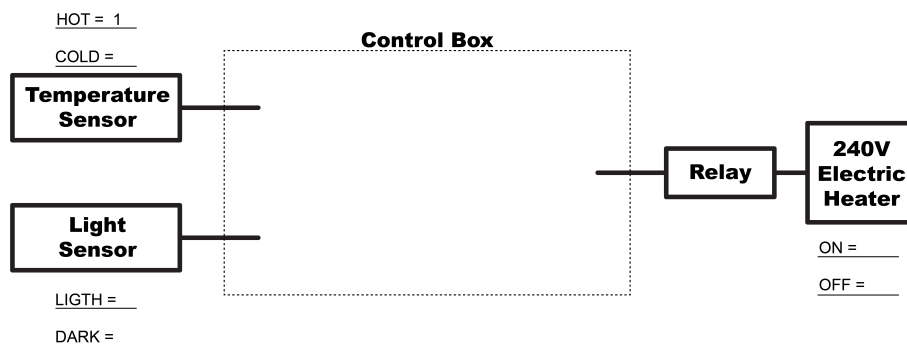


Name:
 Teacher:
 Class:
 Date:

Logic Gate Applications - Practice Problems Set 5
逻辑门运用-练习题5:

1. A public pool installs an automatic heater to keep the swimming pool at a comfortable temperature at all times. The micro control has 2 seasons, a temperature sensor and a light sensor. The temperature sensor has an output of **1** when it is **HOT** and **0** when **COLD**, and the light sensor has an output of **1** when it is **LIGHT** out and **0** when it is **DARK**. An output value of **1** with turn the heater **ON**.

某公共游泳池安装了自动加热器，使游泳池始终保持舒适的温度。微控制器有两个季节，一个温度传感器和一个光传感器。温度传感器在热态时的输出为1，在冷态时的输出为0，光线传感器在熄灯时的输出为1，在黑暗时的输出为0。打开加热器时，输出值为1。



- a) Underline the two types of logic gates that should be used inside the control box.
 在控制箱内应使用的两种逻辑门下面划线。

AND NOT OR

- b) Complete the diagram to show how the two logic gates are used to connect the input sensors to the relay. Use the correct symbol for each logic gate.

完成该图，以显示如何使用两个逻辑门将输入传感器连接到继电器。为每个逻辑门使用正确的符号。

- c) What type of electrical device or component could be used as an input sensor that would respond to temperature?

哪种类型的电子设备或部件可用作响应温度的输入传感器？

i. Component Name名称: _____

ii. Draw the symbol for the component绘制零部件:

- d) What type of electrical device or component could be used as an input sensor that would respond to light?

哪种类型的电子设备或部件可用作对光作出响应的输入传感器？

i. Component Name名称: _____

ii. Draw the symbol for the component绘制零部件:

- e) Complete the truth table for the control system.
完成控制系统的真值表。

Temperature Sensor	Light Sensor	Heater
0	0	
0	1	
1	0	
1	1	

- f) Why must a relay be used to operate the heater?
为什么必须使用继电器来操作加热器

- g) Modify the design of this circuit to add a manual override switch. The modified circuit still needs to turn the heater on automatically based on the original conditions, but also needs to allow an operator to turn on heater manually.
修改此电路的设计以添加手动超越控制开关。修改后的电路仍然需要根据原始条件自动打开加热器，但也要允许操作员手动打开加热器。

Draw the circuit here:

- h) Explain how this circuit works.
解释其工作原理。
