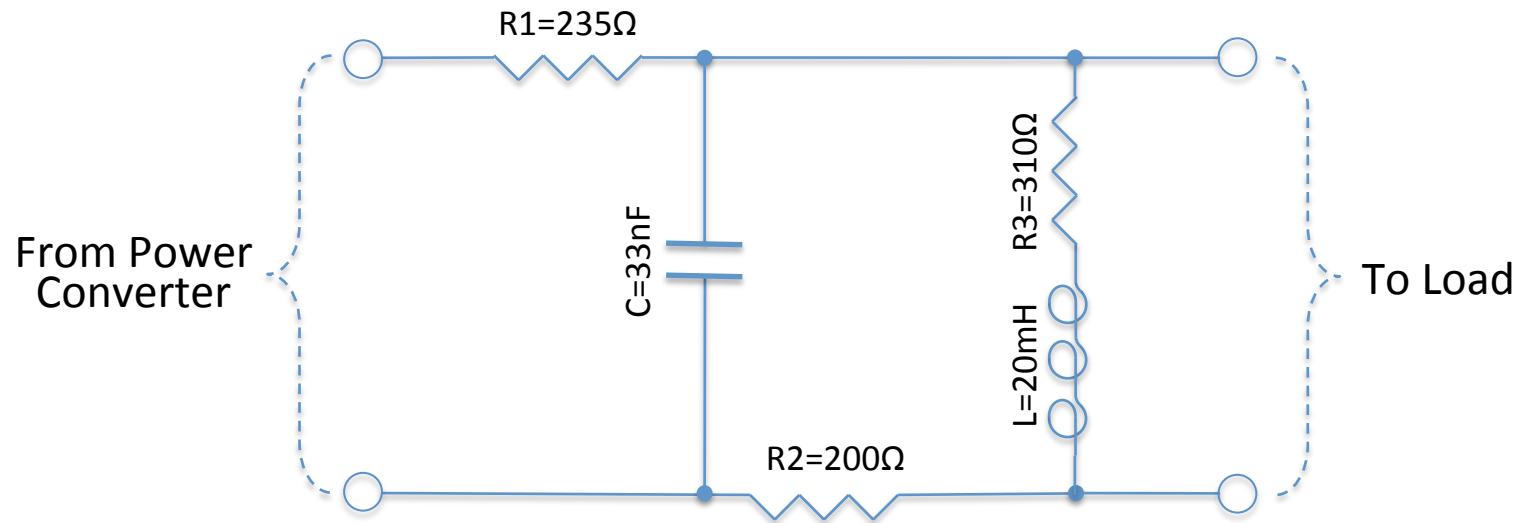


Elec4123, S1/2017 – Energy Systems Elective Design

Topic: Transmission Line Specs-V1 (7 boxes)



Explanatory Story:

- You are trying to transmit power through cabling in an old disused mine. The inductive component in the cable model comes from rotating machinery which is non-functional, but presents an unwanted load you have to deal with.

Notes:

- $R3$ includes nominal series resistance associated with inductor, L
- Nominal values are subject to typical $\pm 10\%$ tolerance

Performance parameters:

- $X = 1.0\text{W}$ (target power in load) – N.B. it is theoretically possible to achieve 1.2W
- $E = 20\%$ (target power transfer efficiency) – N.B. it is theoretically possible to achieve $\sim 32\%$
- We reserve the right to modify the above parameters slightly if warranted, but this is unlikely.