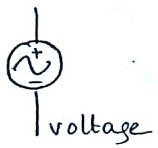
UNIT - I

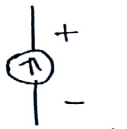
ELECTRICAL SYMBOLS.

i) AC Supply (or) AC Source



ii) DC Supply (or) DC Source

Voltage Source



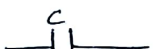
Current Source

iii) Resistor

Fixed

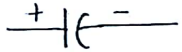
Variable.

iv) Capacitor



Fixed

Variable



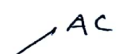
Electrolytic

v) Rheostat (or) Potentiometer

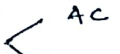
vi) Motor

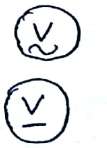
vii) Generator

viii) Instrument — Ammeter



ix) " — Voltmeter



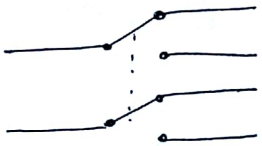


x) Switches

SPST

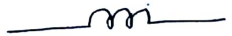
SPDT

DPDT

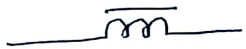


DPST

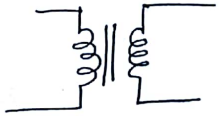
xi) Inductor or winding



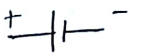
» with core



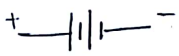
xii) Transformer



(xiii) Cell



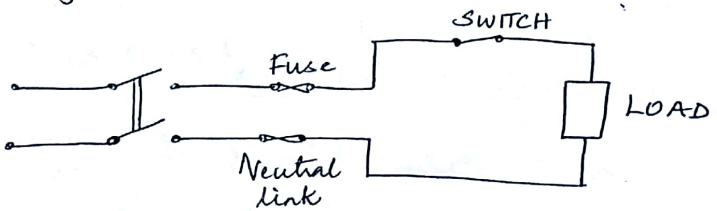
battery



Earth(ground)

Fuse

Definition : Fuse is a short piece of metal wire, inserted in series with the circuit, which melts when predetermined value of current flows through it and breaks the circuit.



A Fuse is connected in series with the circuit to be protected and carries the load current without overheating itself under normal conditions. However, when Abnormal condition occurs, an excessive current flows through it. This raises the temperature of the fuse wire to the extent that it melts and opens the circuit. This protects the machines or apparatus from damage that can be caused by the excessive current.

Characteristics of fuse :

Inverse time current characteristics. Larger the current, smaller is the time taken by the fuse to bl

Advantages of fuse:

1) Cost of Fuse is Low.
2) It Requires no maintenance.
3) It interrupts heavy current without noise or Smoke.

Disadvantages of Fuse:

1) More time it takes for rewiring (or) replacing fuse after each operation

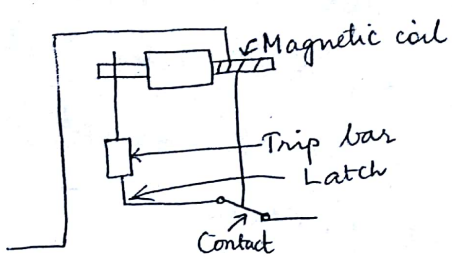
Types of Fuse

- Low Voltage Fuses
- High Voltage "

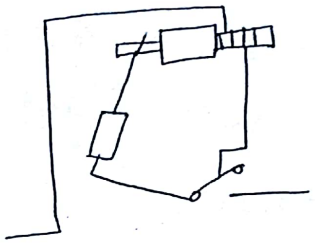
Other types

1) Catridge Fuse
2) Blade type Fuses
3) SMD fuses
4) Axial fuses
5) HRC (High rupturing capacity) fuse

Miniature circuit Breaker (MCB)



Closed condition



Open condition

Miniature circuit Breaker is a protective device which automatically operates to protect equipment against over current and short circuit faults.

CONSTRUCTION:

The main parts of MCB are explained below:-

i) outer body or housing : The outerbody of MCB is moulded from a special grade fibre-reinforced polyester with the help of an injection-moulding machine. The outerbody is fire-retardant, anti-tracking, they can withstand high-temperature and mechanical impacts.

ii) Contacts: The contacts of an MCB are made of pure silver. This provides definite advantages such as long contact life, low contact resistance, ensures quick arc removal and low heat generation.

iii) Operating Mechanism: All the components of the operating mechanism are made of special plastic that they are self lubricating that Eliminates wear and tear, rust and corrosion

iv) Arc extinguishing chamber: The Arc produced during breaking of circuit is extinguished abruptly by providing a special arc chute chamber.

Working: MCB may operate under the following two different conditions:-

i) Moderate overload condition

When there is moderate overload conditio the thermostat deflects in response to curren passing through it, thereby releasing the trip mechanism

ii) Short circuit conditions: When the current flowing through the MCB reaches a predetermin level, it pushes the solenoid plunger that releases the trip mechanism and simultaneously separates the contacts.

Applications: MCB is used to protect sophistica equipments like computer, A/C, compressors, refrige etc..

Power Rating of Basic Equipment

Ceiling fan	25W - 75W
Desktop	50W - 150W
Home A/C	1000W - 4000W
Laptop	50W - 100W
Inkjet printer	20W - 30W
TV (19")	70W - 100W
Washing m/c	500W - 500W
Table fan	10W - 25W
Iron Box	1000W - 1000W
60W bulb	60W
Microwave	600W - 1500W

Neutral and Earth connection

Neutral : * It provides the return path of the current * It carries unbalanced current of the system.

* Size of Neutral is half (or equal) to line or phase wire.
* All measuring and protective instrume are connected between line & Neutra

Earth connection.

The earth wire or earth connection provides an easy path for the leakage current and protects the human beings from Electric shock.

Earthing

The process of connecting metallic bodies of all the electrical apparatus and equipment to the huge mass of earth by a wire of negligible resistance is called earthing.