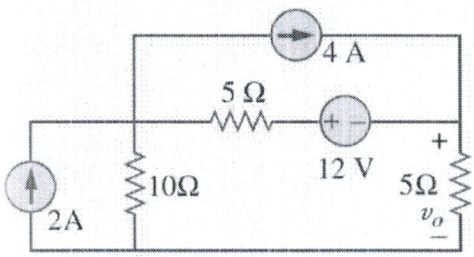
Adı Soyadı:
Öğrenci No:

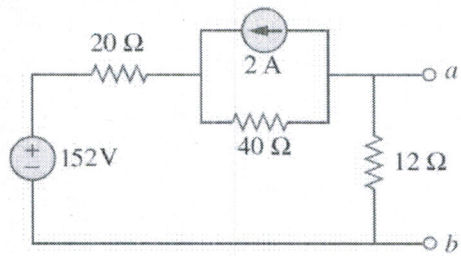
Kütahya Dumlupınar Üniversitesi
Mühendislik Fakültesi
Bilgisayar Mühendisliği Bölümü
Devre Teorileri Dersi Bütünleme Soruları (Sınav Süresi 65 dk)

06.01.2020
15:30

1) Vo gerilimini süperpozisyon teoremini kullanarak bulunuz. 35

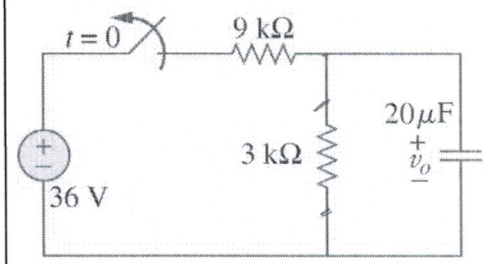


2) ab noktasından bakıldığında görünen Thevenin eşdeğer devresini bulunuz. (Bir kaynak dönüşümü yapmanız yararınıza olacaktır) 25

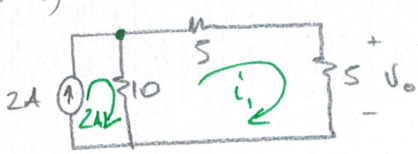


3) t=0 anında uzun süredir kapalı olan anahtar açılmaktadır. t>0 için v_o bulunuz.

30



C-1) i)



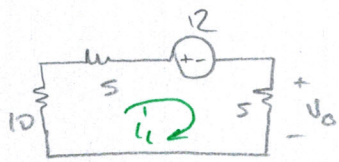
$10(i_1-2)+5i_1+5i_1=0$

$20i_1=20$

$i_1=1\,A$

$V_{o_1}=5.i_1=5V$ (10)

ii)



$10i_1+5i_1+12+5i_1=0$

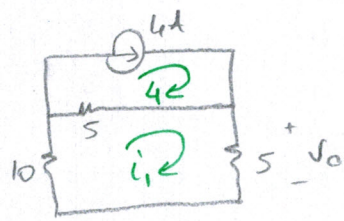
$20i_1=-12$

$i_1=-0,6\,A$

$V_{o_2}=5.i_1$

$=5(-0,6)=-3V$ (10)

iii)



$10i_1+5(i_1-4)+5i_1=0$

$20i_1=20$

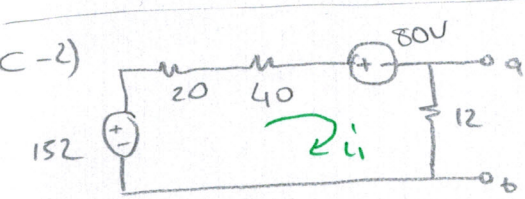
$i_1=1\,A$

$V_{o_3}=5.i_1$

$=5.1=5V$ (10)

$V_o=V_{o_1}+V_{o_2}+V_{o_3}=5-3+5=7V$ (5)

C-2)

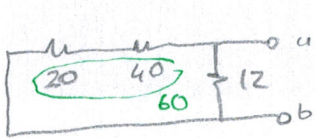


$-152+20i_1+40i_1+80+12i_1=0$

$72i_1=72$

$i_1=1\,A$ (10)

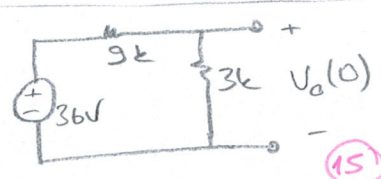
$V_{ab}=V_{Th}=12.i_1=12V$ (8)



$R_{Th}=R_{ab}=60\,//\,12$

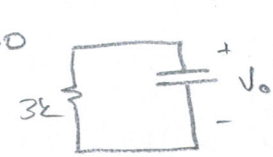
$=\frac{60.12}{72}=10\Omega$ (17)

C-3). $t<0$



$V_o(0)=\frac{36}{9k+3k}.3k=9V$ (15)

$t>0$



$\tau=RC=3.10^3.20.10^{-6}$

$=0,06s$ (7)

$V_o(t)=V_o(0).e^{-t/\tau}=9.e^{-t/0,06}\,V$ (8)