

task_w3wf215v2u98ty07_with_calculation

Student Group

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efficiency, charges, power, exam ee1 SS2023

Exercise E9 Efficiency (written test, approx. 14 % of a 60-minute written test, SS2023)

A. (10 points) A battery with an electromotive force \mathcal{E} and an internal resistance R_i is connected to a load resistor R_L . The battery shall provide energy for a device with an load resistance of $R_L = 2 + 0.05 R_i$. The following values are from the data sheet:

begin{align*} \text{Solution:} \end{align*}

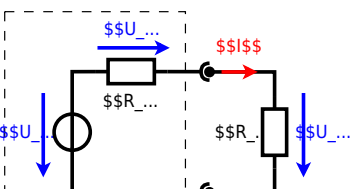
• \Omega \text{ verify: } 200 \Omega \text{ in } 0.1 \text{ A } \Omega \end{align*}

lowest efficiency to highest stream feed for R_L modes (max) in this case, the

.. Efficiency equivalent circuit diagram with the internal resistance and an external load.

label of charges and currents: $Q = 2.6 \text{ Ah}$ & $\eta = 1 - \frac{R_i}{R_L} \cdot \frac{I_{Dis, max}}{U_S} = 1 - 0.05 \cdot \frac{3 \text{ A}}{3.5 \text{ V}}$

Result



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