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Name of the laboratory with code :

Basic Electronics laboratory EC551

Date of the experiment : 25-11-2022

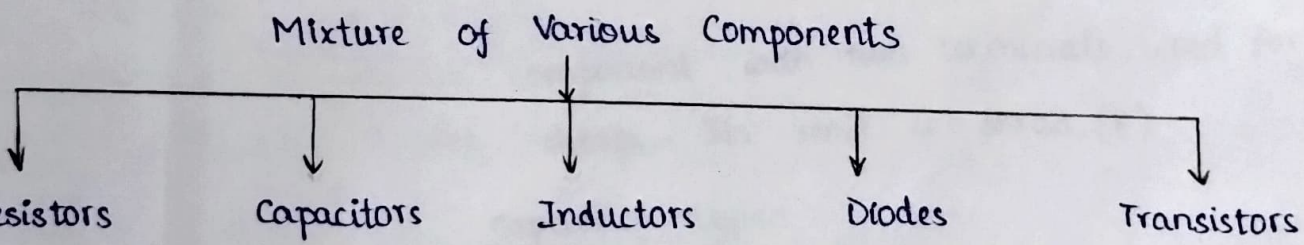
Experiment Number : 2

Roll Number : 22D80013

Group Number : 4

Name of the experiment : To identify and understand names and related terms of various electronic components used in electronic circuits.

Electronic components : To observe various electronic components physically and identify each component name from various components



Characteristics of electronic components:

Identify different terminals of components, find their values and observe numbering associated with it.

Characteristics of electronic components

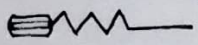
- Terminals (One, two, ...)
- Value (Ohm, Farad, Henry, ...)
- Rating (Numerical value)
- Specification

Resistor :

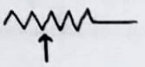
It is the most common component with two terminals used in the circuit to limit the amount of current through it. Its units is Ohm (Ω)

Resistor types

- Fixed (Non-variable)
  - Value can be found from colour code or directly written on it



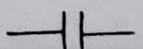
- Variable



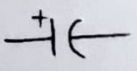
Capacitor : It is passive component with two terminals used for holding or storing electric charge. Its unit is farad (F).

capacitor types

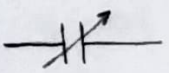
- Non-variable
  - Non electrolytic (NO polarity)



  - Electrolytic



- Variable



Inductor: It is passive component used to provide opposition to the change in flow of current in a circuit. The unit of inductor is Henry (H).

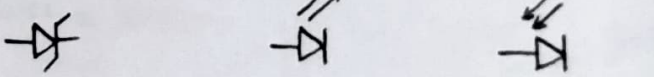
Inductor types

- Aircore
- Iron core
- Transformer: Two coils placed in closed proximity

Diode: Two terminal active component, which allows current to flow only in one direction.

Diode

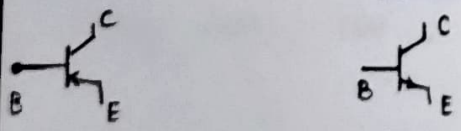
- Ordinary semiconductor: cathode with silver ring
- special
  - Zener
  - LED
  - Photodiode



Transistor: It is a three terminal active component used for amplification of weak ac signals or for switching dc voltages

Transistor

- PNP
- NPN
- special
  - Phototransistor

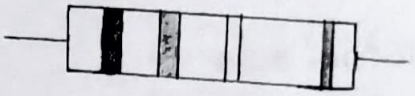


Resistors :

→ Placed in series with light-emitting diode (LED) to limit current passing through LED.

→ Resistors have 4 coloured bands with colour codes

- First band gives first digit
- Second band gives second digit
- Third band gives number of zeros
- Fourth band shows tolerance (precision)



The resistor colour code										
Number	0	1	2	3	4	5	6	7	8	9
colour	Black	Brown	Red	orange	Yellow	Green	Blue	Violet	Grey	white

Special colour code for fourth band tolerance :

Brown ± 1%
Red ± 2%
No colour ± 20%
Gold ± 5%
Silver ± 10%

Eg: Brown, Black, Blue, Gold represent $10 \times 10^6 \pm 5\%$

→ Based on size of resistors power consumed by resior also changes as

Big has 1W, Medium has $\frac{1}{2}$W, Small has $\frac{1}{4}$W.

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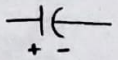
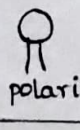
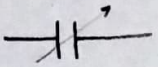
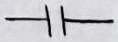
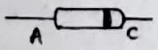
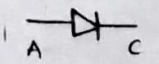
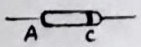
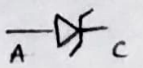
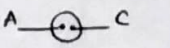
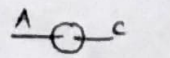
Observations of different resistors :

S.NO	Colour Bands on Resistors	R using Colour band (Ω)	R using Multimeter (Ω)
1.	Brown, Black, Blue, Gold	$10 \times 10^6 \pm 5\%$ Ω	10.02×10^6 Ω
2.	Green, Blue, Brown, Gold	$56 \times 10^1 \pm 5\%$ Ω	0.574×10^3 Ω
3.	Brown, Black, Orange, Gold	$10 \times 10^3 \pm 5\%$ Ω	9.65×10^3 Ω
4.	Yellow, Violet, Yellow, Gold	$47 \times 10^4 \pm 5\%$ Ω	0.48×10^6 Ω
5.	Red, Red, Red, Gold	$22 \times 10^2 \pm 5\%$ Ω	2.15×10^3 Ω

For capacitors :

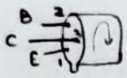
S.NO	Name of capacitor	Pictorial view	Symbol	Rated values
1.	Electrolytical / Cylindrical			1 μF, 63 V (breakdown)
2.	Ceramic / Spherical			103 $\Rightarrow$ $10 \cdot 10^3$ pF = 0.01 μF
3.	Tantalun capacitor			104 $\Rightarrow$ 10×10^4 pF

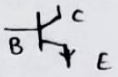
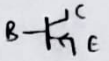
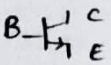
S.NO	Instrument	Pictorial view	Symbol	Rated values
1.	Diode			1N4007, V_F = 0.6 V Grey ring - cathode (-ve)
2.	Zener Diode			C4V7 $\Rightarrow$ 4.7 V (breakdown) 0.42 V
3.	Green LED			1.8537 V
4.	Red LED			1.6480 V

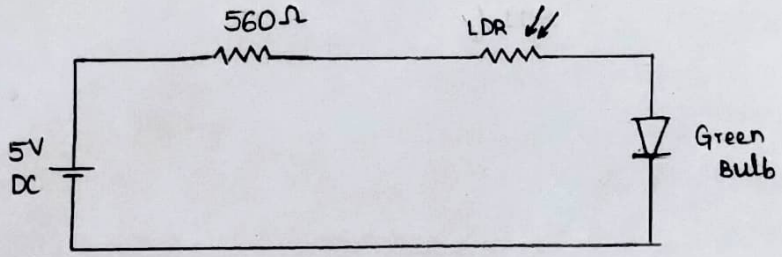
Date .....

Signature .....

Transistors : It has 3 terminals, Emmiter, Base and collector



S.No	Type of Transistor	Voltage	Type	Symbol
1.	CL100	+ 0.649 V	npn	
2.	CK100	0.635 V	pnp	
3.	BC109	0.646 V	npn	



Circuit

Conclusion :

After connecting the circuit as shown above we can see that bulb glows with different intensity as the light on the LDR varies.

Date .....

Signature .....