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18CS30042

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18CS30010

PART : 3
(Fault-Tolerant Signal Display)

Aim:

Two signals are to be present, green and red (as LEDs). These are to be driven by transistors circuits. Bit g is to drive the green signal and g' is to drive the red signal. If the green LED fails (becomes an open circuit), the red LED should be lit, instead (even though g=1).

Apparatus Required:

1. BC541 *2
2. 74LS500 *1
3. Green LED
4. Red LED
5. Resistors (4.7K ohm) *2

Theory:

1. LEDs are driven by transistors circuits.
2. LED is connected to the emitter region of the NPN transistor(BC541).
3. +5V is given the collector region of the NPN transistor.
4. LED glows whenever we give input at the base.
5. As the potential is applied at the base, it makes emitter-base junction in forward bias and base-collector in reverse bias, active region, and current-flows, that results in the glow of LED.

Design:

Logic	RED	GREEN
0	1	0
1	0	1
Open Circuit	1	0

a. Whenever '0' or NO input is given Red light glows.
b. Whenever logic '1' is given Green light glows.

Circuit Diagram:
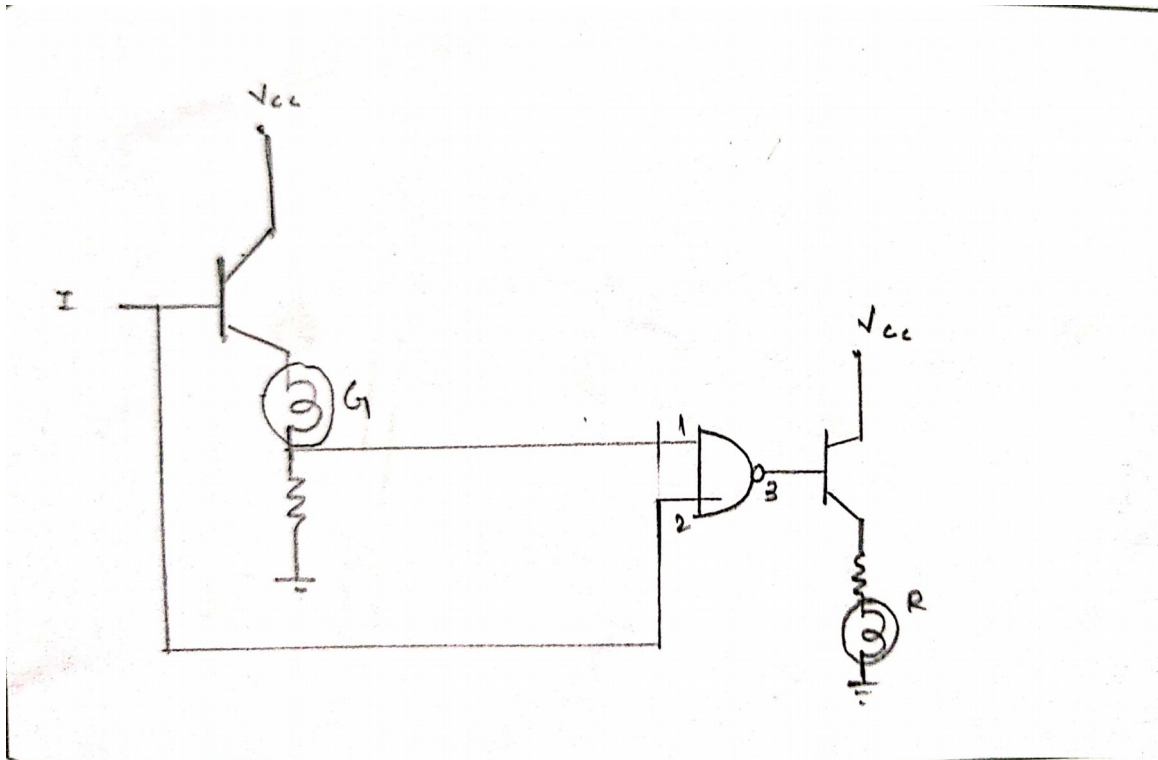
Result:

The results are the same as explained.

Discussion:

a. When the input g is supplied with high input signal, then the LED shows green i.e, green LED glows and the red LED is off and vice versa.