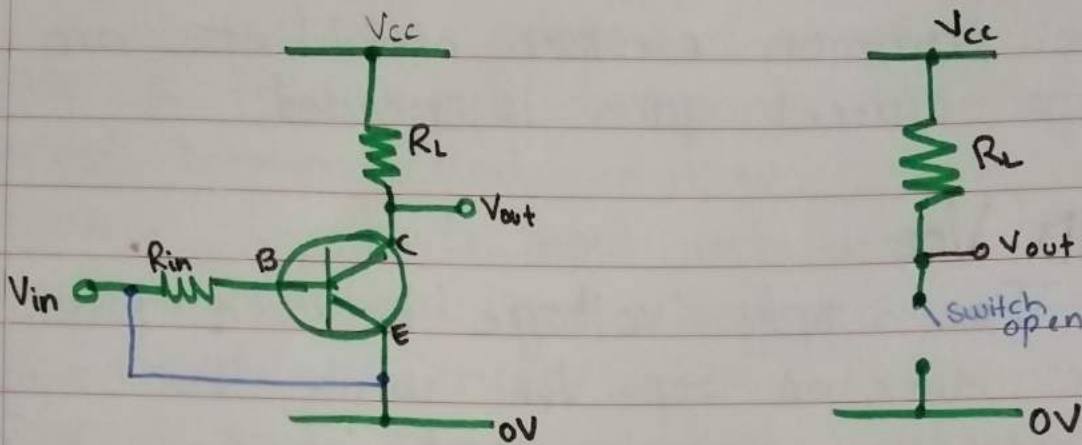


# TRANSISTOR AS A SWITCH



Transistor switches are ideal for switching low voltage devices ON or OFF by using the transistor in its saturated or cut-off state.

Solid state switches are one of the main applications for the use of transistor to switch a DC output "ON" or "OFF".

High power devices such as motors, solenoids or lamps, often require more power than that supplied by an ordinary logic gate so transistor switches are used.

The areas of operation for a transistor switch are known as the Saturation region and the cut-off Region.

Fully Off  $\rightarrow$  Cut-off

Fully On  $\rightarrow$  Saturation

## \* CUT-OFF REGION

Here the operating conditions of the transistor are zero input base current ( $I_B$ ), zero output collector current ( $I_C$ ) and maximum collector voltage ( $V_{CE}$ ) which results in a large depletion layer and no current flowing through the device. Therefore the transistor is switched "Fully Off"

## \* SATURATION REGION

Here the transistor will be biased so that the maximum amount of base current is applied, resulting in maximum collector current ( $I_C$ ) resulting in the minimum collector emitter voltage drop which results in the depletion layer being as small as possible and maximum current flowing through the transistor. Therefore the transistor is switched "Fully On".