ACTIVITY- 4 (Identification of Components)

AIM:

To identify a diode, a LED, a transistor, an IC, a resistor and a capacitor from a mixed collection of such items.

APPARATUS:

Multimeter, a collection of diode, LED, transistor, IC, resistor and capacitor.

PRINCIPLE:

- A diode is a two terminal device. It conducts when forward biased and does not conduct when reverse biased. It does not emit light while conducting.
- A LED (light emitting diode) is also a two terminal device. It conducts when forward biased and does not conduct when reverse biased. It emits light while conducting.
- A transistor is a three terminal device. The terminals represent emitter (E), base (B) and collector (C).
- An IC (integrated circuit) is a multi-terminal device in the form of a chip. But some may have only three terminals, e.g. 7805, 7806, 7809, 7912.
- A resistor is a two terminal device. It conducts equally in both directions.
- A capacitor is a two terminal device. It does not conduct but stores some charge when dc voltage is applied.

PROCEDURE:

1. Check the physical appearance of the component.If it has four or more terminals and has the appearance of a chip (black rectangular block), then it is an IC.
2. If it has three terminals, the component may be a transistor.
3. If the component has two terminals, it could be a resistor, a capacitor, a diode or a LED.

4. Look for color bands, if it has a typical set of three color bands followed by a silver or gold band, the component is a resistor.
5. Connect the multimeter terminals (in resistance mode highest range) to the component terminals and watch for multimeter deflection. Also repeat by reversing the component terminals.
6. If the multimeter shows an equal deflection in both the directions, the component is a resistor.
7. If the deflection is accompanied with emission of light, in one direction and a much less or zero deflection in the other direction the component is a LED.
8. If the multimeter does not show any deflection in one direction and shows deflection with no light emission in the other direction then, the component is a diode.
9. If the multimeter does not show any deflection on connecting its terminals either way to the component, it is a capacitor. But if the capacitance of the capacitor is large, the multimeter may show a momentary deflection.

RESULT:

A diode, a LED, a transistor, an IC, a resistor and a capacitor are identified respectively from a mixed collection

PRECAUTIONS:

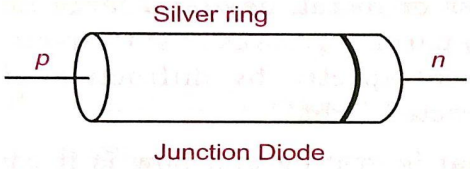
1. While obtaining resistance of any component, clean its leads properly.
2. Students must handle the multimeter carefully.

SOURCES OF ERROR:

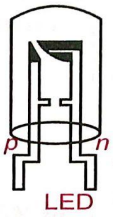
1. When the metal ends of a multimeter lead are touched, the multimeter should show zero resistance. If it does not show it, bring the pointer to zero using 'Zero Adj knob' on the multimeter. If it is not done, the resistance measurements are not reliable.

2. While checking resistance of a component, avoid touching either of the metal ends of the multimeter leads. Body resistance in parallel with component resistance can affect the resistance measurement.

DIAGRAMS



(*i*)



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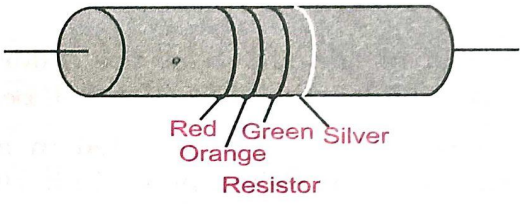

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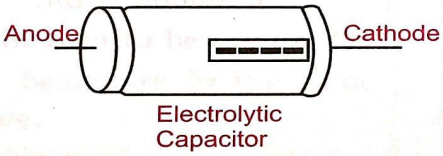

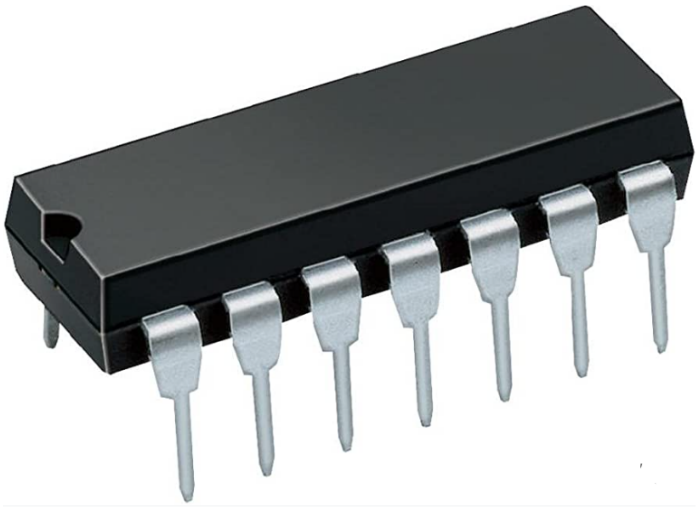

IC

TABLE FOR IDENTIFICATION OF COMPONENTS WITH THE HELP OF TERMINALS

Sl.No	Number of terminals	Device
1	Two	Diode,LED,Resistor,Capacitor
2	Three	Transistor
3	More than Three	IC

TABLE FOR IDENTIFICATION OF COMPONENTS WITH THE HELP OF CURRENT FLOW

Sl.No	Flow	Device
1	Unidirectional with no light emission	Diode
2	Unidirectional with light emission	LED
3	Current in both direction	Resistor
4	No flow of direct current in any way	Capacitor