

2003 Electrical Applications Final Problems

Materials and Equipment

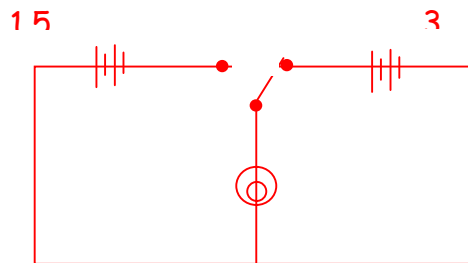
- | | | | |
|---|------------------------|---|------------------------|
| 1 | baseboard | 1 | Push button switch |
| 2 | 6-volt battery holders | 1 | microswitch |
| 4 | 1.5 v AA batteries | 3 | slide switches |
| | wire | 1 | motor |
| 3 | 6v lamps | 1 | motor mounting bracket |
| 1 | buzzer or bell | 1 | SPDT switch |
| 1 | simple push switch | | |

Procedure

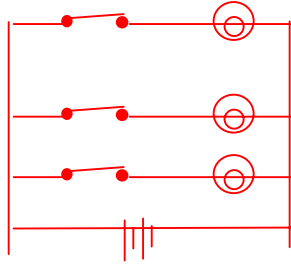
1. Draw a simple schematic for each problem solution, and answer any questions asked in the space below each question.
2. Build a model of your solution using the Tronix components provided.
3. You will need to use the same parts multiple times, so call the judge over to check your solution to each problem before taking it apart to begin the next one.

Problems

1. You have been asked to design a plush animal for a toddler that has a nose that glows brightly when he is happy and glows dim when he is sad.

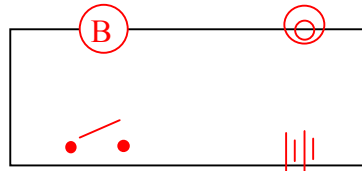


2. A hospital has a room with three beds in it. If one of the patients needs attention they can flip a switch that turns on a light in the nurse's office. Design a system for doing this. Remember, more than one patient could need help at the same time.



3. Joe, who is deaf, wants to be able to know when someone is at the front door. His wife, who can hear perfectly, likes the sound of the doorbell. Design a system that will warn both Joe and his wife when someone is at the door. What type of switch did you choose? Why?

A slide switch would keep the light on until Joe saw it, where a push switch would only turn it on while being held down.



4. Your little sister, Amy, wants to know if the refrigerator light stays on all the time. Construct a model of the lighting system for a refrigerator to demonstrate that the light turns on when the door opens and turns off when it closes. Draw a schematic of you model below. What type of switch did you use? Why?

This solution uses a microswitch wired in the normally closed position. Closing the door operates the switch, turning the light off.