ECE2150J 2025FA Assignment 6

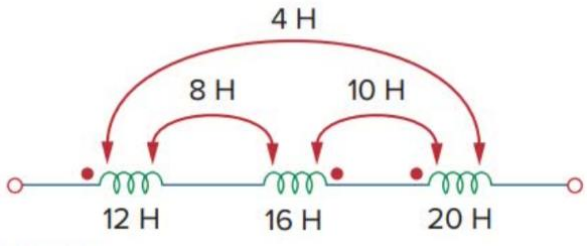
GLOBAL COLLEGE
SHANGHAI JIAO TONG UNIVERSITY

Due Date: 23:59 December 20th

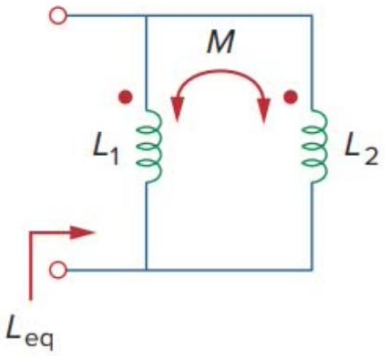
In order to get full marks, you shall write all the intermediate steps of calculation or proof unless otherwise indicated.

Exercise 6.1 (25%)

(a) Find the total inductance for the three coupled coils.



(b) Find the equivalent inductance L_{eq}.



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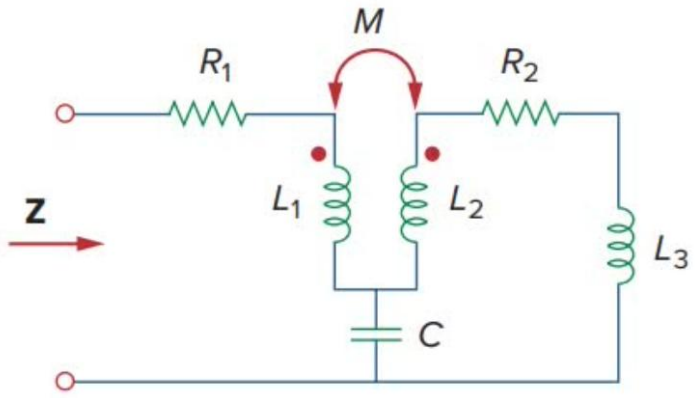
Exercise 6.2 (25%)

$R1 = R2 = 5\text{k}\Omega, M = 20$ H, $L1 = 10$H, $L_2 = 5$H, $L_3 = 10$ H, $C = 0.1$ F. Suppose frequency of source is $\omega = 10$k rad/s. Find the equivalent impedance Z. All currents flow clockwise.



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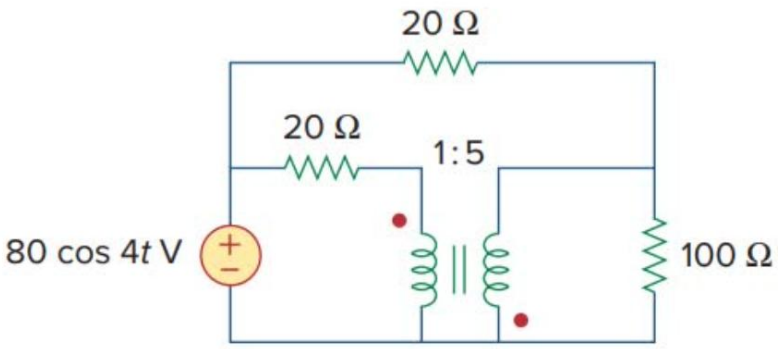
Exercise 6.3 (25%)

Determine the average power absorbed by each resistor in this circuit. All currents flow clockwise.



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Exercise 6.4 (25%)

M = 0.2 H, v_s = 12 cos 10t V.

Find i_1 and i_2. Calculate the energy stored in the coupled coils at t = 15ms.