

10. A circuit used in a fridge is shown in Figure Q10.

Marks

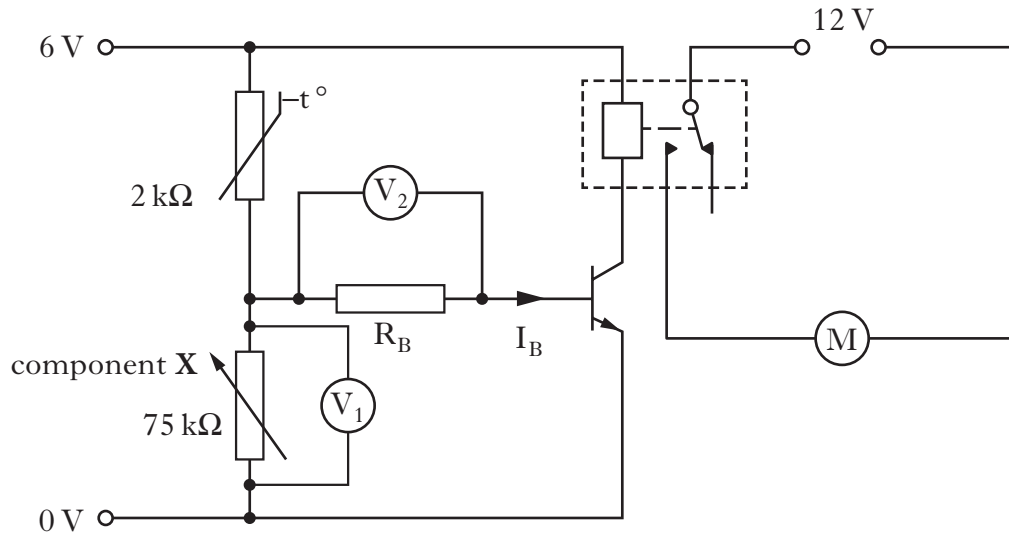


Figure Q10

(a) State, with reference to the Data Booklet, the temperature when a type 1 thermistor has a resistance of $2\text{ k}\Omega$.

_____ 1

(b) (i) State the name of **component X**.

_____ 1

(ii) Describe the **function** of component X in the circuit.

_____ 1

(c) Calculate the voltage shown on V_1 .

2

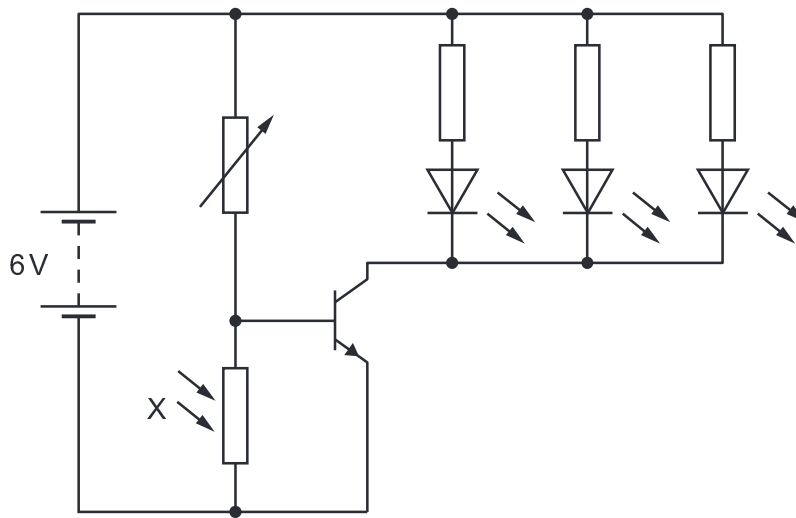
When the temperature drops, $V_1 = 1.6\text{ V}$ and the transistor saturates.

(d) Calculate the voltage shown on V_2 .

2



12. The circuit used in a bicycle light is shown below.



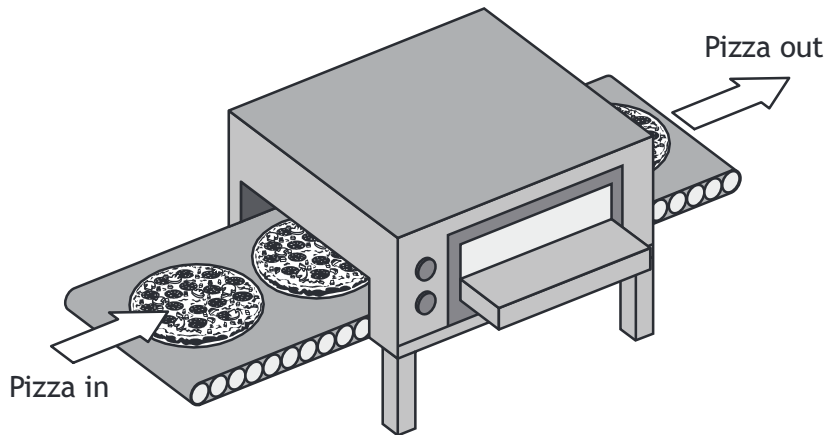
(a) State the full name of component X shown in the circuit. 1

(b) Describe the operation of the circuit. 4

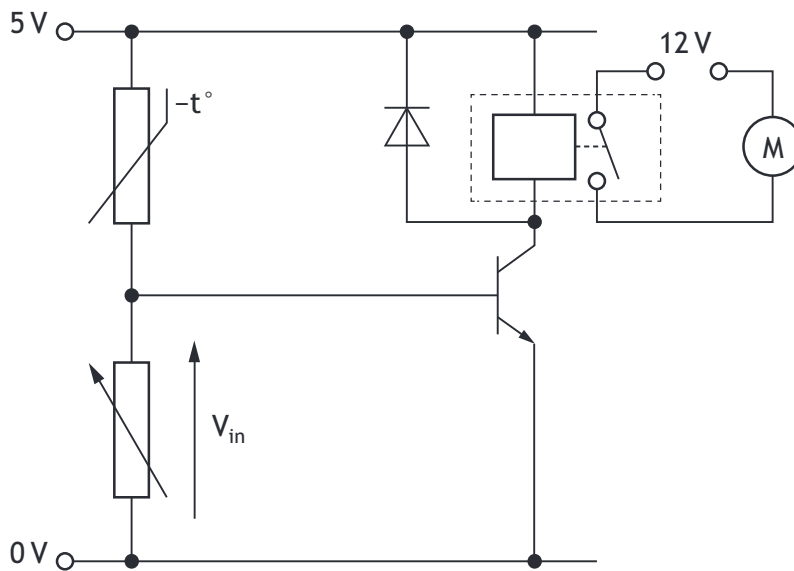
(c) (i) Describe one advantage of wiring the LEDs in parallel rather than in series. 1

(ii) Describe why LEDs were used in preference to lamps. 1

16. Pizzas are cooked when they move through an oven on a motorised conveyor.



An electronic circuit will switch on the conveyor when the oven increases to a set temperature.



(a) Describe, as the temperature increases, the operation of the:

(i) input sub-system;

2





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16. (a) (continued)

(ii) process and output sub-systems.

2

(b) Describe the **function** of the following components in the circuit.

(i) relay

1

(ii) diode

1

[Turn over



* X 7 2 3 7 5 0 1 2 1 *