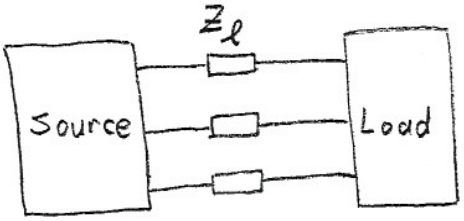
1)



A balanced 3-phase circuit.

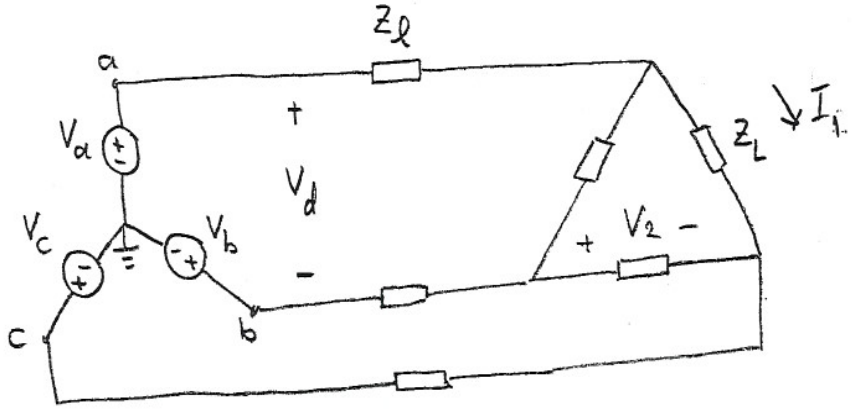
Load : 12 KVA, $pf_L = 0.8$ lagging

$P_{source} = 12$ KW

$Z_\ell = \frac{1}{2} + j\frac{3}{4}\ \Omega$

Find the effective line voltages at the load and source ends.

2)



$f = 50$ Hz

Z_ℓ is inductive.

A balanced 3-phase circuit. The phase sequence is a-b-c.

(a) $S_L = 48 + j24$ KVA, $|S_s| = 75$ KVA, $V_d = 500\angle 60^\circ$ Vrms

Percent efficiency: 80 %,

Find I_1, Z_L, Z_ℓ, V_2.

(b) A capacitor bank is connected in parallel with the load.

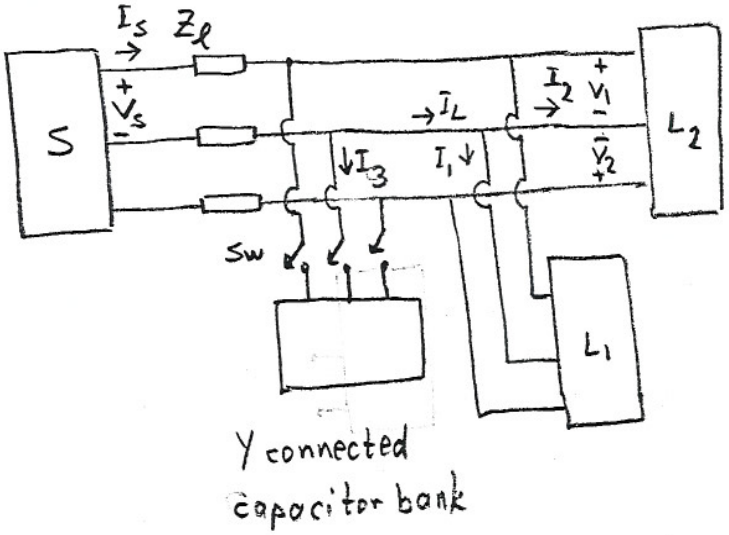
S_L is as above.

The real power delivered to the lines is reduced by 19 %.

Find the capacitance of each capacitor.

What is the (new) effective value of V_d.

3)



$V_1 = V_m \angle 30^\circ$

$V_2 = V_m \angle -30^\circ$

$f = 50$ Hz

$Z_\ell = 0.1 + j0.8\ \Omega$

A balanced 3-phase circuit.

L_1: $S_{L_{1m}} = 45$ KVA, $PF_1 = 0.8$ lagging

L_2: $S_{L_{2m}} = 9\sqrt{17}$ KVA, inductive

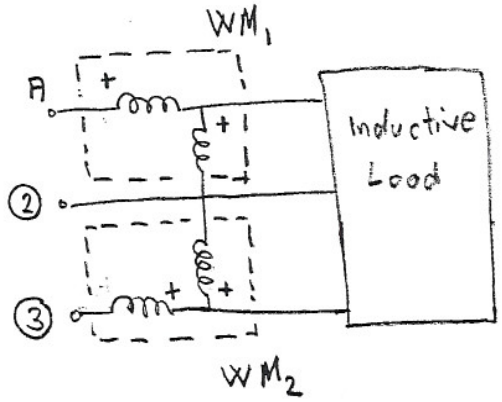
(a) Sw is open. $P_s = 75$ KW, $P_\ell = 3$ KW.

Find V_m, I_1, I_2, I_L, V_s, the percent efficiency.

(b) Sw is closed. The power factor of L_1-L_2-Capacitor Bank combination is 0.96 lagging. (V_m, S_{L_1}, S_{L_2} are as above.)

Find the capacitance of each capacitor, I_3, I_s, V_s, S_s and the percent efficiency.

4)



A balanced 3-phase load.

The phase sequence is positive.

The wattmeter readings:

WM_1: 800 W, WM_2: 200 W

(a) Determine the real and reactive powers delivered to the load.

(b) Should we label the terminal ② as B or C?