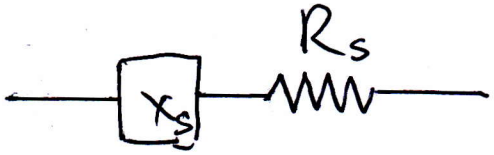
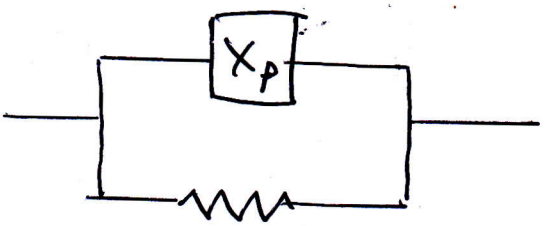
CONVERTING BETWEEN SERIES AND PARALLEL



$$Q = \frac{X_s}{R_s}$$



$$Q = \frac{R_p}{X_p}$$

THESE NETWORKS LOOK IDENTICAL TO THE OUTSIDE WORLD.

$\Longleftrightarrow$

$$R_s = \frac{R_p}{Q^2+1}$$

$$X_s = Q R_s$$

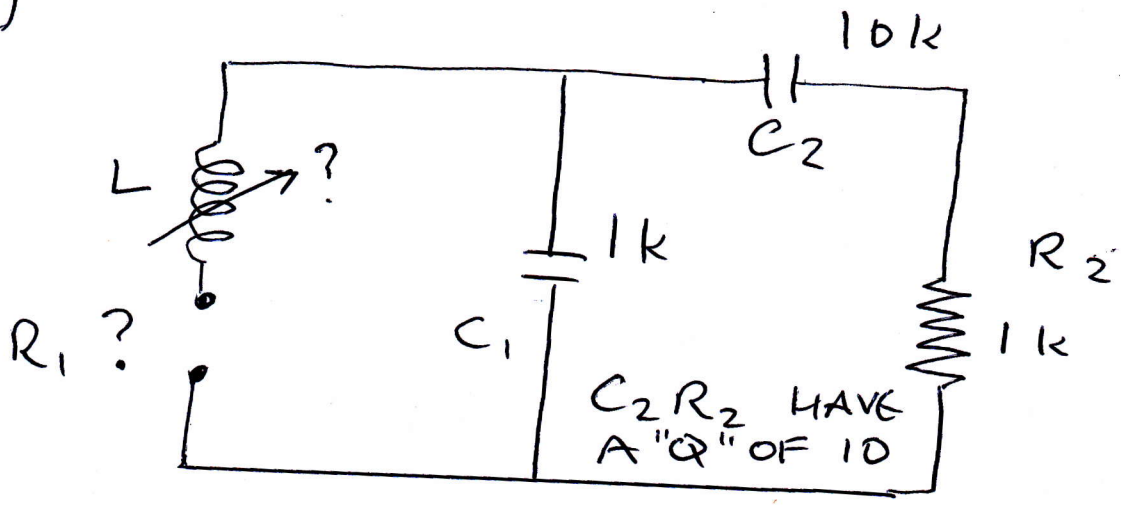
$$R_p = R_s (Q^2+1)$$

$$X_p = \frac{R_s}{Q}$$

IN MOST CASES WE CAN USE Q^2 AS AN APPROXIMATION FOR Q^2+1.

THE TWO NETWORKS HAVE THE SAME Q AND PHASE ANGLE.

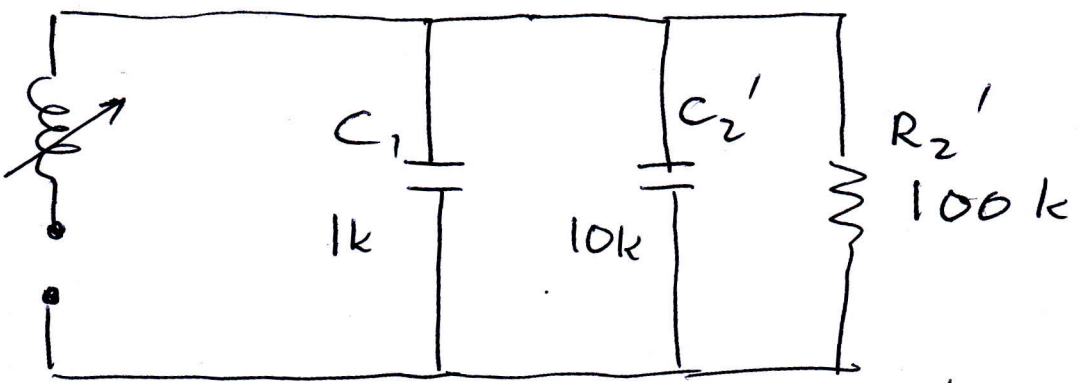
(1)



THE NECESSARY INDUCTANCE IS NOT INITIALLY KNOWN. IT HAS TO BE ADJUSTED TO OBTAIN RESONANCE.

CONVERT C_2 AND R_2 INTO A PARALLEL COMBINATION.

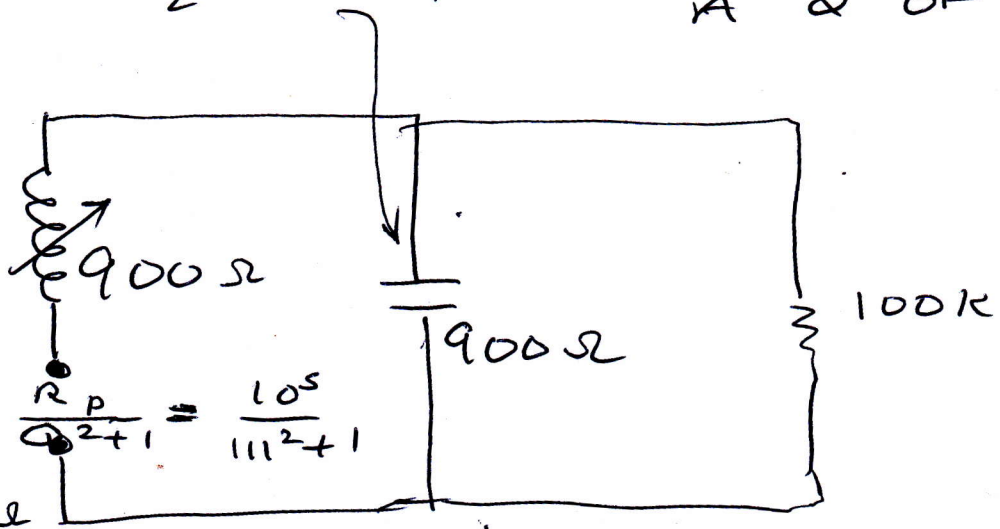
(2)



C_1 AND C_2' ADDED.

C_2' R_2' HAVE A Q OF 10.

(3)



$$R_S = \frac{R_P}{Q^2+1} = \frac{10^5}{111^2+1}$$

$$= 8.1\Omega$$

$$Q = \frac{100\,000}{900} = 111$$