HUST
School of Electrical Engineering

FINAL EXAMINATION: **LINEAR CIRCUIT 2**
Duration of the exam: ***90 minutes***

Signature of Lecturer

Sheet num. 01
7/2020

Signature of Department Leader

(*Documents are allowed to use. Return the question sheet*)

Student's name:..... **Student Code:** .....

Question 1 (3 pts)

A given circuit in figure 1: All sources have the same frequency.

a. Write a set of equation by using mesh analysis (the direction of the mesh currents is given)?

b. Express the branch currents with given direction in term of the mesh currents.

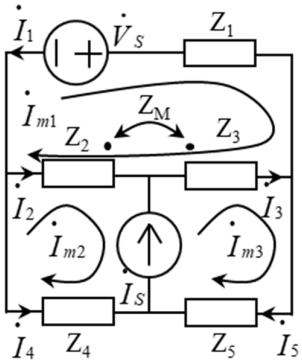

Figure 1

Question 2 (3 pts)

A given circuit in figure 2, where: $R = 50\Omega, R_L = 25\Omega, L = 0{,}5H, C = 2.10^{-4}F, i_S(t) = 2\sqrt{2}\sin(100t)\,A, V_S = 60V(DC)$,

$the\ parameter\ Z = \begin{bmatrix} 20 & 10 \\ 10 & 30 \end{bmatrix}\Omega$.

a) Find the RMS value of $i_1(t)$

b) Find the average power supplied by each source and the average power delivered to the Z parameter.

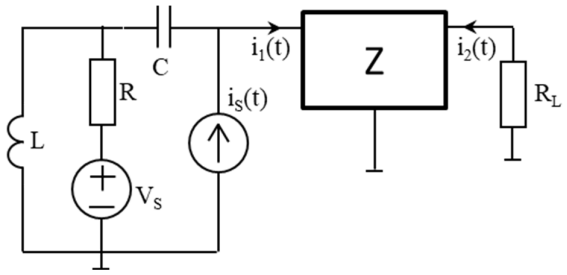

Figure 2

Question 3 (3 pts)

A given circuit in figure 3, where: $R_1 = 30\Omega$, $R_2 = 20\Omega, R_3 = 40\Omega \quad L_1 = 12H, L_2 = 6H, M = 8H, V_{S1} = 10V(DC), V_{S2} = 20V(DC)$.

Find the step response $i_2(t)$ when the switch K is opened at the time $t = 0$?

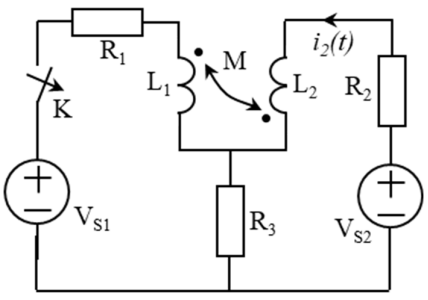

Figure 3

Note: Good representation: 1 pt