

Modelling and control summaries

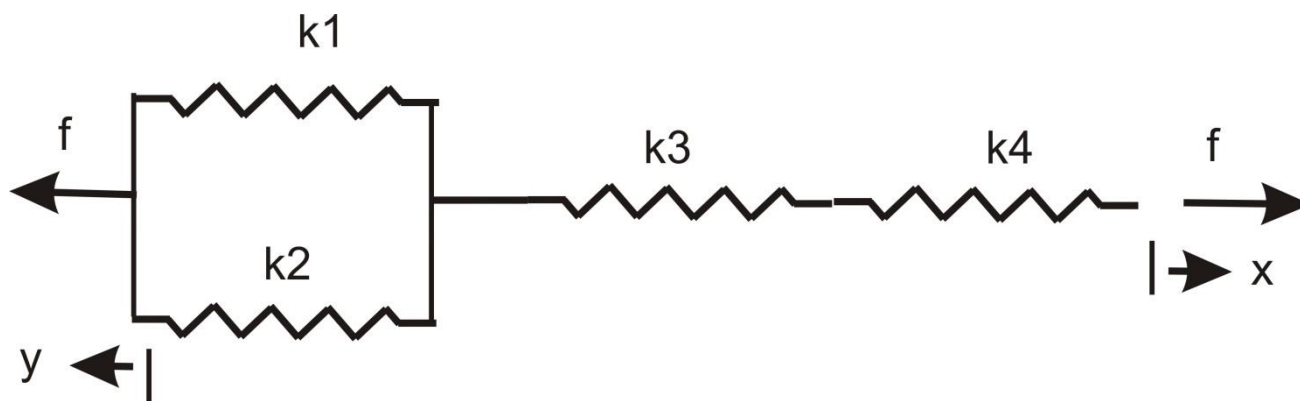


by Anthony Rossiter

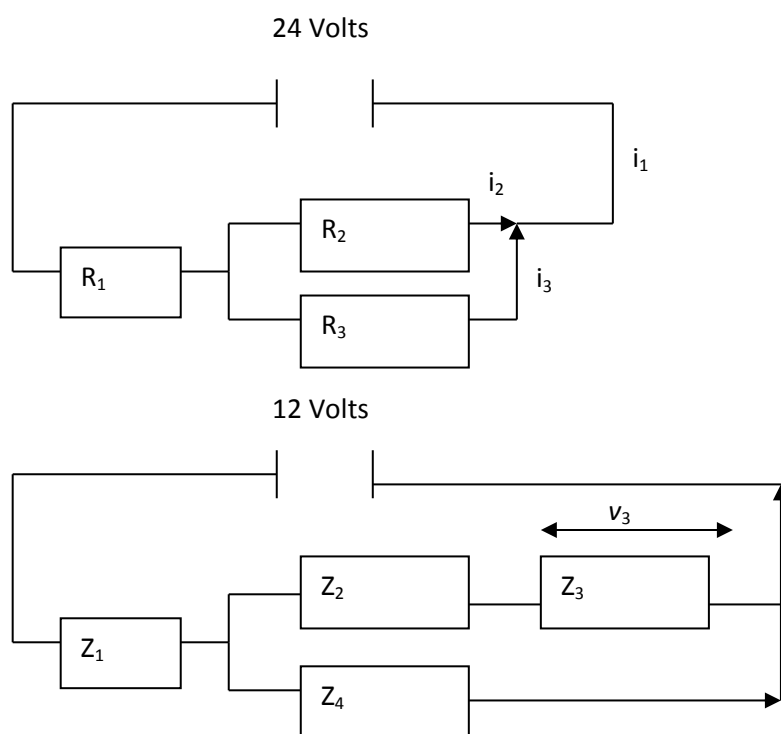
Modelling principles and analogies 8:

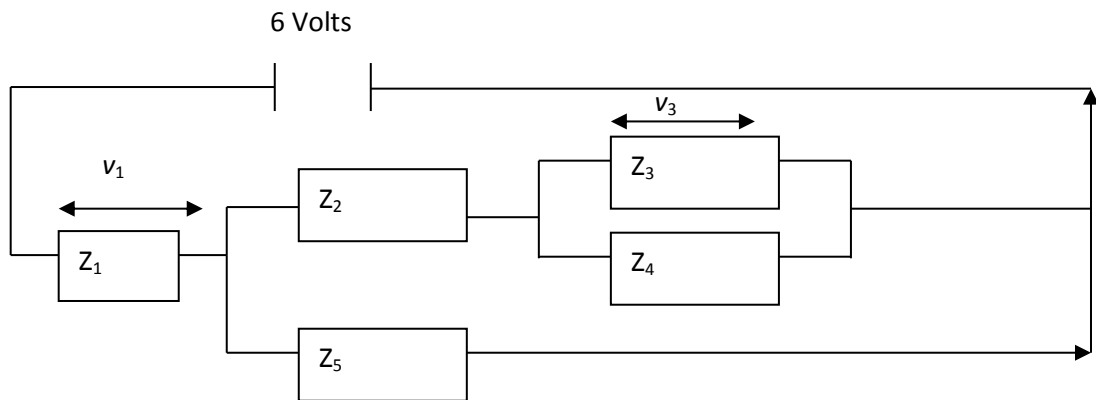
Tutorial sheet on analogies

1. Find a system of resistors which is analogous to the following system of springs.



2. Find a system of springs which is analogous to the following electrical circuits.





3. What are the analogies between pipes carrying fluid and resistors?

4. What are the analogies between heat conductors and pipes?

5. Why is an understanding of analogies useful?

CONCISE ANSWERS

1. An electrical circuit with 3 parallel paths; one path has resistors R_1 and R_2 in series and the other paths contain R_3 and R_4 .

2a. Springs k_2 and k_3 are arranged in series, both in parallel with k_1 .

2b. k_2 and k_3 in parallel to form k_{23} . k_{23} and k_4 in series to form k_5 . k_5 and k_1 in parallel.

2c. k_3 and k_4 in series to form k_{34} . k_2 and k_{34} in parallel to form k_{234} . k_{234} in series with k_5 to form k_6 . k_6 in parallel with k_1 .

3-5 are bookwork.