Udemy Course: Electronics
Instructor: Teacher KAGWE MUNRO

Video: The Thermistor

Video Deconstruction Document

Instructions:

This document has 8 pages. Answer these questions after watching the video or as you watch the video. You may find it useful to pose the video from time to time.

QUESTIONS

Question 1

What is a thermistor?

CHECK ANSWER TO QUESTION 1

Question 2

What is a NTCT?

CHECK ANSWER TO QUESTION 2

Question 3

Draw the symbol for the thermistor

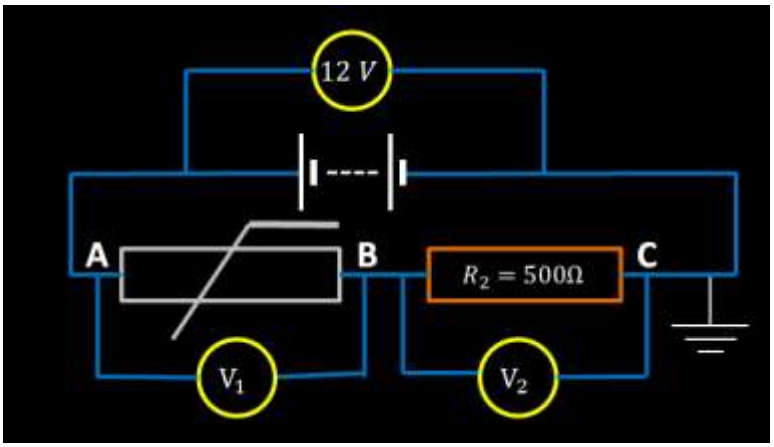
CHECK ANSWER TO QUESTION 3

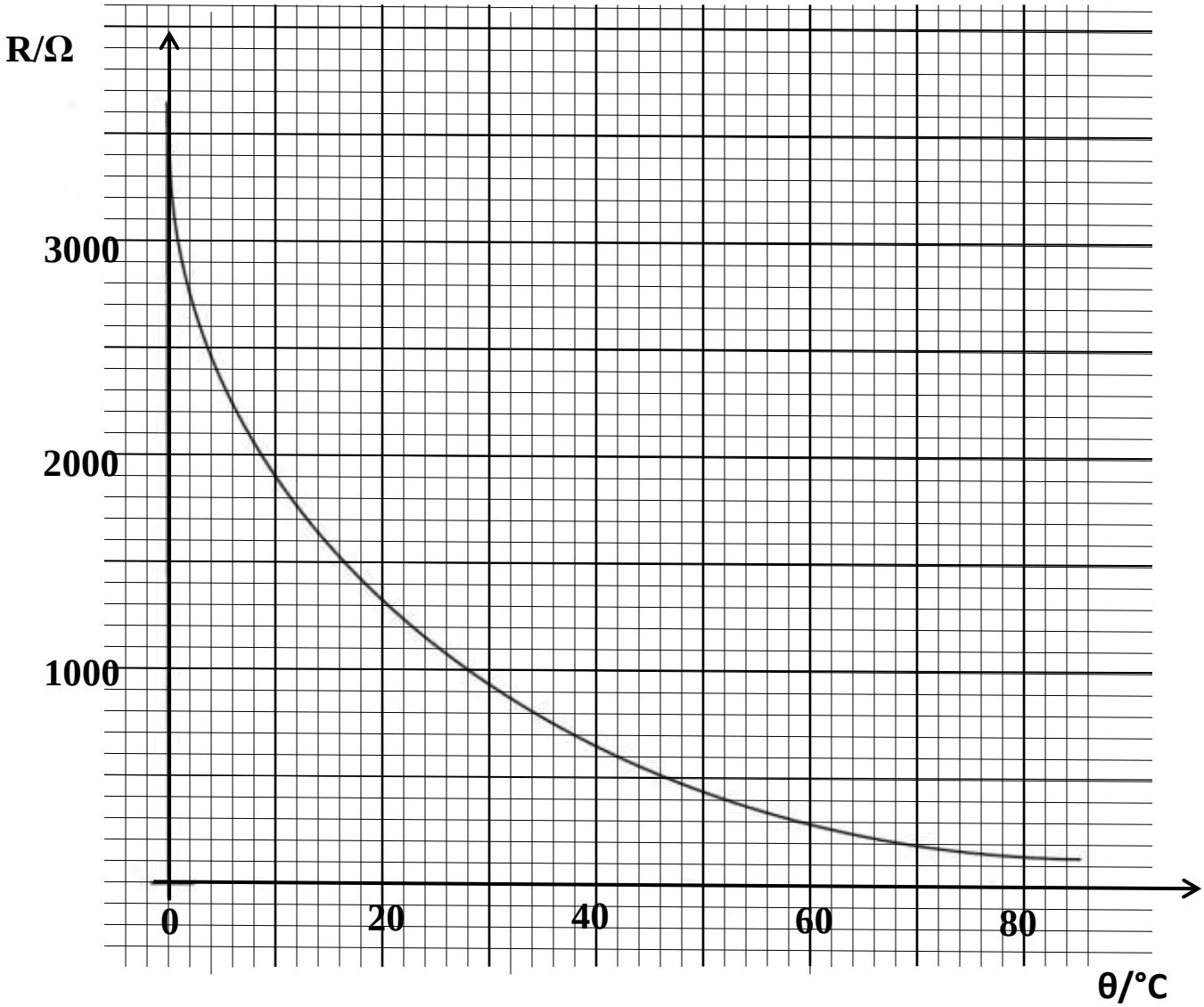
Harder Question

Question 4

The diagram shows a potential divider circuit which incorporates a thermistor. The graph shows how the resistance of the thermistor (R_1) changes with temperature. Use the graph to determine the values of **potential at point A** (V_A), **potential difference across R_1** (V_1), **potential at point B** (V_B), **Potential difference across R_2** (V_2) and **potential at point C** (V_C) at various temperatures as indicated in the table.

i. Describe how the potential at point B changes with rise in temperature
ii. How could the trend be reversed with rise in temperature?
iii. Determine the temperature at which the potential at point B is 6.0 V


12 V
A
B
C
$R_2 = 500\Omega$
V_1
V_2

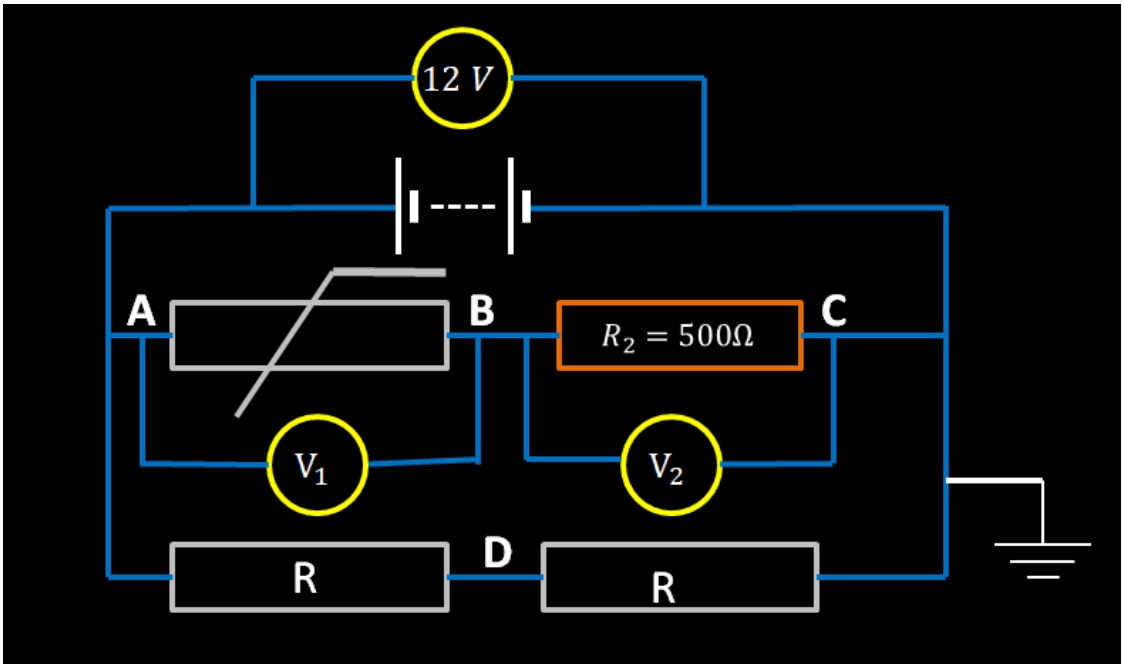

R/Ω
3000
2000
1000
0
20
40
60
80
θ/°C

θ/°C	0	10	20	30	40	50	60	70
R_1								
V_A								
V_1								
V_B								
V_2								
V_c								

CHECK ANSWE TO QUESTION 4

Question 5

A fixed potential divider is **added** to the figure in question 4, as shown below:



i. What is the potential at point D
ii. At what temperature is the potential at B equal to potential at point D?
iii. At what temperature range is the potential at point B higher than potential at point D?
iv. At what temperature range is the potential at point B lower than potential at point D

CHECK ANSWER TO QUESTION 5

ANSWERS

Answer to question 1

A thermistor is a component or transducer whose resistance changes with change in temperature.

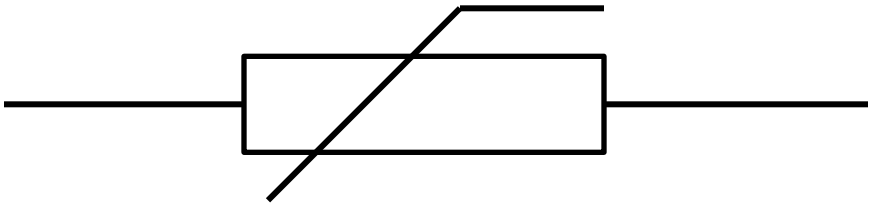
BACK TO QUESTION 1

Answer to question 2

The abbreviation “NTCT” stands for “Negative Temperature Coefficient Thermistor” is a thermistor whose resistance decreases with rise in temperature

BACK TO QUESTION 2

Answer to question 3



BACK TO QUESTION 3

Answer to question 4

θ/°C	0	10	20	30	40	50	60	70
R_1	3200	1900	1350	950	650	450	300	200
V_A	12	12	12	12	12	12	12	12
V_1	10.4	9.5	8.6	7.9	6.8	5.7	7.2	3.4
V_B	1.6	2.5	3.4	4.1	5.2	6.3	4.8	8.6
V_2	1.6	2.5	3.4	4.1	5.2	6.3	4.8	8.6
V_c	0	0	0	0	0	0	0	0

i. As temperature rises the potential at point B also rises also (as evidenced from the table above)

ii. This trend can be reversed with rise in temperature by interchanging the postion of the thermistor with that of the 500 – ohm resistor

iii. For potential at point B to be 6 V (i.e. half of the total supply voltage) then the resistance of the thermistor must be equal to that of the 500-ohm resistor. That is, the resitance of thermistor must be 500 ohms. From the graph it can be shown that the thermistor has a resisitance of 500 ohms at a temperature of 47°C.

BACK TO QUESTION 4

Answer to question 5

i. Potential at point D is 6 V
ii. 47 °C
iii. Potential at point B will be higher than potential at point D for temperatures less than 47 °C
iv. Potential at point B will be less than potential at point D for temperatures greater than 47 °C

BACK TO QUESTION 5