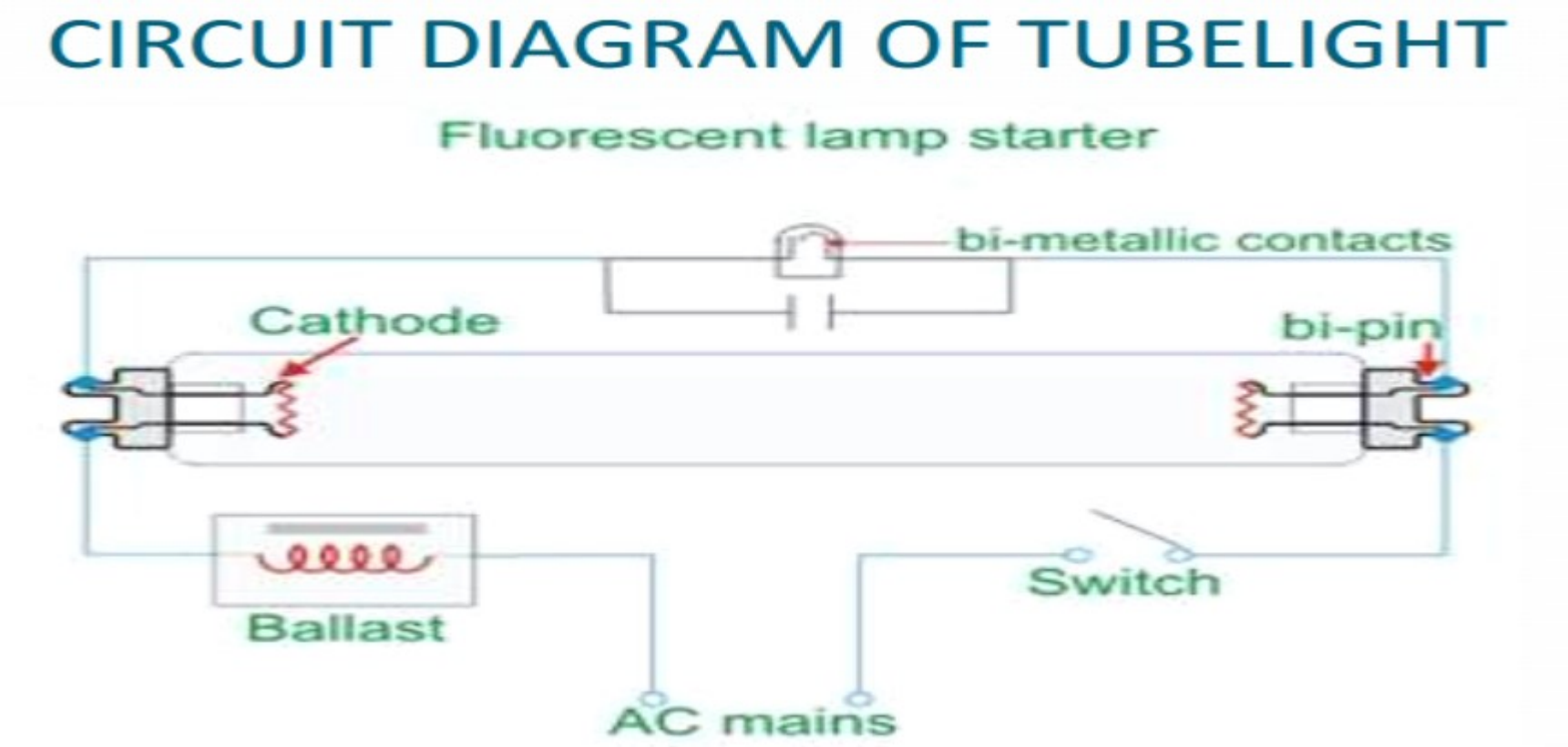
- *Mercury-inert gas mixture*
- *Phosphor Coating*
- *Electrode coils*
- *Mounting assemblies*
- *Aluminum cap*

Electromagnetic Ballast I Choke coil

Starter

- *Capacitor*
- *Glow bulb*

Tubelight


CIRCUIT DIAGRAM OF TUBELIGHT
Fluorescent lamp starter
bi-metallic contacts
Cathode
bi-pin
Ballast
Switch
AC mains

Working Principle of Tubelight

- ***When we switch on the supply voltage comes across the lamp as well as across starter.***
- ***At the full voltage first the glow discharge is established in the starter because the electrodes gap in glow bulb of starter is much lesser than that of fluorescent lamp.***

Working Principle of Tubelight

- ***Then gas inside the starter gets ionized due to this voltage and heats the bimetallic strip.***
- ***That causes to bend the bimetallic strip.***
- ***Due to it current starts flowing in the glow bulb ; and fluorescent tube gets short circuited.***
- ***As a result ionization of gas stops, so temperature decreases.***
- **So *bimetallic strip cools down; as a result contact breaks.***
- ***As explained earlier, at that instant, a large voltage surge comes across the inductor and gets added with supply voltage.***

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Chapter- 03

Modern Electric Lamps

Sodium Vapour Lamp

- gas-discharge lamp that uses sodium in an excited state to produce light
- Efficency is 75 lumens/watt
- Average life 60000 hours

Sodium Vapour Lamp

A sodium-vapour lamp is a gas-discharge lamp that uses sodium in an excited state to produce light. There are two varieties of such lamps: *low pressure and high pressure. Low pressure* sodium lamps are the most efficient electrical light sources, but their yellow light restricts applications to outdoor lighting such as street lamps. High-pressure sodium lamps have a broader spectrum of light than the low pressure, but still poorer colour rendering than other types of lamps. Low pressure sodium lamps only give monochromatic yellow light and so inhibit colour vision at night.

Mercury Vapour Lamp

A mercury vapour lamp is a gas discharge lamp that uses an electric arc through vaporized mercury to produce light. The arc discharge is generally confined to a small fused quartz arc tube mounted within a larger borosilicate glass bulb. The outer bulb may be clear or coated with a phosphor; in either case, the outer bulb provides thermal insulation, protection from the ultraviolet radiation the light produces, and a convenient mounting for the fused quartz arc tube.

LED Lamp

An LED lamp is a light-emitting diode (LED) product that is assembled into a lamp (or light bulb) for use in lighting fixtures. LED lamps have a lifespan and electrical efficiency that is several times better than incandescent lamps, and significantly better than most fluorescent lamps, with some chips able to emit more than 100 lumens per watt.

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Chapter- 04

Controlling and Protective Devices

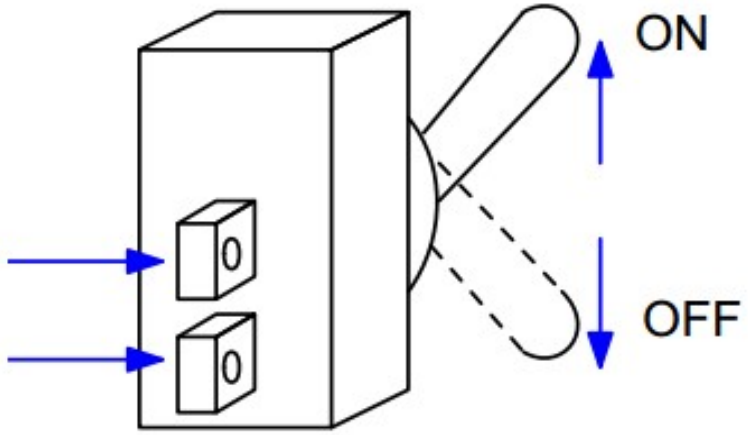
Types of Switches

- SPST
- SPDT
- DPST
- DPDT
- TPST

SPST(Single Pole Single Through)

A Single Pole Single Throw toggle switch connects or disconnects one terminal either to or from another. It is the simplest switch.

SPST(Single Pole Single Through)



SPDT(Single Pole Double Through)

A Single Pole Double Throw toggle switch connects a common terminal to one or the other of two terminals. It is always connected to one or the other. The two outside terminals are never connected by the switch.

DPDT(Double Pole Double Through)

DPDT

A Double Pole Double Throw toggle switch acts exactly like two separate SPDT switches connected to the same switch bat. It has two separate common terminals and each of those is connected to one or the other of the other two terminals on the same side of the switch. The dotted line in the picture is to illustrate that the switch is actually two SPDT switches in one package with one switch bat.

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Chapter- 05

Earthing

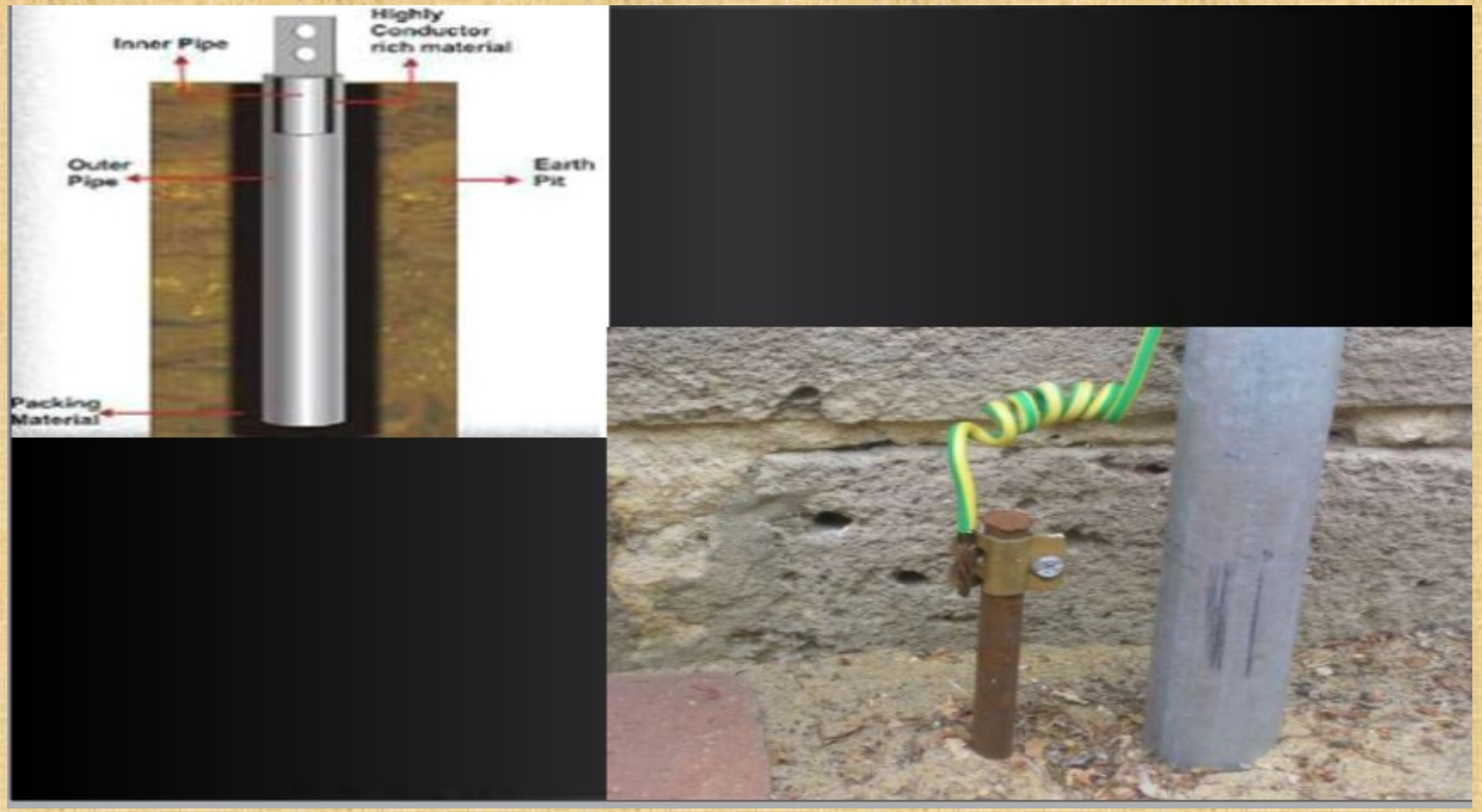
What is Earthing?

- **Earthing is used to protect us from an electrical shock.**
- **It does this by providing a path for a fault current to flow to earth.**
- **It also cause the protective devices to switch off the electric current to the circuit that has the fault by help of fuse.**

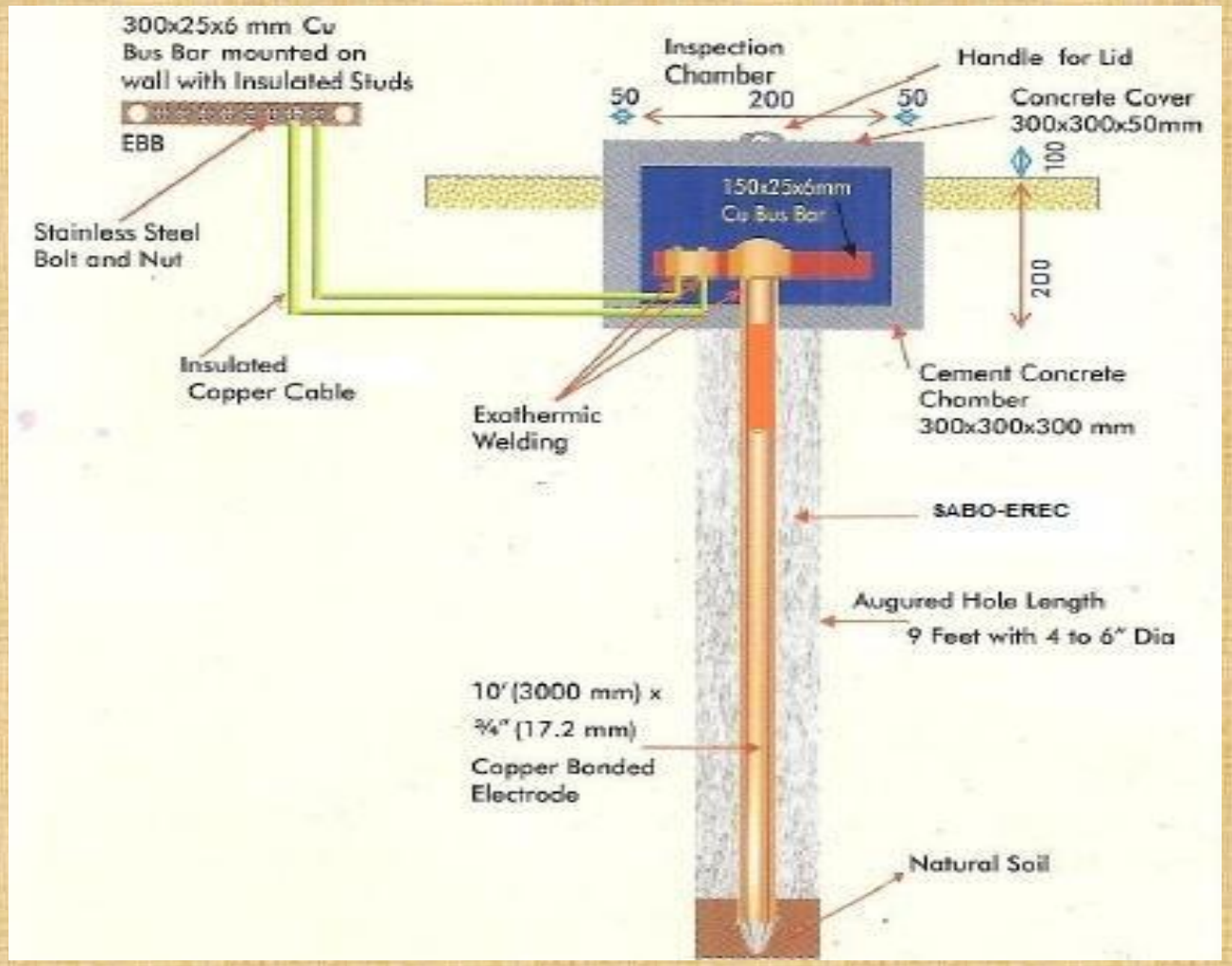
Types of Earthing

1) Plate Earthing
2) Pipe Earthing
3) Rod Earthing
4) Sheet Earthing

Pipe Earthing



Rod Earthing



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Chapter- 06

Phenomenon of Induced EMF

Dynamically Induced Emf

the figure, a conductor lying vertically in a uniform horizontal magnetic field of strength H. If I is the length of the conductor tying within this magnetic field and i is the current through 1t, then the force experienced by the conductor will be

F = B.i.l Newton

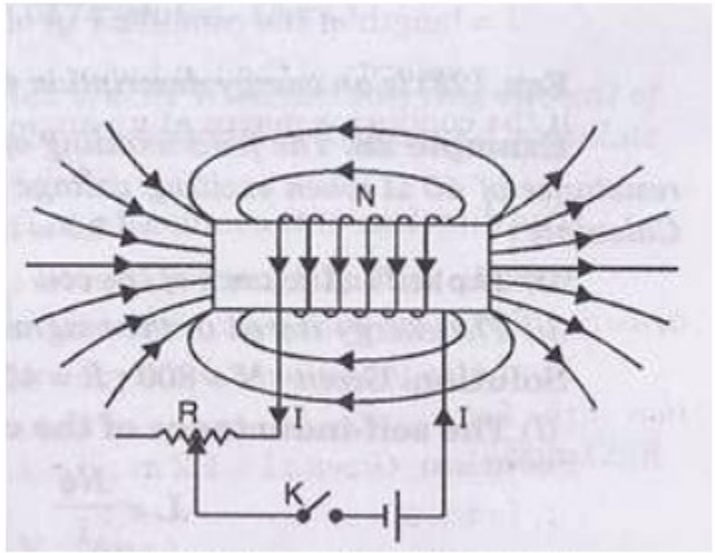
= μo.μr.H.i.l Newton

Contd.

The direction of the force F can also be determined by Fleming's Left Hand Rule. As per this rule, if any one holds out h:is or her hand with fore finger, second finger and thumb at right angle to each other, then his or her fore-finger will indicate the direction of magnetic field, the second finger will indicate the direction of flow of current and the thumb will give the direction of force or motion of the conductor. In this case the force experienced by the conductor will be

$F = B.i.l.\sin(\theta)$ Newton.

Self Inductance



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