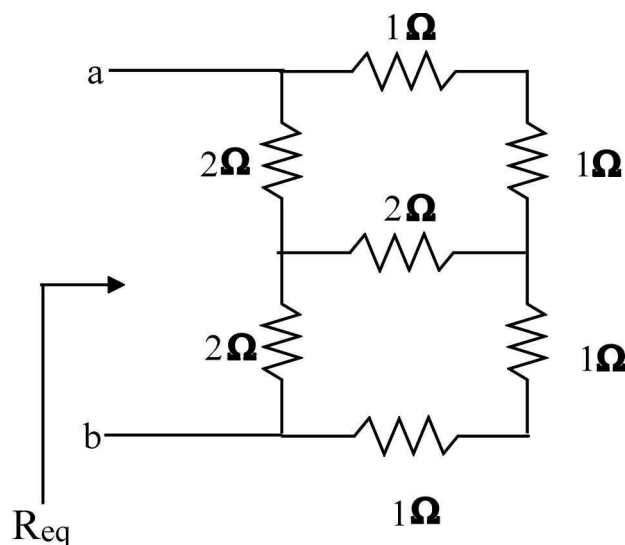


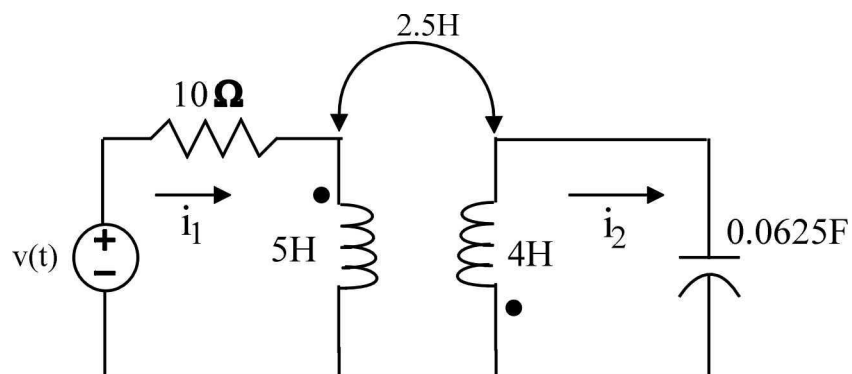
1. Find the equivalent resistance  $R_{eq}$  at the terminals a-b. (20%)



2. For the following circuit,  $v(t) = 60\cos(4t + 30^\circ) V$ ,

2.1. Determine the coupling coefficient. (4%)

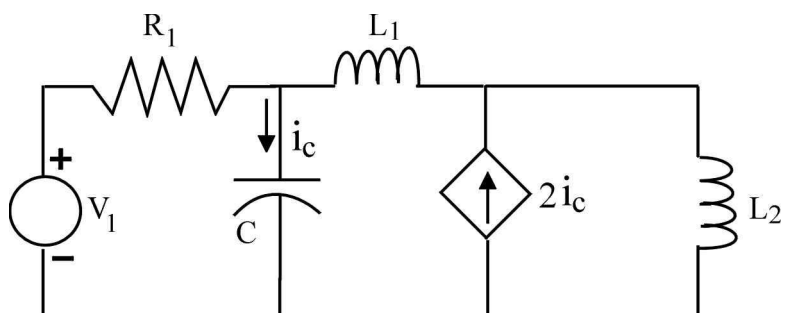
2.2. Calculate the currents,  $i_1(t)$  and  $i_2(t)$ . (16%)



3. The parameter values for the following circuit are:

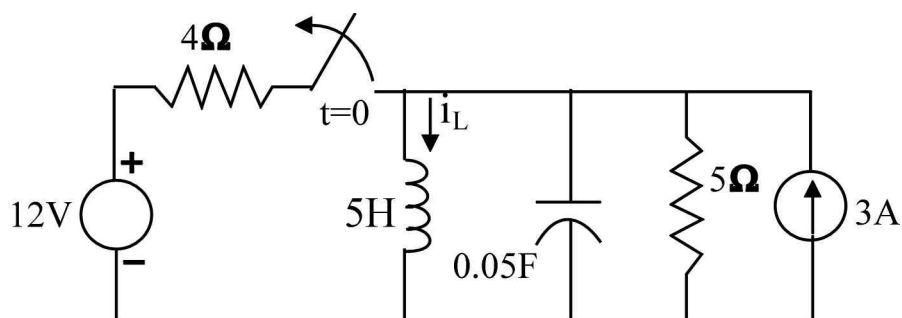
$$R_1 = 10\Omega, \quad C = 0.1F, \quad L_1 = 1H, \quad L_2 = 0.5H$$

And the voltage source  $V_1 = 20\cos 4t \text{ V}$ , Find the current  $i_c(t)$  (20%)



4. The switch has been closed for a long time before  $t = 0$ , and is opened at  $t = 0$ .

Determine the current  $i_L(t)$  for  $t > 0$ . (20%)



5. For a circuit with transfer function

$$H(s) = \frac{(s+3)(s+5)}{s(s^2+4s+5)}$$

5.1. Find the impulse response for this circuit. (10%)

5.2. Find the output if the input is  $6te^{-2t}u(t)$ . (10%)