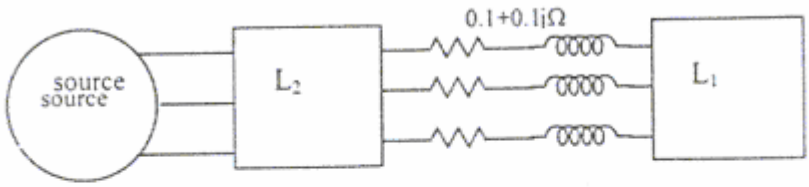
Problem 4:

a) A balanced 3ϕ Y connected load draws 6 kW at a power factor of 0.8 lagging. A balanced Δ connected capacitors are to be placed in parallel to this load, so that the power factor is increased to 0.9 lagging. If the frequency is 50 Hz and line-to-line to voltages of load and capacitor bank is 350 V (rms), find the required capacitance per phase.

b) If this compensated load is connected to a balanced 3ϕ source through a line impedance of (2+3j) Ω, find the rms values of the line-to-line voltage and power factor at the source side.

Answers: a) 13.8μF, b) 410.5 V (rms)

Problem 5:



A balanced three-phase load L_1 of 32 kW at 0.8 power factor lagging is supplied through a transmission line of impedance 0.1+j0.1Ω/phase. The voltage accross L_1 is 380 volts (rms) line to line. The other phase load L_2 of 10 kVA at 0.707 power factor lagging is connected at the source side of the line.

a) determine the magnitude of the line-to-line voltage across L_2.
b) determine the overall power factor at the source side of the load L_2.

Answers: a) 394.8 V (rms) b) 0.78 lagging