195E02IT058

Date
Page

PRACTICAL - 1

* Study the basics of electronics for IOT.

1) Voltage (V)
2) Current (I)
3) Resistance
4) Power (P)
5) AC / DC current
6) Register
7) Breadboard
8) Jumper wire
9) LED
10) Development Board

⟹

① Voltage (V)

→ Voltage is the pressure from an electronic circuit's power source that pushes charged electrons through a conducting loop, enabling them to do work such as illuminating a light.

→ It is messured in volts (V).

$$V = IR$$

where,

V = voltage

I = current

R = Resistance

② Current (C)

→ A current is a flow of electric charge.

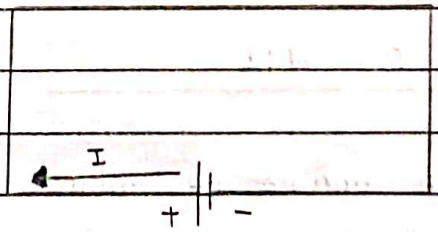
→ Current is measured in Amperes (A).

→ More voltage → More current

→ Current, I is the rate at which electric charges move through a given area.

- It would be like standing in front of Burger King and count all the cars travelling down Henry street over a given time period.

→ For our purpose, we will consider the travelling of positive charges from positive fields to negative fields.



③ Resistance

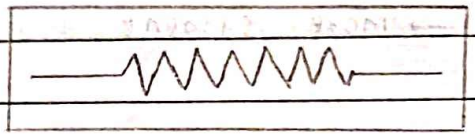
→ The Resistance of a conductor is the ratio of voltage across the conductor to the current flowing through the conductor.

- Resister can be thought of as a conducting material that alters the flow of charge carries through the circuit.

→ Resistor can be light bulbs, appliances, a new material

→ SI unit is called an ohm (Ω).

symbol :-



(4) POWER

- We can define power as the rate of doing work, it is the work done in unit time. The SI unit of power is Watt (W) which is joules per second (J/s).

power = work / time
P = W / t

- Sometimes the power of motor vehicals and other machines is given in terms of Horsepower (hp), which is approximately equal to 745.7 watts.

(5) Ac / DC current

- Alternating current describe the flow of charge that changes direction periodically. As a result, the voltage level also reverses along with the current.
- Ac is used to deliver power to houses, office buildings, etc.

- Direct current is a bit easier to understand than alternating current. Rather than oscillating back and forth, DC provides a constant voltage or current.

Application of DC:-

- Cell phones
- Flashlights
- Flat-screen TVs
- Electric vehicals

⑥ Register

- Registers are type of computer memory used to quickly accept, store and transfer data and instructions that are being used immediately by the CPU.

- List of common register:-

Register	symbol	Number of bits
Data register	DR	16
Address register	AR	12
Accumulator	AC	16
Instruction Register	IR	16

⑦ Breadboard:-

- The Breadboard is the bread-and-butter of DIY electronics. Breadboards allow beginners to get acquainted with circuit without the need for soldering, and even seasoned tinkerers use breadboards as starting points for large-scale projects.

- Breadboards is used to build and test circuits quickly before finalizing any circuit design.
- Breadboards has many holes into which circuit components like ICs and resistors can be inserted.

⑧ Jumper Wire:-

- A Jumper wire is an electric wire that connects remote electric circuit used for printed circuit boards.

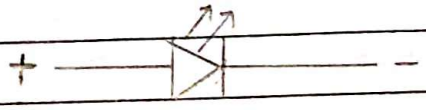
- Use:-

Attach one red jumper cable clamp to the positive terminal on the dead battery. Attach the other end of the same cable, the second red jumper cable clamp, to the positive terminal on the working car battery. Attach one black jumper cable clamp to the negative terminal of the working car's battery.

9) LED :-

- Light Emitting Diode (LED) is a speciw type of PN junction diode. The light emitting diode is specially doped and made of a special type of semiconductor.

- This diode can emit light when it is in the forward biased state.



- Alyminium indium gallium phosphide (AlInGaP) and indium gallium nitride (InGaN) are two of the most commonly used semiconductors for LED technologies.

10) Development Board :-

- Development Boards are printed circuit board with a microcontroller / microprocessor mounted on them with few other hardware components.

- Development boards are meant for system Designers to become acquainted with programming a processor onboard and also to develop and test projects effectively and efficiently.

- Advantage :-

- You don't need to worry about sitting and finding