



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME : 19EE101 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

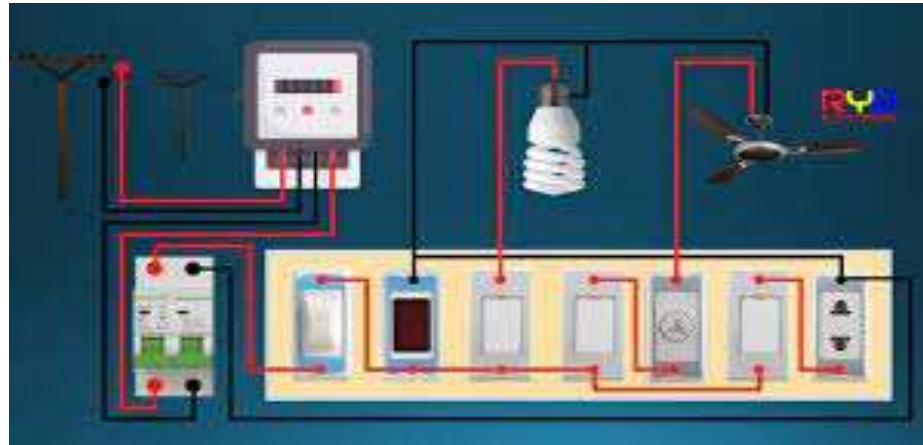
I YEAR /II SEMESTER-MECHANICAL & MECHATRONICS ENGINEERING

Unit 3- Wiring, grounding and safety



WIRING

- Electrical Wiring is a process of connecting cables and wires to the related devices such as fuse, switches, sockets, lights, fans etc to the main distribution board is a specific structure for continues power supply





WIRING MATERIALS & ACCESSORIES

SWITCH:

A switch is used to make or break the electric circuit.

Types of switches:

- Surface switch or Tumbler switch
- Flush switch
- Pull switches or ceiling switches
- Rotary Snap switch
- Push button switch
- Iron –clad Water Tight Switches



Surface or Tumbler switch

Mounted on the mounting block directly connected to the surface of the wall. It is projected out of the surface of the wall.

- Single-way switch
- Two-way switch





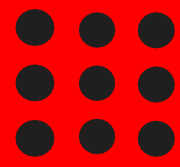
Pull switches or Ceiling switches

- The Pull switches are fixed on the ceiling and all live parts are out of reach of the operator
- The switch has strong mechanical action. It is operated with a single pull.





Rotary Snap switches





Push button switch

- This type of switch consists of one blade only.
- The blade is given a rocking action by press button and movement is controlled by a cam and spring.





Lamp Holder

- Used to hold the lamp for lighting purpose

Pendent Holder





- Batten holder

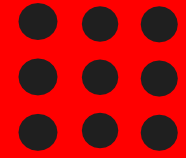




Screw lamp holder

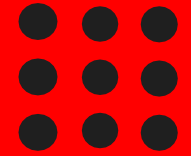


Fluorescent lamp holders



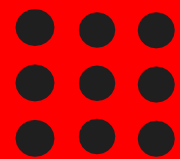


Starter holder



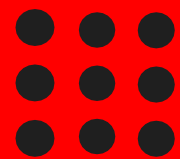
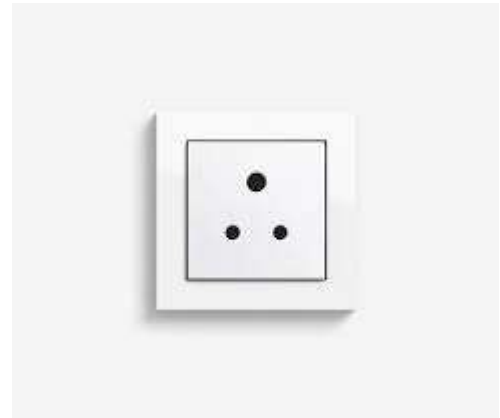


Ceiling roses



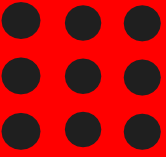


Socket outlets





Distribution fuse boards





General rules for wiring

- The conductor used is to be of such a size that it may carry load current safely
- The conductors installed are to be safe in all respects.
- Every sub-circuit is to be connected to a distribution fuse board.
- Every line (phase or positive) is to be protected by a fuse of suitable rating as per requirements.
- A switch board is to be installed so that its bottom lies 1-25 metres above the floor.
- All plugs and socket-outlets are to be of 3-pin type, the appropriate pin of socket being connected permanently to the earthing system.



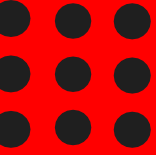
General rules for wiring

- Adequate number of socket-outlets is to be provided at suitable places in all rooms so as to avoid use of long lengths of flexible cords.
- Socket-outlets are not to be located centrally behind the appliances with which these are used. Socket-outlets are to be installed either 25 cm or 1.30 metres above the floor level as desired.
- No socket-outlet is to be provided the bath room at a height less than 1.30 metres.
- All incandescent lamps unless otherwise required, are to be hung at a height of 2.5 metres above the floor level.
- Unless otherwise specified, all ceiling fans are to be hung 2.75 metres above the floor.



General rules for wiring

- No fuse and switch is to be provided in earthed conductor.
- Every circuit or apparatus is to be provided with a separate means of isolation such as a switch
- In any building, light and fan wiring and power wiring are to be kept separate.

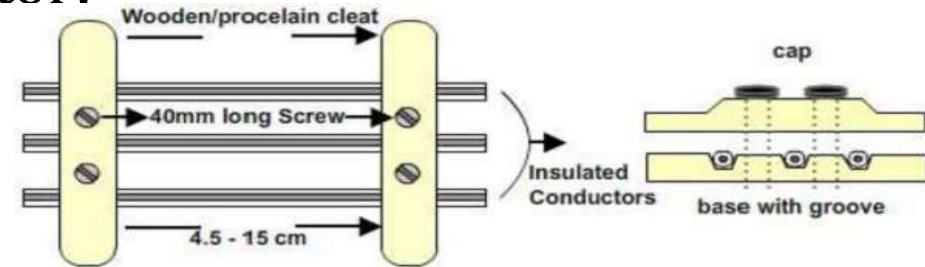


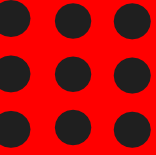


Types of wiring

Cleat wiring

Cleat wiring is one of the cheapest wiring systems considering the initial cost and labour and it is most suitable for a temporary electrical wiring. This wiring system is quickly installed, easily inspected and altered. In this type of wiring VIR(vulcanised Indian Rubber wire in porcelain cleats) or PVC insulated wire is used as a conductor.

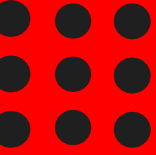




- **Advantages of Cleat Wiring:**

- It is simple and cheap wiring system
- Most suitable for temporary use i.e. under construction building or army camping
- As the cables and wires of cleat wiring system is in open air, Therefore fault in the cables can be seen and repair easily.
- Cleat wiring system installation is easy and simple.
- Customization can be easily done in this wiring system e.g. alteration and addition.
- Inspection is easy and simple





- **Disadvantages of Cleat Wiring:**

- Appearance is not so good.
- Cleat wiring can't be use for permanent use because, Sag may be occur after sometime of the usage.
- In this wiring system, the cables and wiring is in open air, therefore, oil, Steam, humidity, smoke, rain, chemical and acidic effect may damage the cables and wires.
- It is not lasting wire system because of the weather effect , risk of fire and wear & tear.
- it can be only used on 250/440 Volts on low temperature.
- There is always a risk of fire and electric shock.
- It can't be used in important and sensitive location and places.
- It is not lasting, reliable and sustainable wiring system.





Wooden Casing Capping

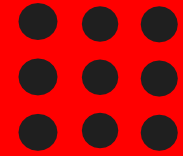
- The cables were carried through the wooden casing enclosures. The casing is made up of a strip of wood with parallel grooves cut length wise so as to accommodate VIR cables. The grooves were made to separate opposite polarity. the capping (also made of wood) used to cover the wires and cables installed and fitted in the casing.

Wooden Casing And Capping Wiring





- **Advantages of Casing Capping Wiring:**
- It is cheap wiring system as compared to sheathed and conduit wiring systems.
- It is strong and long-lasting wiring system.
- Customization can be easily done in this wiring system.
- If Phase and Neutral wire is installed in separate slots, then repairing is easy.
- Stay for long time in the field due to strong insulation of capping and casing..
- It stays safe from oil, Steam, smoke and rain.
- No risk of electric shock due to covered wires and cables in casing & capping.





- **Disadvantages Casing Capping Wiring:**
- There is a high risk of fire in casing & capping wiring system.
- Not suitable in the acidic, alkalies and humidity conditions
- Costly repairing and need more material.
- Material can't be found easily in the contemporary
- White ants may damage the casing & capping of wood.



REFERENCES

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THANK YOU