Homework 7

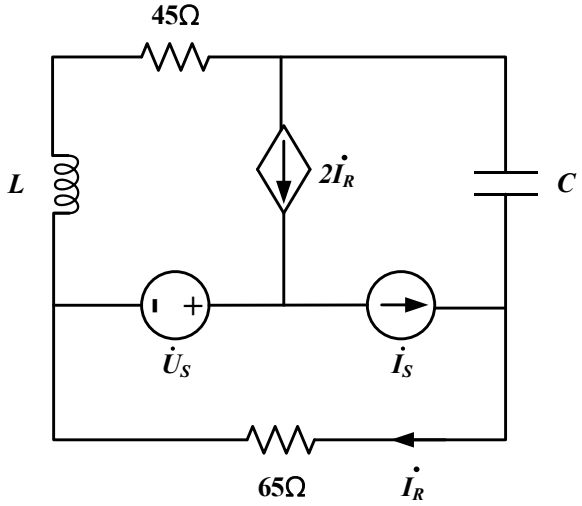
Due date: Jan. 2nd, 2024

Turn in your hard-copy hand-writing homework in class

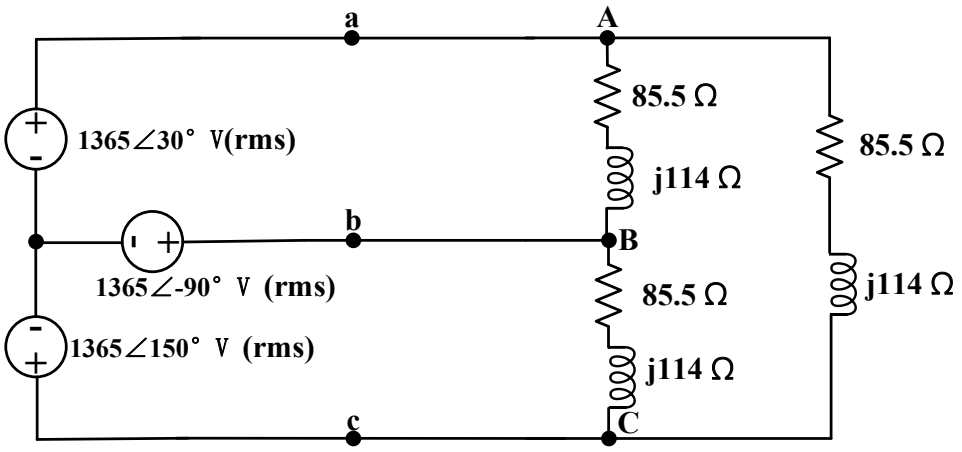
Rules:

- Work on your own. Discussion is permissible, but extremely similar submissions will be judged as plagiarism.
- Please show all intermediate steps: a correct solution without an explanation will get zero credit.
- Please submit on time. No late submission will be accepted.
- Please prepare your submission in English only. No Chinese submission will be accepted.

1. For the circuit below, $\dot{\boldsymbol{U}}_{\boldsymbol{S}}$ =100∠0° V (rms), $\dot{\boldsymbol{I}}_{\boldsymbol{S}}$ =2∠0° A (rms), $\boldsymbol{\omega L}$=30 Ω, 1/$\boldsymbol{\omega C}$ =90 Ω, find the complex power delivered by **voltage and current source**.



2.For the circuit below, find $\dot{I}_{AB}$, $\dot{I}_{BC}$, $\dot{I}_{CA}$, and $\dot{V}_{CA}$in the circuit.

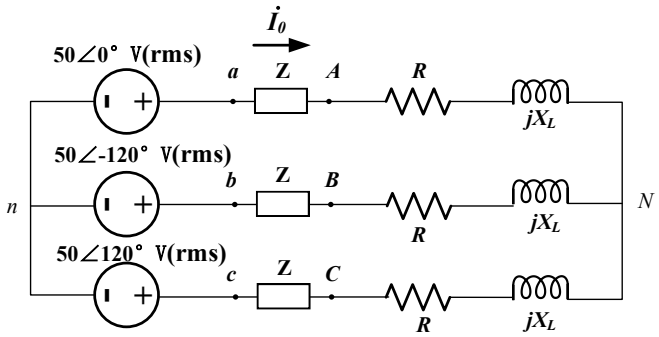


3. Consider the following three-phase circuit. R=20 Ω, jX_L = j5 Ω, Z= （1+j0.5） Ω.

(1) Calculate the **line current I_0**.

(2) Calculate **the voltage U_{AB}**.

(3) Calculate the total complex power absorbed by **all the loads including Z, R and jX_L**.

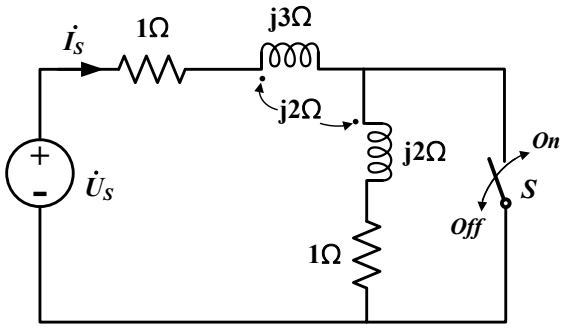


4. For the circuit below, $\dot{U}_S$ =80∠30° V (***Phasor expressed by amplitude***), find

(1) The current $\dot{I}_S$ for switch ***S is* off** .

(2) The complex power delivered by **voltage source** when ***S is* off.**

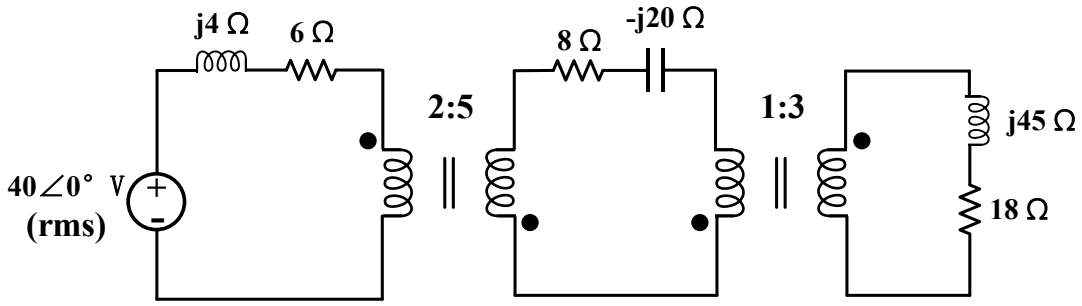
(3) The current $\dot{I}_S$ when the switch ***S is* on**.



5. For the circuit below, please find:

(a) The average power released by the source.

(b) The average power delivered to the 18Ω resistor.



6. For the following circuit, please find current I_0