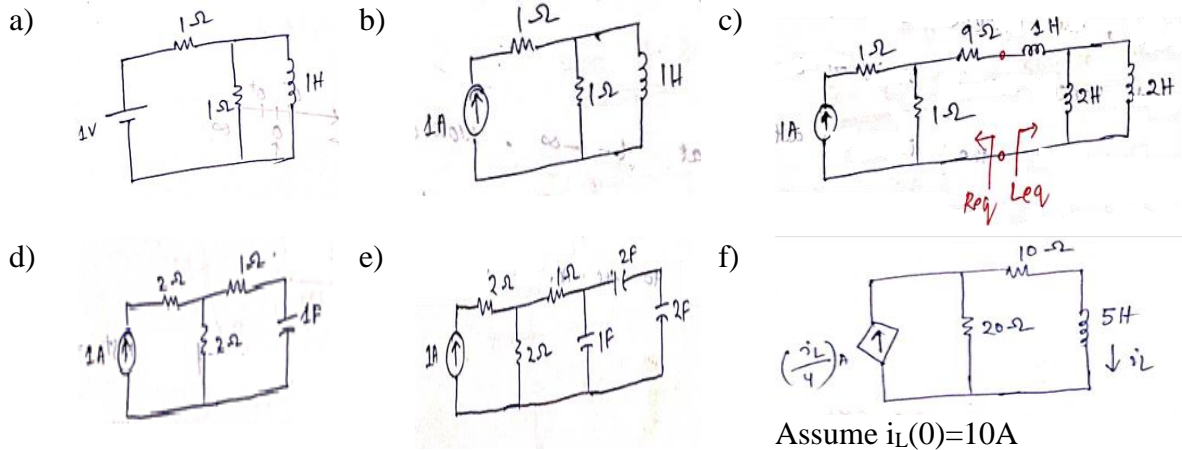


NETWORK THEORY (EC2001)

Assignment 1

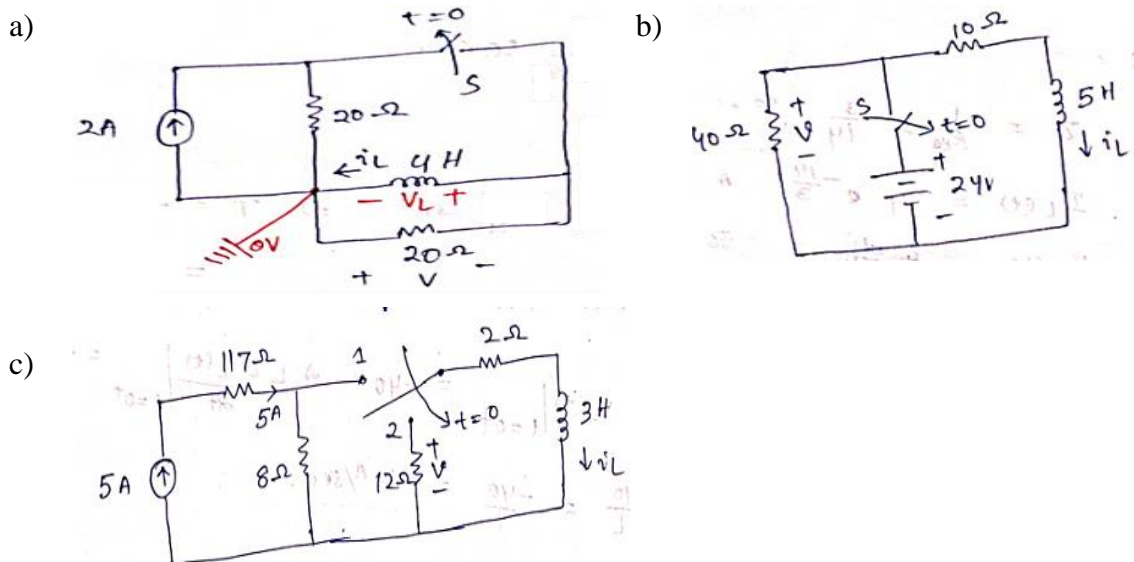
1. Problems on the Time Constant

Q.1 Determine the time constants of the following circuits



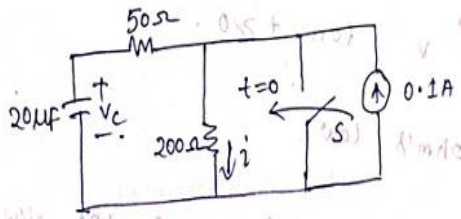
2. Problems on the Source Free Circuit

Q.2 Determine $i_L(0^+)$, $V(0^+)$, $i_L(t)$ for $t \geq 0$ for the following circuits. Consider the switch is closed for a long time and it is opened at $t = 0$ for each case.

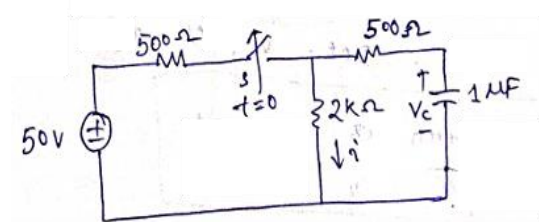


Q.3(i) Determine $V_C(0^+)$, $i(0^+)$, $V_C(t)$ for $t \geq 0$ for the following circuits. Consider the switch is opened for a long time and it is closed at $t = 0$ for each case.

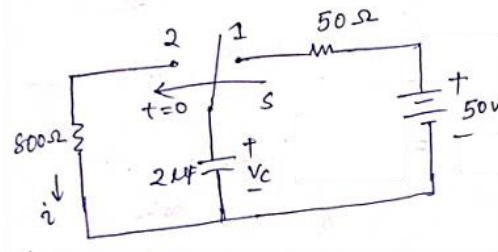
a)



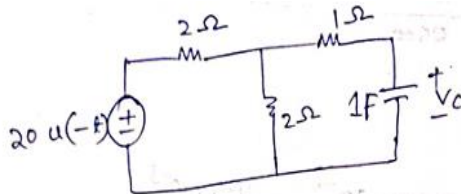
b)



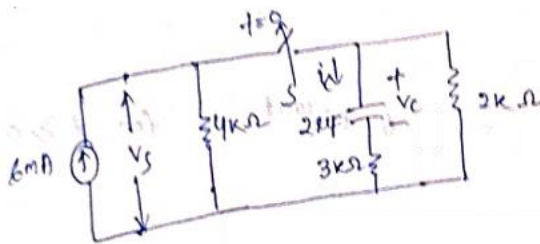
c)



Q.3(ii) Determine V_C and i_C for $t \geq 0$

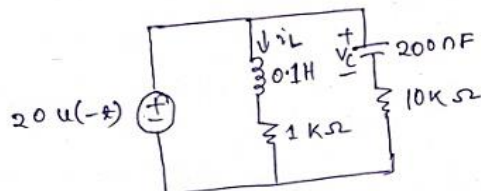


Q.4 Determine V_C , i_C , i_R , V_S for $t \geq 0$



Q.5 Determine V_C , i_L for $t \geq 0$

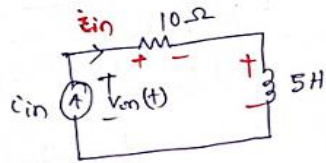
a)



b) In the above problem, if the excitation is $20u(-t)$ mA (\uparrow) then i_L and V_C for $t \geq 0$

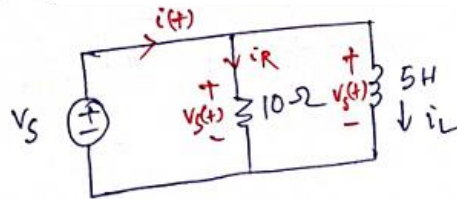
Q.6

gf $i_{in} = 0.4t^2$ A for $t \geq 0$ then $v_{in}(t) \big|_{t=1\text{sec}} = ?$

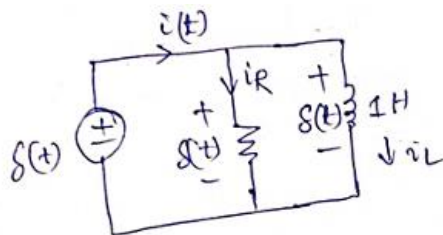


Q.7

gf $V_S(t) = 40V$ for $t \geq 0$ & $i_L(0) = 5A$, then $i(t) \big|_{t=2}$

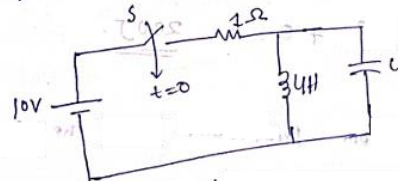


Q.8 Determine $i(t)$



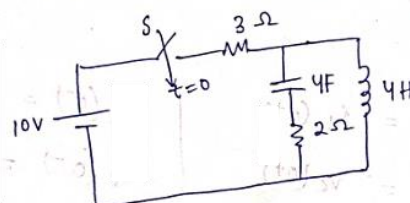
Q.9

Det. the current through the battery at $t = 0^+$ and at $t \rightarrow \infty$ constants.



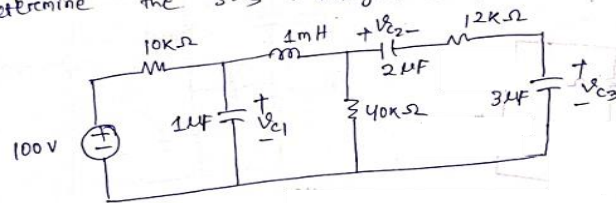
Q.10

Repeat the above Problem Procedure for the following n/w.



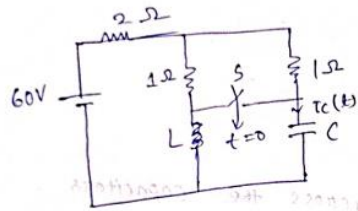
Q.11

Determine the s.s. voltages across the capacitors



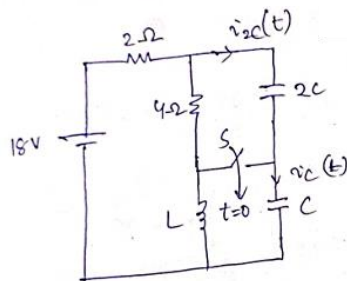
Q.12

Det. $i_c(0^+)$



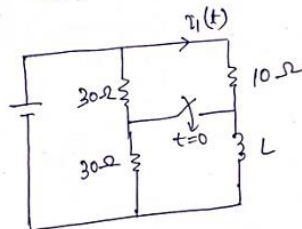
Q.13

Det. $i_{2c}(0^+)$ & $i_c(0^+)$

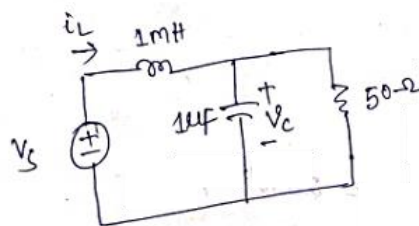


Q.14

Det. $i_1(0^+)$



Q.15 a)



If $v_s = 10 + 20u(t)$ then

$\frac{di_L(t)}{dt} \Big|_{t=0^+}$ & $\frac{dv_c(t)}{dt} \Big|_{t=0^+}$ are.

b)

Repeat the above problem procedure for the following n/w

