

electronic components - practice problems

1. Why does an LED need to be placed in the correct direction in a circuit?
2. A small red indicator LED has a 2.0 V drop and is connected to a 5.0 V supply through a 150 Ω resistor. What current flows through the LED?
3. Why can thermal runaway be a problem for an LED?

4. A green LED has a 2.2 V drop and should run at 15 mA from a 6.0 V battery pack. What resistor should be placed in series with it?

5. An LED circuit uses a 12 V supply and draws 25 mA when lit. What power is supplied by the battery?

6. A hobby kit has only 100 Ω resistors. About how many identical 100 Ω resistors in parallel are needed to get close to 20 Ω for an LED circuit?

7. Why is a transistor useful as a switch in a logic circuit?

8. A NOT gate uses 5.0 V for high and 0 V for low. If the input is 5.0 V, what output voltage should it produce?

9. An AND gate uses 5.0 V for high and 0 V for low. Input A is 5.0 V and input B is 0 V. What output voltage should it produce?

10. An LED circuit has a 9.0 V battery and should use 20 mA of current. What resistor should be used?

11. How is an OR gate different from an AND gate?

12. An OR gate uses 5.0 V for high and 0 V for low. Input A is 0 V and input B is 5.0 V. What output voltage should it produce?

13. An XOR gate uses 5.0 V for high and 0 V for low. If both inputs are 5.0 V, what output voltage should it produce?