27. Internationale Elektrotechnik-Olympiade der Schulen der Euroregion Neisse

NEISSE-ELEKTRO 2021

Exercise #1

Topic: Networks with resistors, Power

You will find the official formula sheet for the exam here: [hszg.de/neisse-elektro --> Aufgaben --> formula sheet, Formelsammlung_2019.pdf]

1) Calculate the current for a 10Ohm resistor at 240V. How much Power does the resistor dissipates to heat? How does the Power change with half the voltage?

2) The Resistor from 1) is connected to a second resistor with same value on same voltage. Calculate current I and Power P for each if

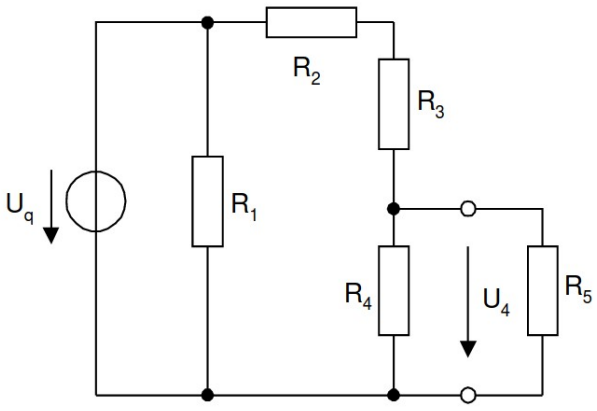
a) they are in series

b) they are parallel.

3) You can calculate the resistance R from the same values as you calculate the Power P. Write all possible ways to calculate all the four values from all possible input parameters.

4) Calculate all currents and all voltages in the following network with $U_4 = 12V$. Find a formula to calculate the equivalent resistance for R_2, R_3, R_4 and R_5.

$R_1 = 10\ k\Omega$
$R_2 = 400\ \Omega$
$R_3 = 600\ \Omega$
$R_4 = 100\ \Omega$
$R_5 = 50\ k\Omega$



You are invited to work on a collaborative document for the solution:
https://pad.gwdg.de/OedZi2wnQFi1BHsG7RQGMw