VE215 2022Fall Assignment 6

Due Date: 23:59, December 5th, 2022

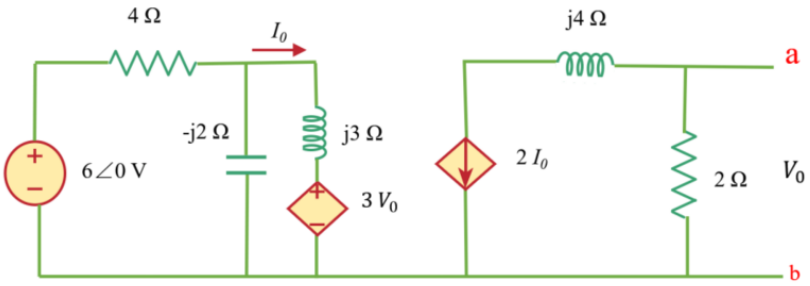
In order to get full marks, you shall write all the intermediate steps of calculation or proof unless otherwise indicated.

Exercise 6.1 (40%)

(a) For the given circuit, please calculate the total apparennt power $|S|$, total real power P, total reactive power Q and the total power factor.

(b) Suppose an impedance load Z_L is connected between a and b. Please calculate the value of Z_L that will absorb the maximum power and the value of that maximum power if

- Z_L is an impedance load
- Z_L is a pure resistance load



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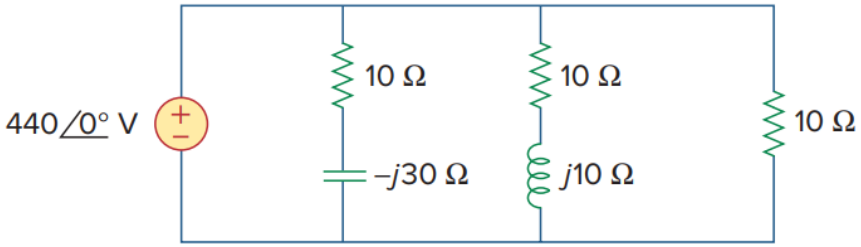
Exercise 6.2 (30%) Consider the power system shown below. Calculate:
(a) the total complex power
(b) the power factor
(c) the parallel capacitance necessary to establish a unity power factor



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Exercise 6.3 (30%)
Given the circuit below, calculate the equivalent impedance in each of the blocks. Also find I_o and the overall complex power supplied.