HUST
School of Electrical Engineering

FINAL EXAMINATION: **LINEAR CIRCUIT 2**
Duration of the exam: ***60 minutes***

Sheet num. 02

9/2021

(*Documents are allowed to use*)

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 nodal analysis?

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

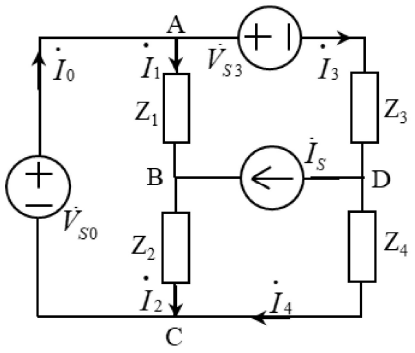

Figure 1

Question 2 (3 pts)

Circuit in Figure 2: $e_3(t) = 20\sqrt{2}\sin(10t + 45^0)V$;
$R_1 = 40\Omega$; $C_2 = 0{,}01F$; $j_6(t) = 2A$ (DC source);
$R_4 = 20\Omega$; $R_5 = 15\Omega$; $R_7 = 30\Omega$; $L_6 = 2H$. Find the average power on R_1.

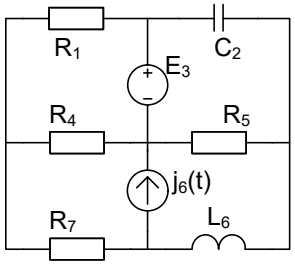

Figure 2

Question 3 (3 pts)

Given a circuit as in figure 3, where: $R_1 = 30\Omega$, $R_2 = 20\Omega$, $C = 0{,}2F$, $L = 1H$, $I_S = 2A$, $V_S = 10V$. Find the step response $i_L(t)$ when the switch is opened at the time $t = 0$? (Note that, when the switch is closed, the circuit is in steady state)

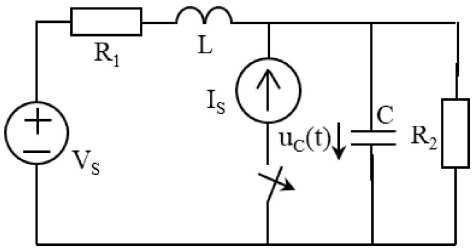

Figure 3

Note: Good representation: 1 pt