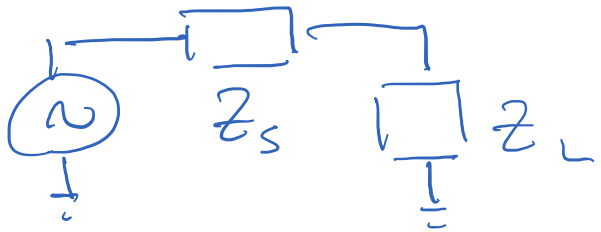
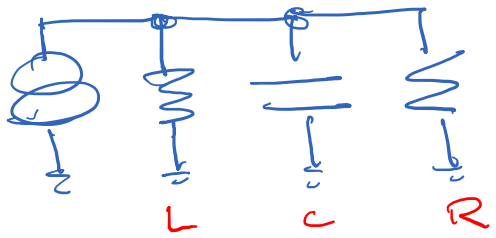
PROBLEM SET 2

1. CONSIDER A SOURCE WITH COMPLEX OUTPUT IMPEDANCE Z_S. FIND LOAD IMPEDANCE Z_L THAT PROVIDES MAXIMUM POWER TRANSFER FROM SOURCE TO LOAD.



2. LCR TANK CIRCUIT

$I_0 e^{j\omega t}$



INTRODUCE

$$\omega_0 \equiv \frac{1}{\sqrt{LC}}$$

$$Z_0 = \omega_0 L = \frac{1}{\omega_0 C} = \sqrt{\frac{L}{C}}$$

$$Q = R/Z_0 >> 1$$

$$\Delta = \omega - \omega_0$$

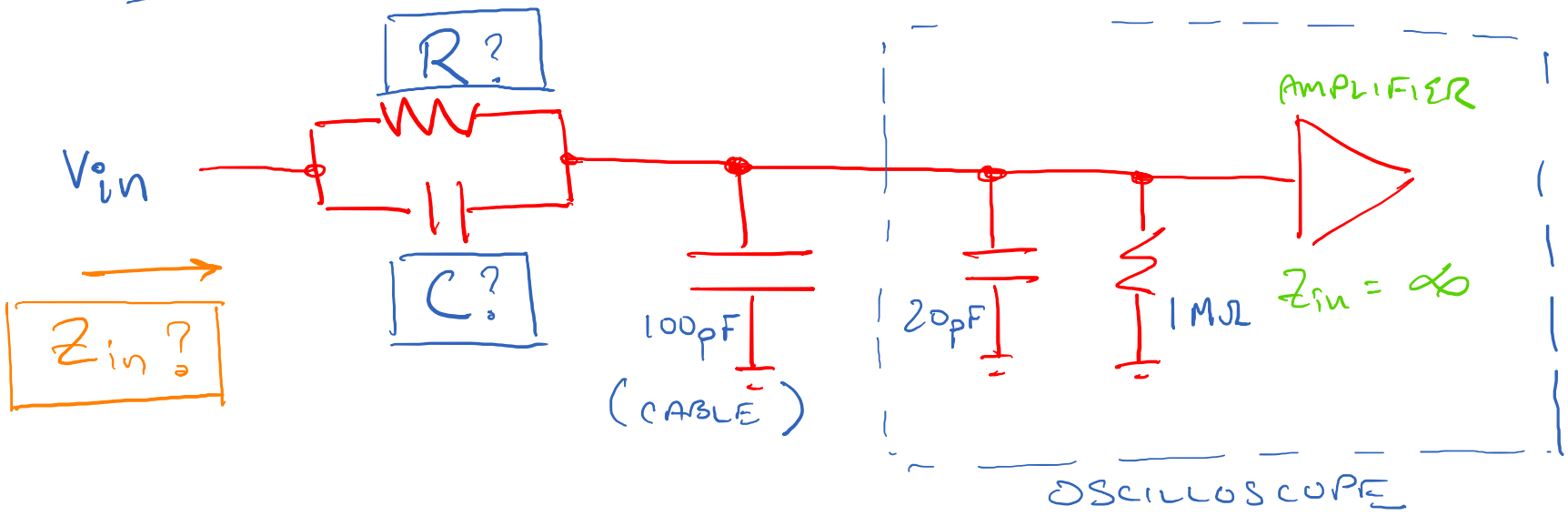
A. FIND $V_R(\Delta)$

B. FIND $I_L(\Delta = 0)$

C. FIND $I_C(\Delta = 0)$

EXPRESS ALL ANSWERS IN TERMS OF I_0, Z_0, Q, Δ.

3. HOROWITZ & HILL EXERCISE 1.44



A. FIND R & C SO ~~THAT~~ SIGNAL DELIVERED TO AMP INPUT IS Vin/10 @ ALL FREQUENCIES.

B. WHAT IS COMPLEX INPUT IMPEDANCE Zin?
[CAN EXPRESS AS A RESISTANCE IN PARALLEL W/ A CAPACITANCE]