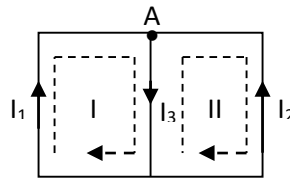
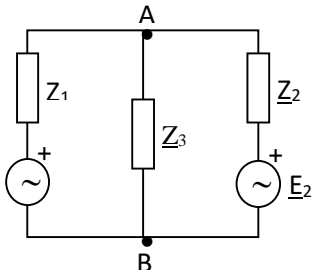


Koristeći metodu Kirhofovih pravila odrediti struje

po granama, prema slici , ako je dato:

$$E_1 = 100 \text{ V}; E_2 = j100 \text{ V}; Z_1 = -j2 \Omega; Z_2 = j5 \Omega \text{ i } Z_3 = 5 \Omega.$$



Proizvoljno usvojeni  
smerovi struja i kontura

$$\text{čvor A: } I_1 = I_2 + I_3 \dots\dots\dots ( 1 )$$

$$\text{kontura I: } E_1 - Z_1 I_1 - Z_3 I_3 = 0 \dots\dots\dots ( 2 )$$

$$\text{kontura II: } -Z_2 I_2 - E_2 + Z_3 I_3 = 0 \dots\dots\dots ( 3 )$$

zamenimo vrednosti u jednačini 2 i 3

$$100 - (-j2)I_1 - 5I_3 = 0$$

$$-j5I_2 - j100 + 5I_3 = 0$$

$$100 + j2(I_2 + I_3) - 5I_3 = 0$$

$$-j5I_2 - j100 + 5I_3 = 0$$

$$j2I_2 + j2I_3 - 5I_3 = -100 \rightarrow j2I_2 = -100 - j2I_3 + 5I_3 \rightarrow I_2 = [-100 + (5 - j2)I_3] / j2$$

zamenimo struju  $I_2$

$$-j5I_2 + 5I_3 = j100 \rightarrow -j5 \frac{[-100 + (5 - j2)I_3]}{j2} + 5I_3 = j100 \rightarrow -2.5[-100 + (5 - j2)I_3] + 5I_3 =$$

$$= j100 \rightarrow 250 - 12.5I_3 + j5I_3 + 5I_3 = j100$$

$$250 - 7.5I_3 + j5I_3 = j100 \rightarrow -7.5I_3 + j5I_3 = j100 - 250 \rightarrow (-7.5 + j5)I_3 = j100 - 250$$

$$-(7.5 - j5)I_3 = j100 - 250 / -1$$

$$(7.5-j5)I_3=250-j100 \rightarrow I_3=\frac{250-j100}{7.5-j5}=\frac{100-j40}{3-j2}=\frac{100-j40}{3-j2}*\frac{3+j2}{3+j2}=\frac{300+j200-j120+80}{9+j6-j6+4}=\frac{380+j80}{13}=29.3+j6.15$$

$I_3=29.3+j6.15$  a znamo da je  $I_2=[-100+(5-j2)I_3]/j2$  pa sledi

$$I_2=\frac{-100+5jI_3-j2I_3}{j2}=\frac{-100-j2(29.3+j6.15)+5(29.3+j6.15)}{j2} =$$

$$\frac{-100-j58.6+13.3+146.5+j30.75}{j2}=\frac{59.8-j27.9}{j2}=\frac{59.8}{j2}-\frac{j27.9}{j2}=-j29.9-13.95$$

$I_2=-(13.95+j29.9)$ A i konačno

$$I_1=I_2+I_3=-13.95-j29.9+29.3+j6.15=$$

$$I_1=(15.35-j23.75)$$
A

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