Preparation

Student Group

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Preparation

Do math right

- calculate fractions in fractions (complex fractions) correct
  - Be aware which is the longest fraction line:
    $$\begin{align*} {{{A}\over{B}}\over{C}} \quad &\neq \quad {{A}\over{{B}\over{C}}} \\ {{{A}\over{B}}\over{C}} = {{A}\over{{B}\cdot{C}}} \quad &\neq \quad {{A}\over{{B}\over{C}}} = {{A\cdot C}\over{B}} \end{align*}$$
  - Be aware how to reduce complex fractions by multiplying numerator and denominator with a factor:
    $$\begin{align*} { { {{5 \cdot {{1}\over{x}} } \over {5 + {{1}\over{x}} } } } \over { 7 + {{2}\over{x}} } } &\xrightarrow{either} &&{ { {{5 \cdot {{1}\over{x}} } \over {5 + {{1}\over{x}} } } \cdot \color{blue}{{| \cdot x}\over{| \cdot x}} } \over { 7 + {{2}\over{x}} } } && = { { {{5 } \over {5x + 1 } } } \over { 7 + {{2}\over{x}} } } \\ &\xrightarrow{\quad or \quad} &&{ { {{5 \cdot {{1}\over{x}} } \over {5 + {{1}\over{x}} } } } \over { 7 + {{2}\over{x}} } } \cdot \color{blue}{{| \cdot x}\over{| \cdot x}} = { { {{5 \cdot {{1}\over{x}} } \over {5 + {{1}\over{x}} } } \cdot \color{blue}{{| \cdot x}\over{ }} } \over { 7 + {{2}\over{x}} } } \cdot \color{blue}{{ }\over{| \cdot x}} && = { { {{5 } \over {5 + {{1}\over{x}} } } } \over { 7x + 2 } } \end{align*}$$
    So please never never multiply in such cases all numerators and denominator with the factor…
- Rearrange fractions correct: based on $\beta = {{I_C}\over{I_B}}$ on **cannot** derive $I_B = {{\beta}\over{I_C}}$..

Do physics right

- Do not miss the units. For physical properties these are not allowed to be neglected.
- Check the units. e.g. dB cannot be converted in V
- Once multiple components with indices are given (e.g. C_1, C_2) write down the indices every time, except $C_1 = C_2$ is explicitely given.
- Check your (mis)conceptions on impedances
  - Check whether Z or $\underline{Z}$ is needed in formulas: $Z=|\underline{Z}|\neq \underline{Z}$
  - impedances are not (only) resistors, at least do not think of R is given as $\underline{Z}$.
    For purely ohmic components the other way around is correct: $\underline{Z}=R$.
  - However, impedances 'act' like ohmic resistors in formulars.
    E.g. for the series circuit: $R_{eq}=R_1+R_2+R_3+... \rightarrow \underline{Z}_{eq}=\underline{Z}_1+\underline{Z}_2+\underline{Z}_3+... $
- A resistor does not have a continuous line through:

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- circuits have to be closed, at least with giving voltages with arrows.
  So, the in the following imgage the left side circuit is not correct:

Do exam right

- Do not miss out questions. Sometimes there is more than one answer required.
- Please add your solution path. Once only a wrong final result is given the grading will be 0. When you at least give the correct basic formula there is the chance that you can get at least some reward..