Homework 6

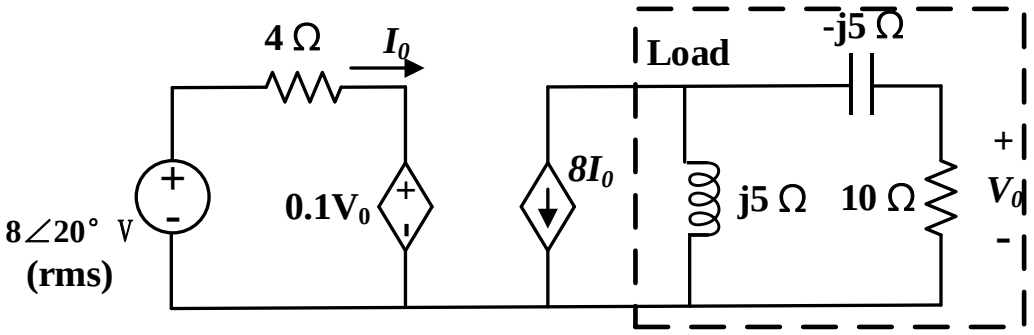
Due date: 29th Nov.

Turn in your homework in class

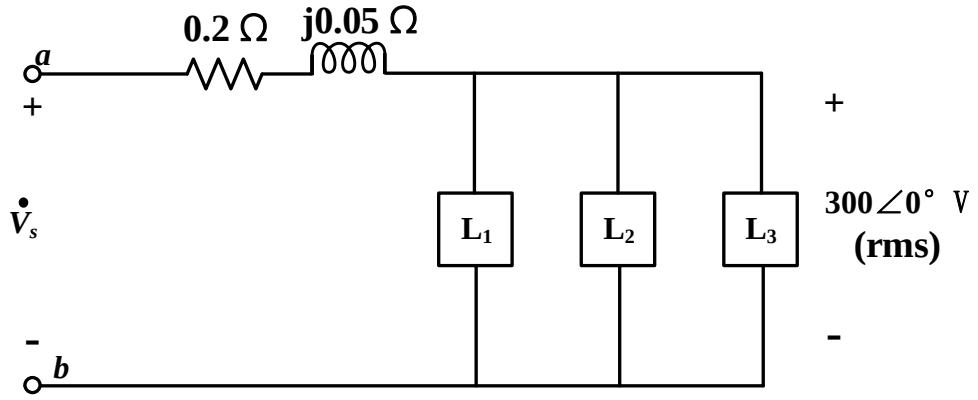
Rules:

- 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.

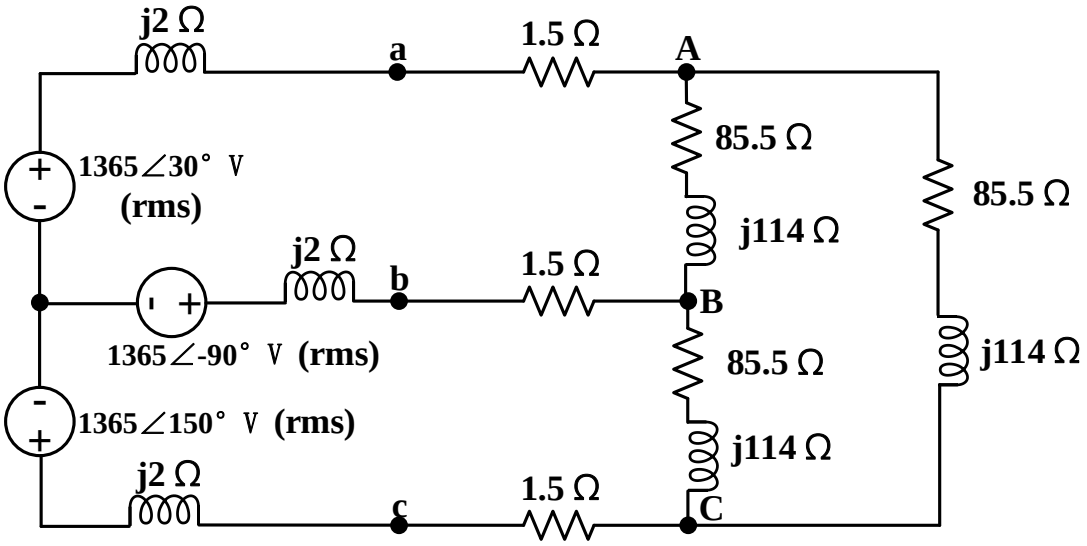
1. For the circuit below, please find:
   (1) The average power absorbed by the load;
   (2) The reactive power absorbed by the load;
   (3) The complex power **S** absorbed by the load;
   (4) The power factor pf of the load.



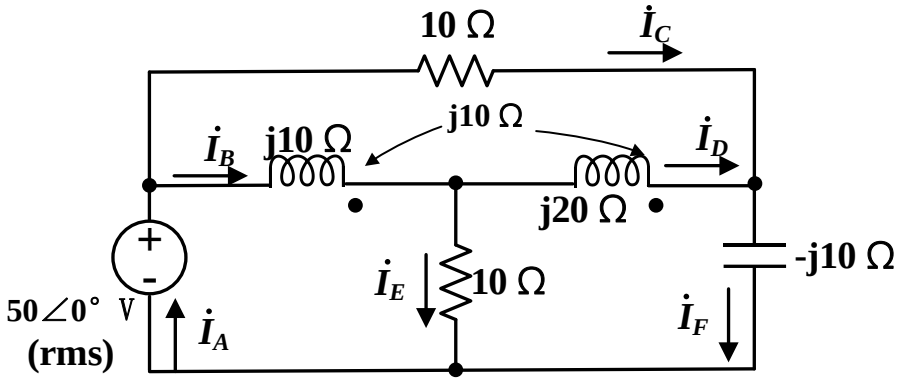
2. For the three-load circuit shown below, L_1 absorbs 3 kW at unity power factor; L_2 absorbs 5 kVA at 0.8 leading; L_3 absorbs 5 kW and delivers 6 kvars.
   (1) Calculate the voltage $\dot{V}s$.
   (2) Calculate the average power and reactive power associated with the line impedance (0.2Ω+j0.05Ω).
   (3) Calculate the average power and reactive power between port **a** and port **b**.



3. For the circuit below,
   (1) Find $\dot{I}_{AB}$, $\dot{I}_{BC}$, $\dot{I}_{CA}$, and $\dot{V}_{CA}$ in the circuit.
   (2) What percent of the average power delivered by the three-phase source is dissipated in the three-phase load?



4. For the circuit below, please find:
   (1) Current $\dot{I}_D$, $\dot{I}_E$, and $\dot{I}_F$
   (2) The complex power on the capacitor, and the power factor pf of the capacitor.



5. For the circuit below:
   (a) Find the average power delivered to the 8Ω resistor.
   (b) Find the average power generated by the ideal sinusoidal source
   (c) Find the impedance of Z_{ab}