

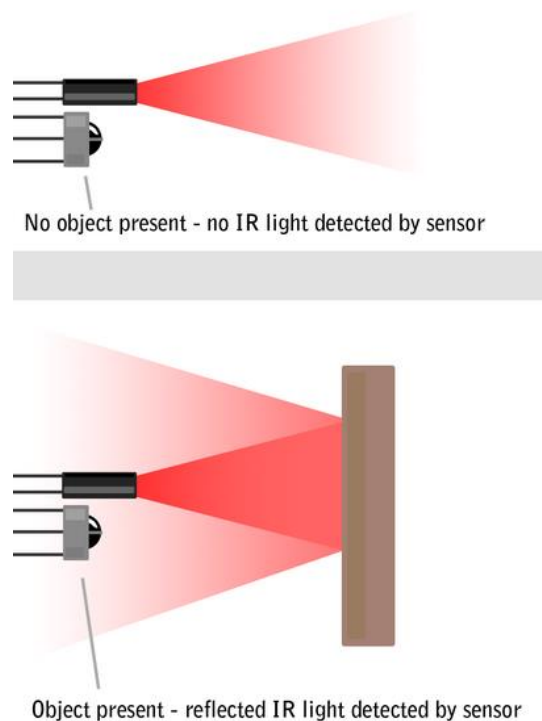
Technocrats Robotics electrical recruitment		
<u>Name:</u>		
<u>Roll No:</u>		
<u>Contact No:</u>		
<u>Whatsapp No:</u>		
<u>Time Taken:</u>	<u>/45 Mins</u>	<u>(5 Questions)</u>

Q1-2

Based Upon the working principle given below answer the Question 1 and 2

Principles of Operation

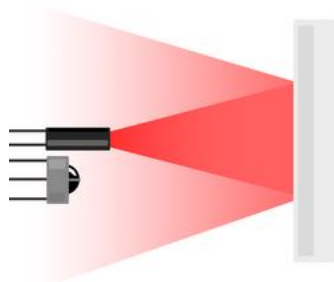
We have already discussed how a light sensor works. IR Sensors work by using a specific light sensor to detect a select light wavelength in the Infra-Red (IR) spectrum. By using an LED which produces light at the same wavelength as what the sensor is looking for, you can look at the intensity of the received light. When an object is close to the sensor, the light from the LED bounces off the object and into the light sensor. This results in a large jump in the intensity, which we already know can be detected using a threshold.



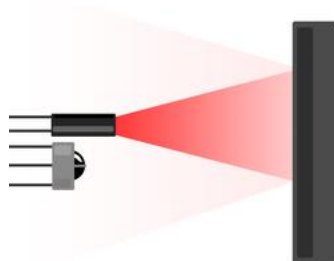
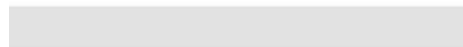
*Depiction of the operation
of an IR Sensor*

Detecting Brightness

Since the sensor works by looking for reflected light, it is possible to have a sensor that can return the value of the reflected light. This type of sensor can then be used to measure how "bright" the object is. This is useful for tasks like line tracking.



Lightly colored objects reflect more IR light



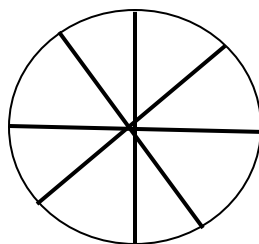
Darker colored object reflect less IR light

*Depiction of the operation of an
IR Sensor to measure brightness*

Q1. An encoder is a device which is used to measure the degree of rotation? Based upon your understanding you have to design an encoder using the above principle, assume the object is a disk as shown.

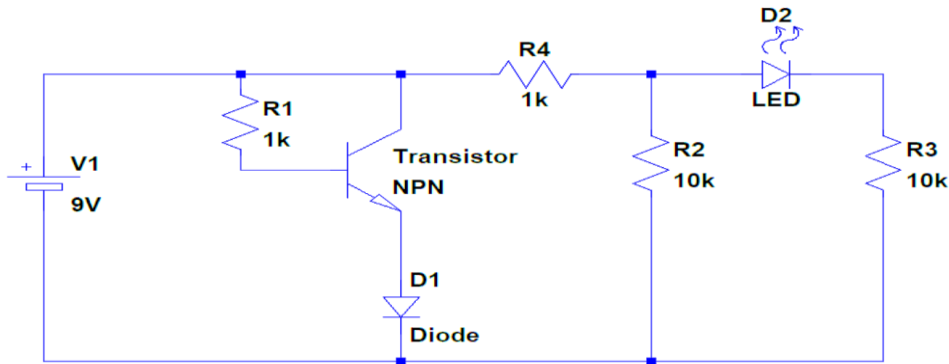
Black Region: Opaque

White Region: Transparent



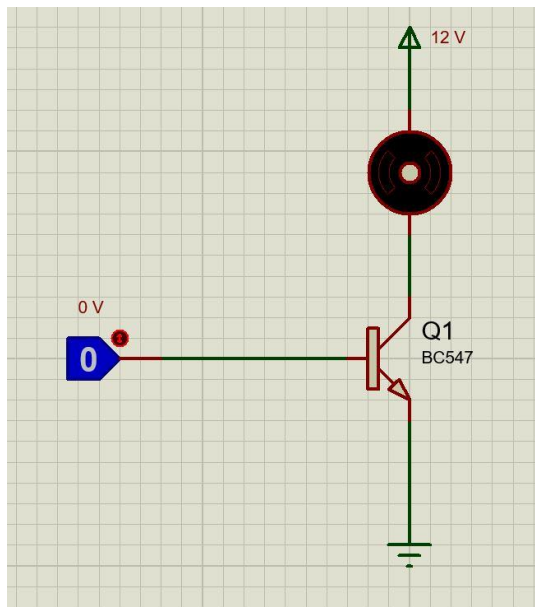
Q2 Suggest another application where we can apply the following principle and explain the device so formed?

Q3

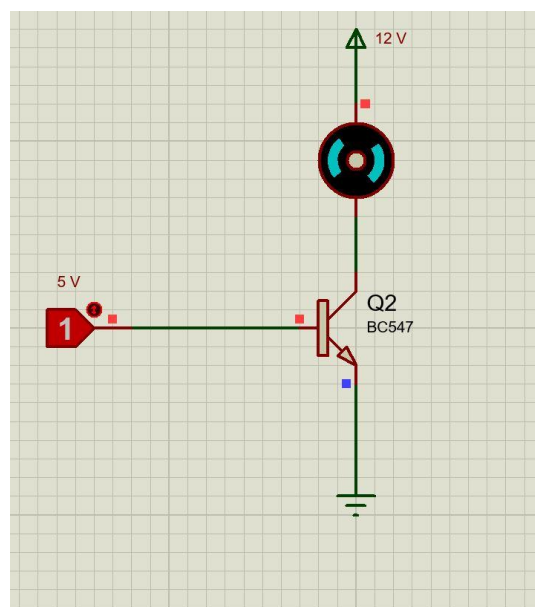


The LED **doesn't** glow. Give reason why that happens and draw the **Corrected** Circuit diagram/s

Q4:



Motor is **OFF**

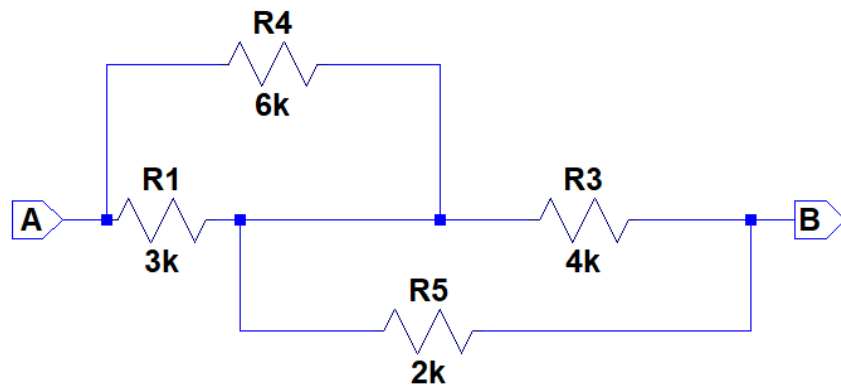


Motor is **ON**

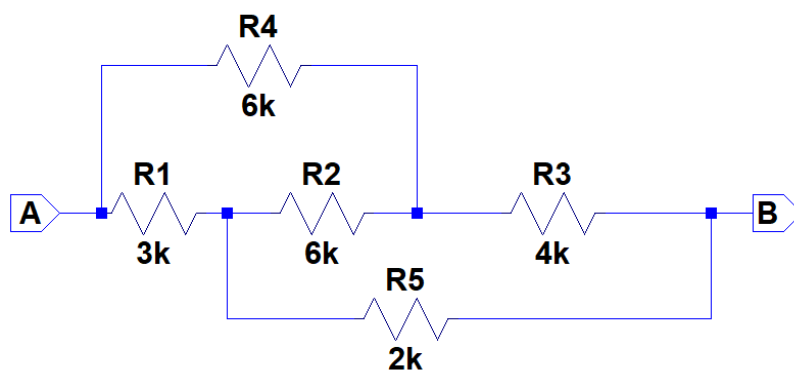
From the above two circuits, design a circuit to drive the motor **Bi-directionally** using 4 such **Transistors** and independent base pulses.

Q5 In the given parts calculate the resistance across the nodes A and B?

1.



2.



The End
Best of Luck