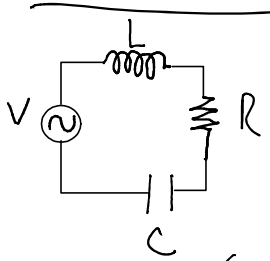
Lab 6 - Board Notes - RLC Circuit

Tuesday, May 27, 2014 12:03 PM

LAB 6 - LRC CIRCUITS



LINEAR FREQ $f = \frac{1}{T}$; ANGULAR FREQ $\omega = 2\pi f$

WHERE T IN SECONDS

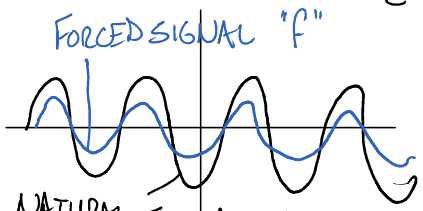
THEORY RES. FREQ: $\omega_{RES} = \frac{1}{\sqrt{LC}}$

IMPEDANCE $V = IR \Rightarrow V = IZ$

WHERE $Z = \sqrt{(X_L - X_C)^2 + R^2}$

→ INDUCTIVE REACTANCE $X_L = \omega L$

→ CAPACITIVE REACTANCE $X_C = 1/\omega C$



AT RESONANCE:

WHEN $X_L = X_C \rightarrow Z = R$

NOTE: NOT ALWAYS THE CASE

EXPERIMENT:

POWER AMP: 2.97V SINE WAVE @ 10Hz

SCOPE: OUTPUT VOLTAGE VS. VOLTAGE SENSOR (5000Hz)

IRON CORE INSIDE INDUCTOR

NOTE: VOLTAGE SENSOR AROUND RESISTOR NOT INDUCTOR

REPORT

- COVERSHEET
- QUESTIONS
- TABLES
- PLOT
  - → CURRENT $\left(\frac{V_R}{R}\right)$ VS. LINEAR FREQ (f) [VALUES FROM DATA TABLE]
  - → V_R VS LINEAR FREQ
  - → VOLTAGE VS TIME AT RESONANCE
    - → 1 PERIOD