SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

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: 23EET101/BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

I YEAR / I SEMESTER

Unit III – WIRING, GROUNDING AND SAFETY

Topic : Wiring – General rules and Accessories

GENERAL RULES

1. Every installation is to be properly protected near the point of entry of supply cables by a two-pole linked main switch and a fuse unit. In a two-wire installation if one pole is permanently earthed, no fuse, switch or circuit breaker is to be inserted this pole. A 3-pole switch and fuse unit is to be used in 3-phase supply.

2. The conductor used is to be of such a size that it may carry load current safely.

3. The conductors installed are to be safe in all respects.

4. Every sub-circuit is to be connected to a distribution fuse board.

5. Every line (phase or positive) is to be protected by a fuse of suitable rating as per requirements.

6. A switch board is to be installed so that its bottom lies 1-25 metres above the floor.

GENERAL RULES

7. 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.

8. All incandescent lamps unless otherwise required, are to be hung at a height of 2.5 metres above the floor level.

9. Lights and fans may be wired on a common circuit. Each sub-circuit is not to have more than a total of ten points of lights, fans and socket outlets. The load on each sub-circuit is to be restricted to 800 watts.

10. No fuse and switch is to be provided in earthed conductor.

11. Every circuit or apparatus is to be provided with a separate means of isolation such as a switch.

12. All apparatus requiring attention are to be provided with means of access to it.

13. In any building, light and fan wiring and power wiring are to be kept separate.

GENERAL RULES

14. In 3-phase, 4-wire installation the load is to be distributed equally on all the phases.

15. No additional load is to be connected to an existing installation unless it ahs been ascertained that the installation can safely carry the additional load and that the earthling arrangements are adequate.

16. Lamp holders used in bath rooms are to be constructed or shrouded in insulating materials and fitted with protective shield and earth continuity conductor is not to be of size less than 7/0.915 mm.

17. The metal sheaths or conduits for all wiring and metal coverings of all consuming apparatus or appliances is to be properly earthed in order to avoid danger from electrical shock due to leakage or failure of insulation.

GENERAL RULES

18. Each sub-circuit is to be protected against excessive current (that may occur either due to overload or due to failure of insulation) by fuse or automatic circuit breaker.

19. All live conductors are to be insulated or otherwise safe guarded to avoid danger.

20. After completion of work the installation is to be tested before energisation

WIRING ACCESSORIES AND MATERIALS

- All the wiring systems and electrical installations needs the following accessories:

- Cables
- Flexible wires
- Switches
- Fuses
- Ceiling rose
- Lamp holders
- Plugs
- Socket outlets
- Junction boxes

CABLES

- A cable is made of some conducting material such as copper or aluminum. It is surrounded by insulation and a sheath for mechanical protection.
- The cables are generally classified according to the insulation used. Different types of cables are as follows:

➢ Weather- proof cables

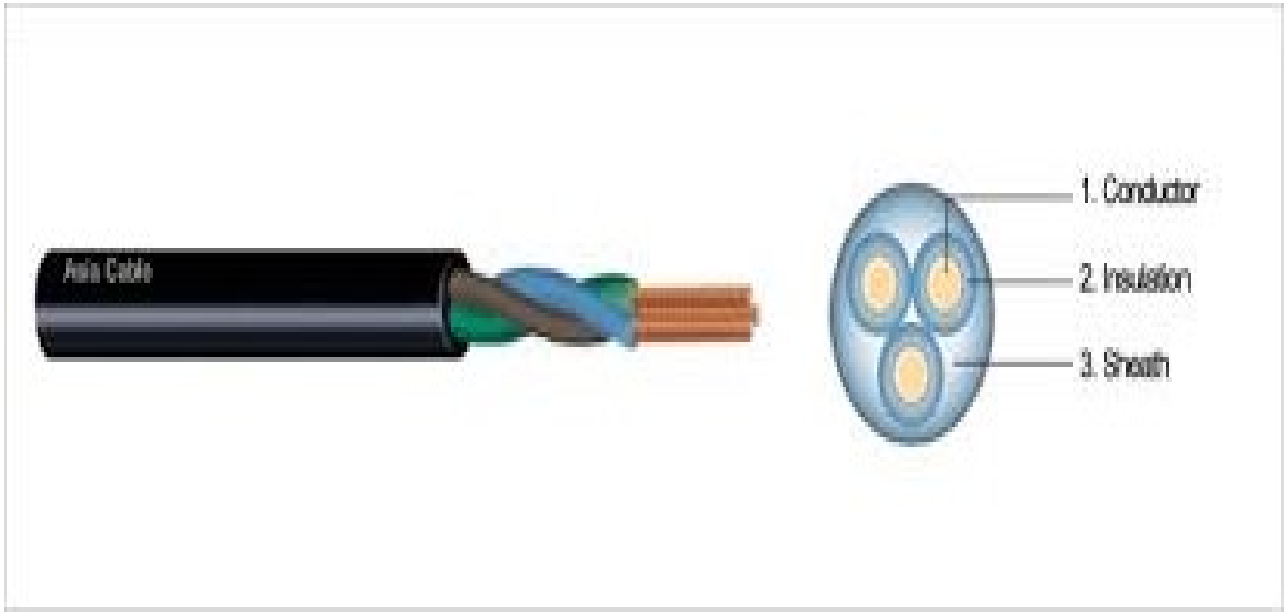
➢ Polyvinyl chloride insulated cables (PVC)

➢ Lead sheathed cables

➢ Cab tyre sheathed cables (CTS)

FLEXIBLE CORD

- In the flexible cord, a large number of fine wires are used to form the conductor. These are insulated by plastic insulation.
- The flexible cords are used as connecting wires to connect the portable domestic appliances and light fittings etc.
- These cords are easy to guide and handle.



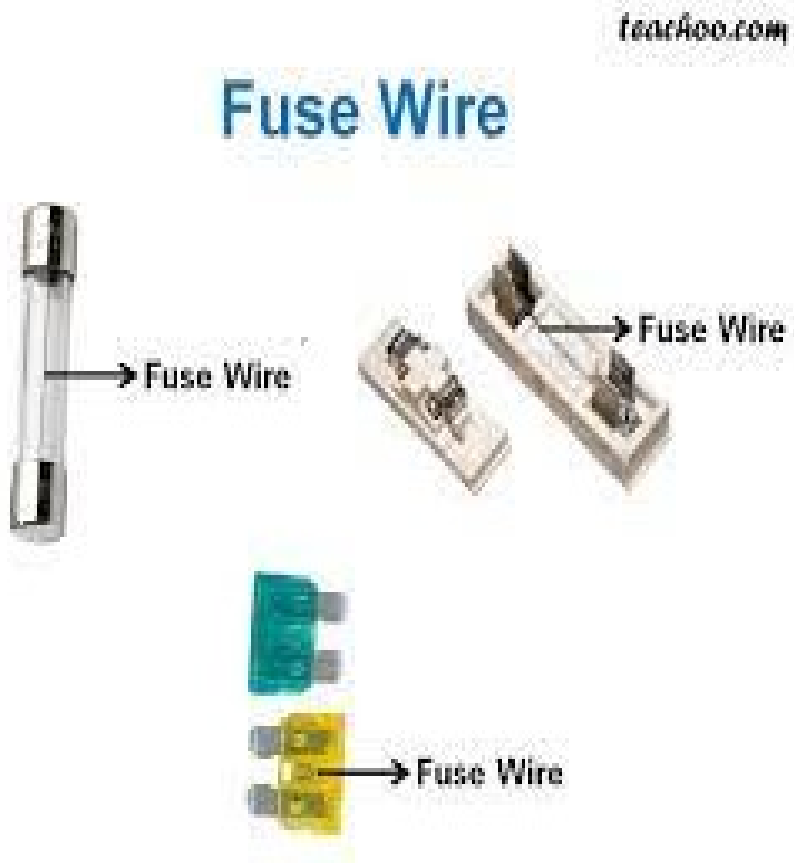
SWITCHES

- A switch is supposed to carry out the make (connect) and break (disconnect) of electrical connection to the load.
- Switches should be connected to the live (L) wire in the circuit.
- The switches can be classified into two types as follows:

1. Tumbler switch
2. Flush switch

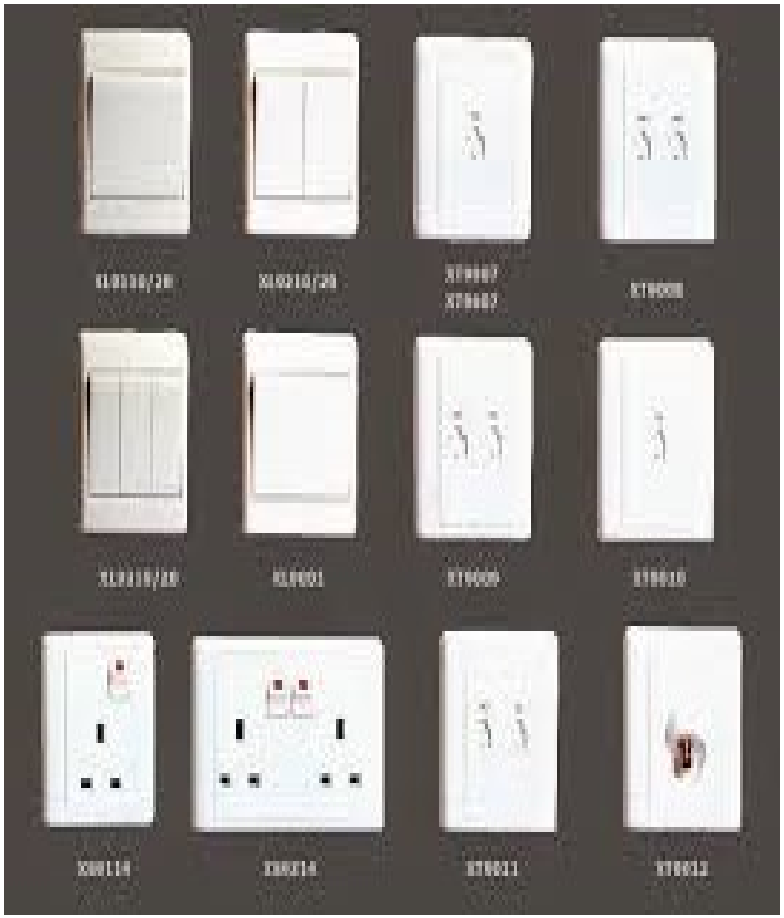
FUSES

- In any electrical installation, fuse is used for protecting the appliances against over current. Fuse is used in different stages of the wiring.
- A fuse can be made of the following conducting materials:
  - Copper
  - Zinc
  - Lead
  - Tin
  - Aluminium
  - Alloys of lead and



SOCKET OUTLETS

- The socket outlets are provided for temporary electrical connections such as table lamps, table fans, radio, TV, mobile chargers etc.
- The socket outlet can be of the following two types:
  - ➢ Two pin type (Live, Neutral)
  - ➢ Three pin type (Live, Neutral, Earth)



PLUGS

- The plugs along with flexible cords are used for providing the electrical supply to the portable appliances like table fan, table lamps, radio etc.
- The plugs are available in two types, similar to the sockets:

1. Two pin plugs
2. Three pin plugs

LAMP HOLDER

- A lamp holder supports the lamp and connects it to the supply system as well
- The lamp holders are classified into following different types:

1. Batten holders
2. Angle holder
3. Pendant holder
4. Water tight bracket holders
5. Bracket holders

CEILING ROSE

- The ceiling rose is used for connecting the ceiling fans, pendant lamps etc to the supply system.
- Ceiling rose is made of the following two parts:

1. Base
2. Cover

THANK YOU