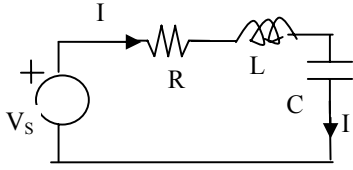


Diff Denklem		Ödev No		4
Adı Soyadı:				
Öğrenci No:				
	0	0	0	5
	1	1	0	0
	2	2	0	0
	3	3	0	0
	4	4	0	0
	5	5	0	0
	6	6	0	0
	7	7	0	0
	8	8	0	0
	9	9	0	0

Sekildeki devreye ait dif denklemler asagida verilmistir.

1)Bu dif denklemei elde edin.



$$\frac{d^2 V_c}{dt^2} + \frac{R}{L} \frac{dV_c}{dt} + \frac{1}{LC} V_c = V_s$$

2) R,L,C degerleri tablo 2 de verilmistir.

2a) $V_s=0$, $V_c(0)=10$, $I_L(0)=0$ degerleri icin devreyi cozun $V_c(t)$ ve $I_L(t)$ yi cizin.

2b) $V_s=10u(t)$, $V_c(0)=10V$, $I_L(0)=0$ degerleri icin devreyi cozun $V_c(t)$ ve $I_L(t)$ yi cizin.

2c) $V_s=10\sin(4t)$, $V_c(0)=0$, $I_L(0)=0$ degerleri icin devreyi cozun $V_c(t)$ ve $I_L(t)$ yi cizin.

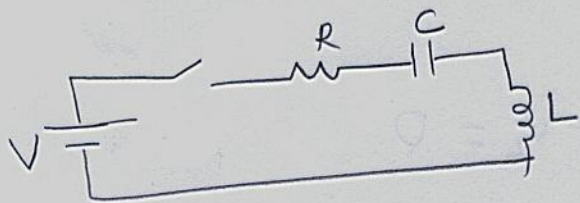
3) R,L,C degerleri tablo 3 de verilmistir.

3a) $V_s=0$, $V_c(0)=10$, $I_L(0)=0$ degerleri icin devreyi cozun $V_c(t)$ ve $I_L(t)$ yi cizin.

3b) $V_s=10u(t)$, $V_c(0)=0$, $I_L(0)=0$ degerleri icin devreyi cozun $V_c(t)$ ve $I_L(t)$ yi cizin.

3c) $V_s=10\sin(4t)$, $V_c(0)=0$, $I_L(0)=0$ degerleri icin devreyi cozun $V_c(t)$ ve $I_L(t)$ yi cizin.

3) Obtain differential equations for the following system



$$-V + RI + V_C + V_L = 0$$

$$i = C \frac{dV_C}{dt} \quad \frac{di}{dt} = C \frac{d^2 V_C}{dt^2} \quad V_L = L \frac{di}{dt} = LC \frac{d^2 V_C}{dt^2}$$

$$-V + R \left(C \frac{dV_C}{dt} \right) + V_C + LC \frac{d^2 V_C}{dt^2} = 0$$

$$LC \frac{d^2 V_C}{dt^2} + RC \frac{dV_C}{dt} + V_C = V$$

$$\boxed{\frac{d^2 V_C}{dt^2} + \frac{R}{L} \frac{dV_C}{dt} + \frac{1}{LC} V_C = \frac{V}{LC}}$$

if V is constant

$$i = C \frac{dV_C}{dt}$$

$$-\frac{dV}{dt} + R \frac{di}{dt} + \frac{dV_C}{dt} + \frac{dV_L}{dt} = 0$$

$$V_L = L \frac{di}{dt}$$

$$0 + R \frac{di}{dt} + \frac{i}{C} + L \frac{d^2 i}{dt^2} = 0$$

$$\boxed{\frac{d^2 i}{dt^2} + \frac{R}{L} \frac{di}{dt} + \frac{1}{LC} i = 0}$$