Name:	Roll No.	Tutorial Group:

Problem: Assume that there is no mutual inductance between L_x, L_y, and L_z.

(a) If the networks of Fig. 1(a) and 1(b) are equivalent, specify values for L_x, L_y, and L_z.

(b) Repeat if the dot on the secondary in Fig. 1(b) is located at the bottom of the coil.
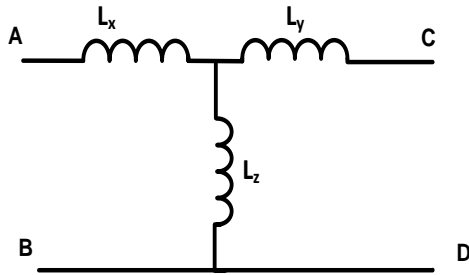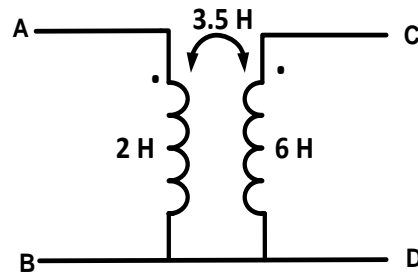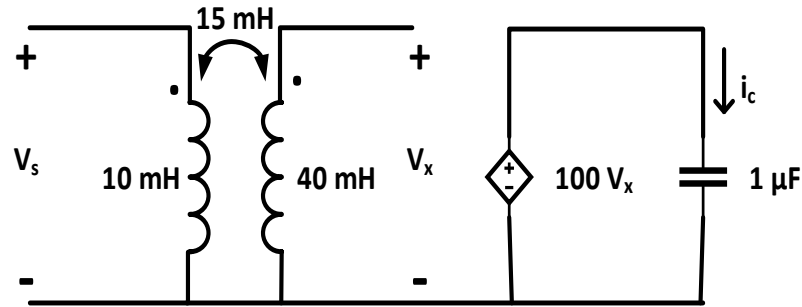
Fig. 1(a)

Fig. 1(b)

TUTORIAL-11: PROBLEMS

Problem-1: Find $i_c(t)$ for t>0 in the circuit given below, if $v_s(t) = 10t^2u(t) / (t^2+0.01)$ V.

Problem-2: A series resonant network consists of a 50Ω resistor, a $4mH$ inductor and a $0.1\mu F$ capacitor. Find (a) Z_{in} at $\omega = 45$ krad/s, (b) the ratio of magnitudes of capacitor impedance to resistor at $\omega = 45krad/s$ and (c) Find the value of ω in rad/s and frequency f in Hz at which the current will be maximum.

Problem-3: Given the decimal arithmetic expression $f(x) = 3x+2$ for $0 \le x \le 7$. Where $f(x)$ and x are expressed in binary. Implement $f(x)$ using decoder.

Problem-4: A shifter is a combinational network capable of shifting of 0's and 1's to the left or right, leaving vacancies, by a fixed number of places as a result of control signal. For example, assuming vacated positions are replaced by 0's, the string 0011 when shifting right by 1 position becomes 0001 and when shifting left by one-bit position becomes 0110. A Shifter to handle an n-bit string can be readily designed with n multiplexers. Bits from the string are applied to the data input lines. The control signal for various actions are applied to the select input lines. The shifted string appears on the output lines. Design a shifter for handling a 4-bit string where table indicates the control signals and desired action.

S_1	S_0	Action
0	0	Pass input string to output
0	1	Shift right 1 bit position
1	0	Shift right 2 bit positions
1	1	Shift left 1 bit position