

OLIY TA'LIM TIZIMI PEDAGOG VA RAHBAR KADRLARNI QAYTA TAYYORLASH VA ULARNING MALAKASINI OSHIRISHNI TASHKIL ETISH BOSH ILMİY-METODİK MARKAZI

“Toshkent Irrigatsiya va qishloq xo'jaligini mexanizatsiyalash muhandislari
instituti” Milliy tadqiqot universiteti, “Elektrotexnika va Mexatronika”
kafedrasи mudiri, texnika fanlari nomzodi, dotsent

Baratov Rustam Jalilovichning

**“Elektr zanjirlarini analiz va sintez qilishda
SIMULINK dan foydalanish” mavzusidagi**

MAHORAT DARSI

Ma'ruzaning maqsadi:

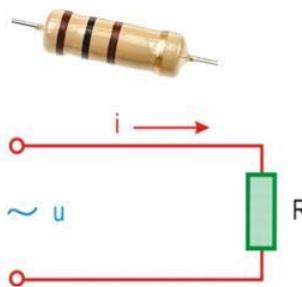
Elektr jihozlarining zanjirlarini analiz va sintez qilishda zamonaviy programma vositalaridan foydalanish bo'yicha amaliy ko'nigmaga ega bo'lishdan iborat

Ma'ruzani tinglagandan keyin tinglovchilar quyidagi bilimga ega bo'ladi :

- ❖ elektr zanjiri elementlarida ro'y beradigan fizik jarayonni tog'ri tasavvur qila olish;
- ❖ murakkab elektr va elektron qurilmalar zanjirlarini analiz va sintez qilsh hamda modellashtira olish;
- ❖ har qanday murakkab elektr va elektron zanjirlarni loyihalashda kompyuter texnologiyalaridan foydalana olish bo'yicha bilimga ega bo'ladi.

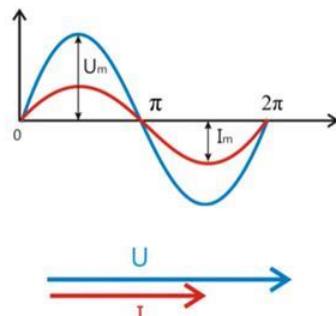
Elektr zanjirining asosiy elementlari :

Aktiv qarshilik (R)

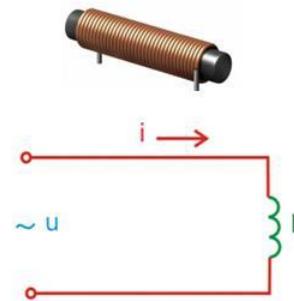


$$u = U_m \sin \omega t$$

$$i = \frac{u}{R} = \frac{U_m \sin \omega t}{R} = I_m \sin \omega t$$

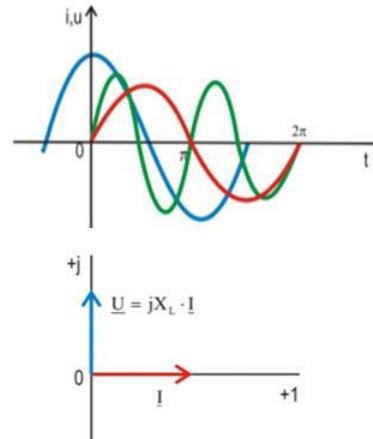


Induktiv g'altak (L)

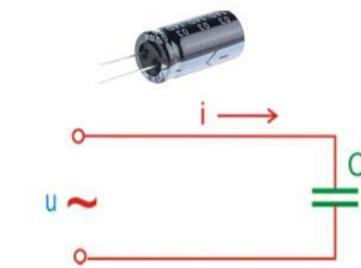


$$i = I_m \sin \omega t$$

$$u_L = L \frac{di}{dt} = L \frac{d(I_m \sin \omega t)}{dt} = \omega L \cdot I_m \cos \omega t = U_m \sin(\omega t + \frac{\pi}{2})$$



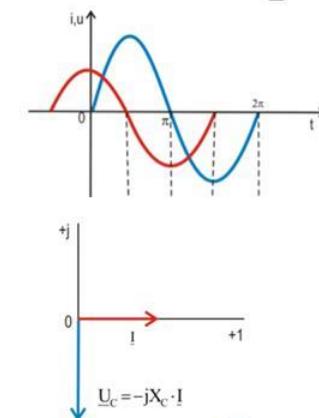
Sig'im elementi (C)



$$u = U_m \sin \omega t$$

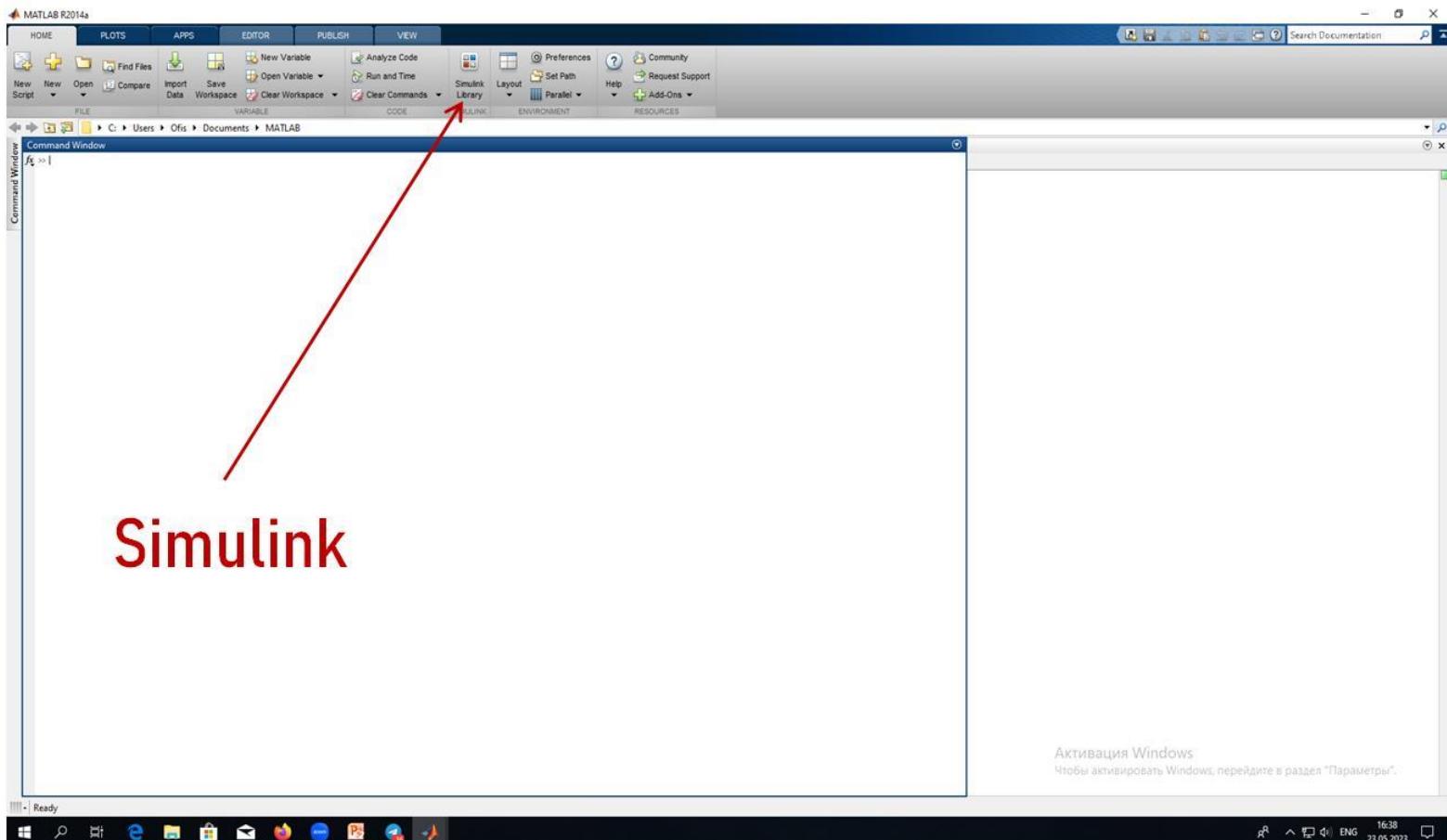
$$i = C \frac{du}{dt} = \omega C \cdot U_m \cos \omega t$$

$$i = I_m \sin(\omega t + \frac{\pi}{2})$$



Elektr zanjirini SIMULINKda modellashtirish : (1)

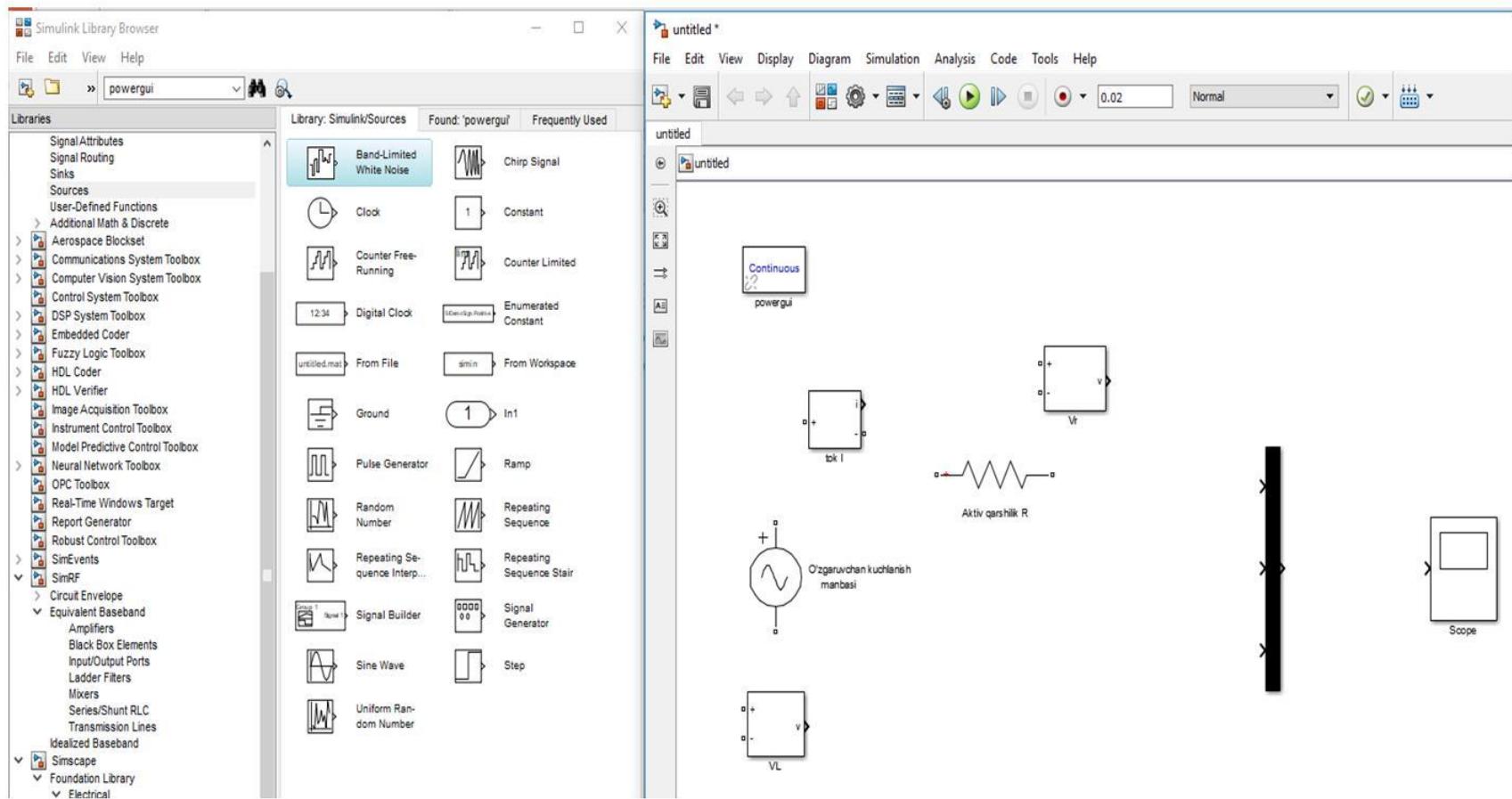
- Aktiv qarshilikka ega (R) zanjir analizi



Simulink

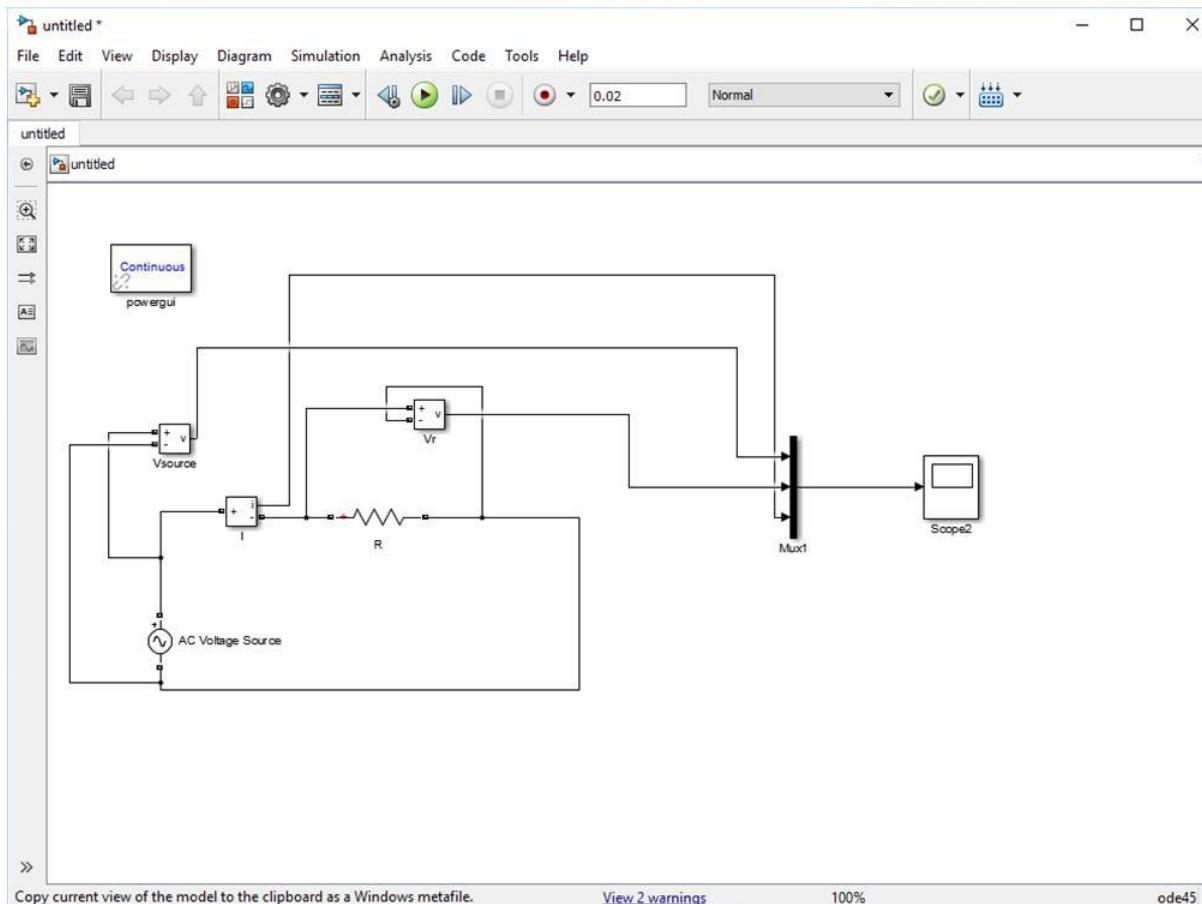
Elektr zanjirini SIMULINKda modellashtirish : (2)

■ Aktiv qarshilikka ega (R) zanjir analizi



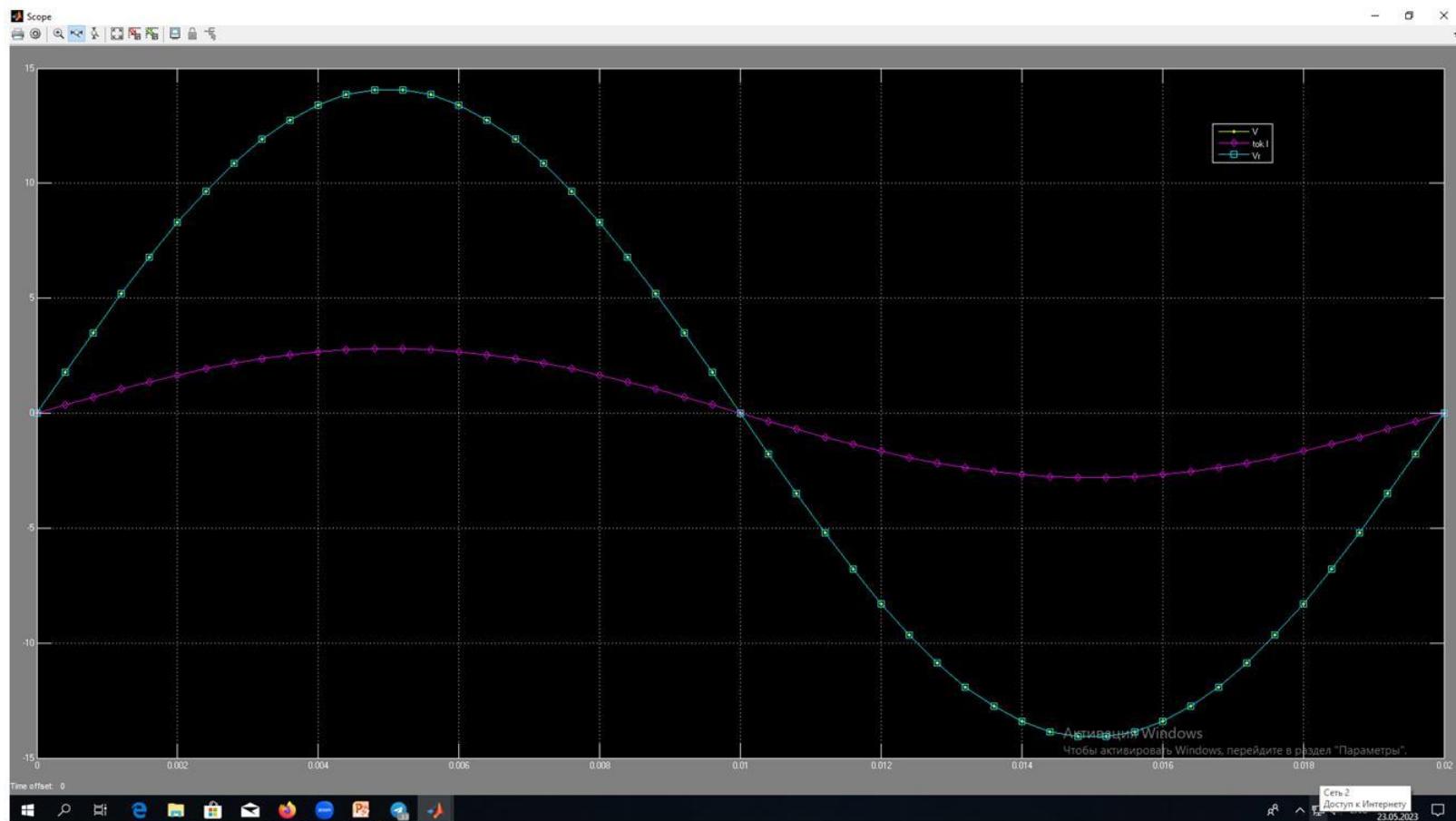
Elektr zanjirini SIMULINKda modellashtirish : (3)

■ Aktiv qarshilikka ega (R) zanjir analizi



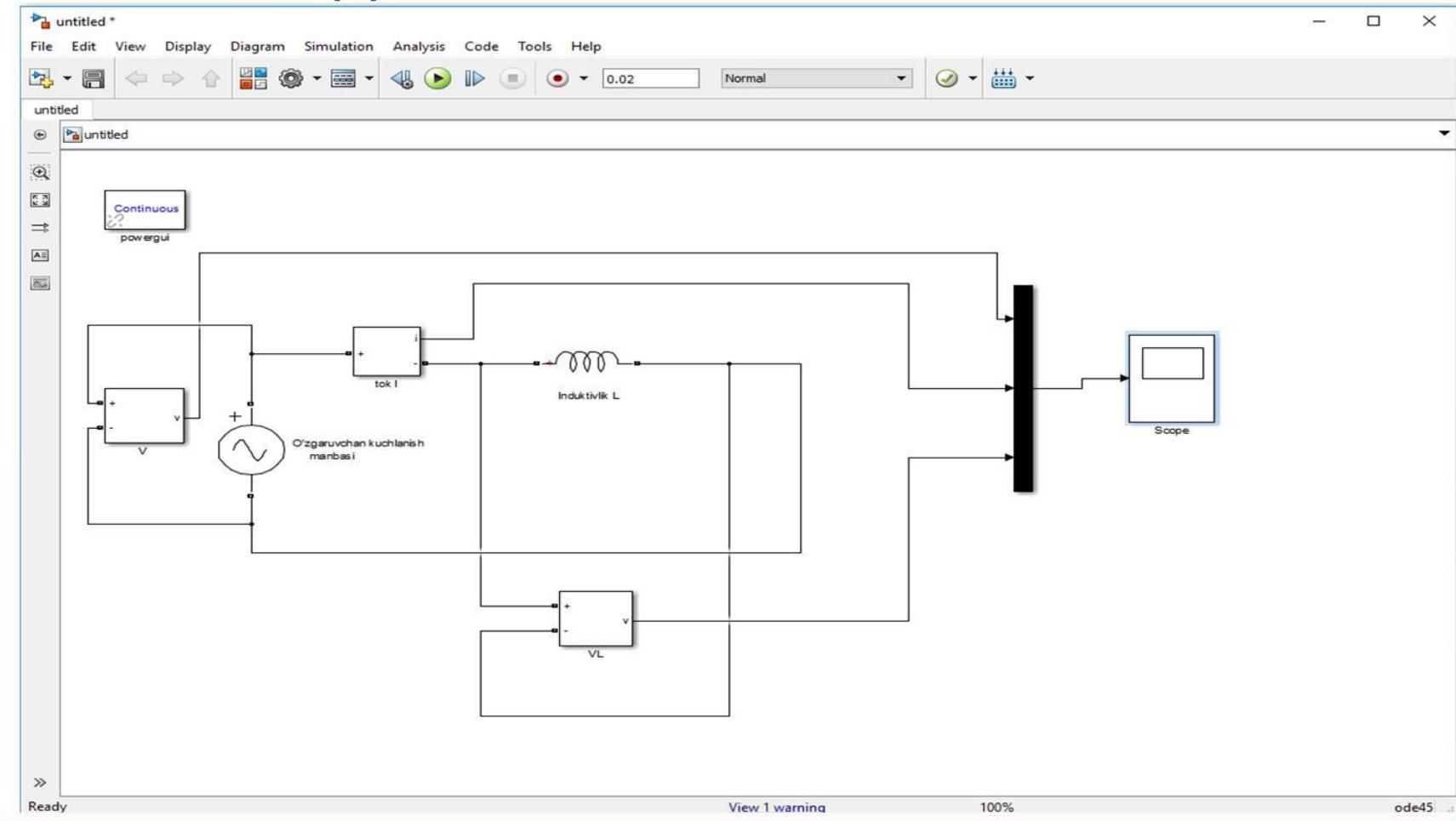
Elektr zanjirini SIMULINKda modellashtirish : (4)

■ Aktiv qarshilik (R)



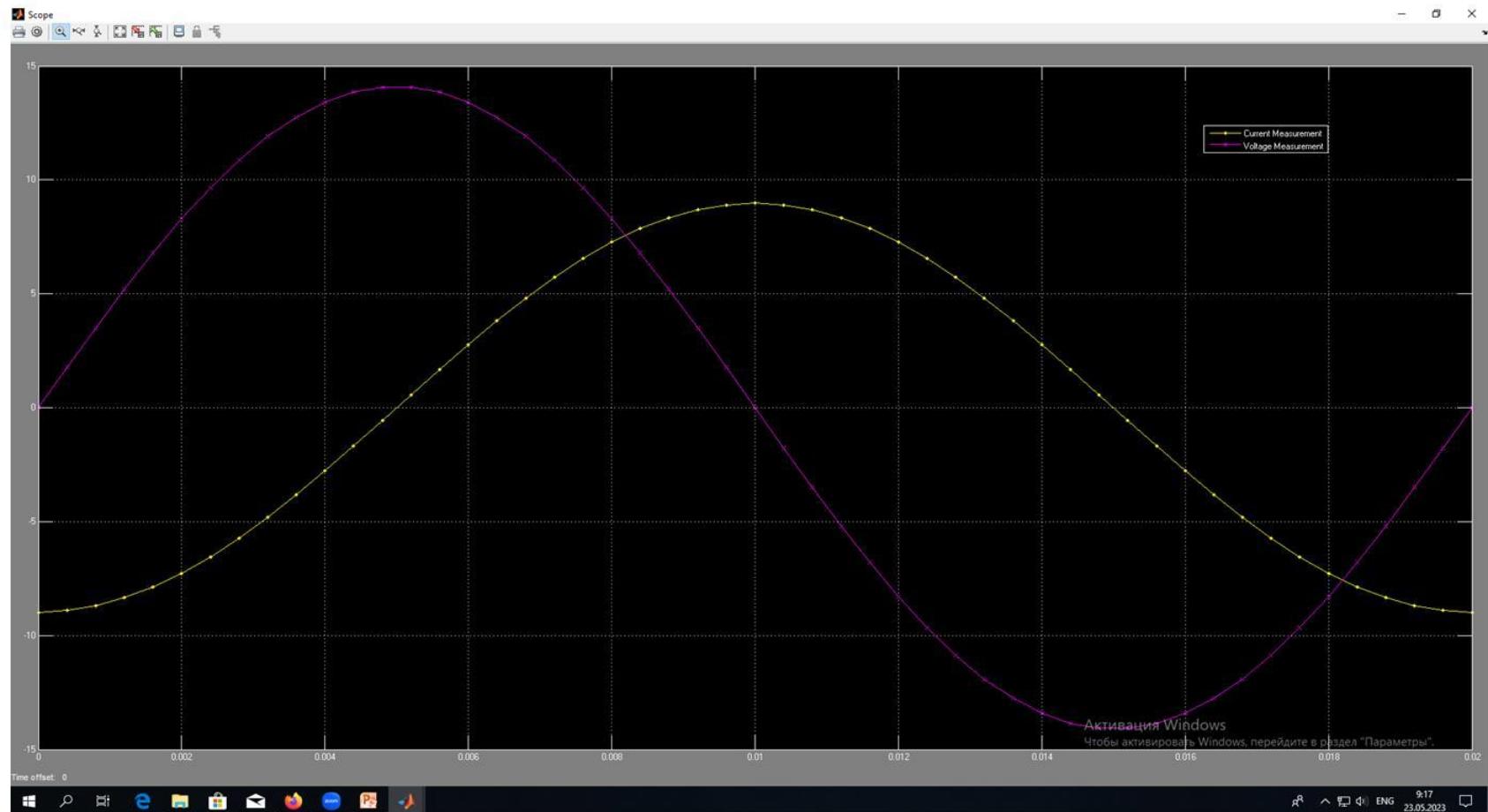
Elektr zanjirini SIMULINKda modellashtirish : (5)

■ Induktivlik (L)



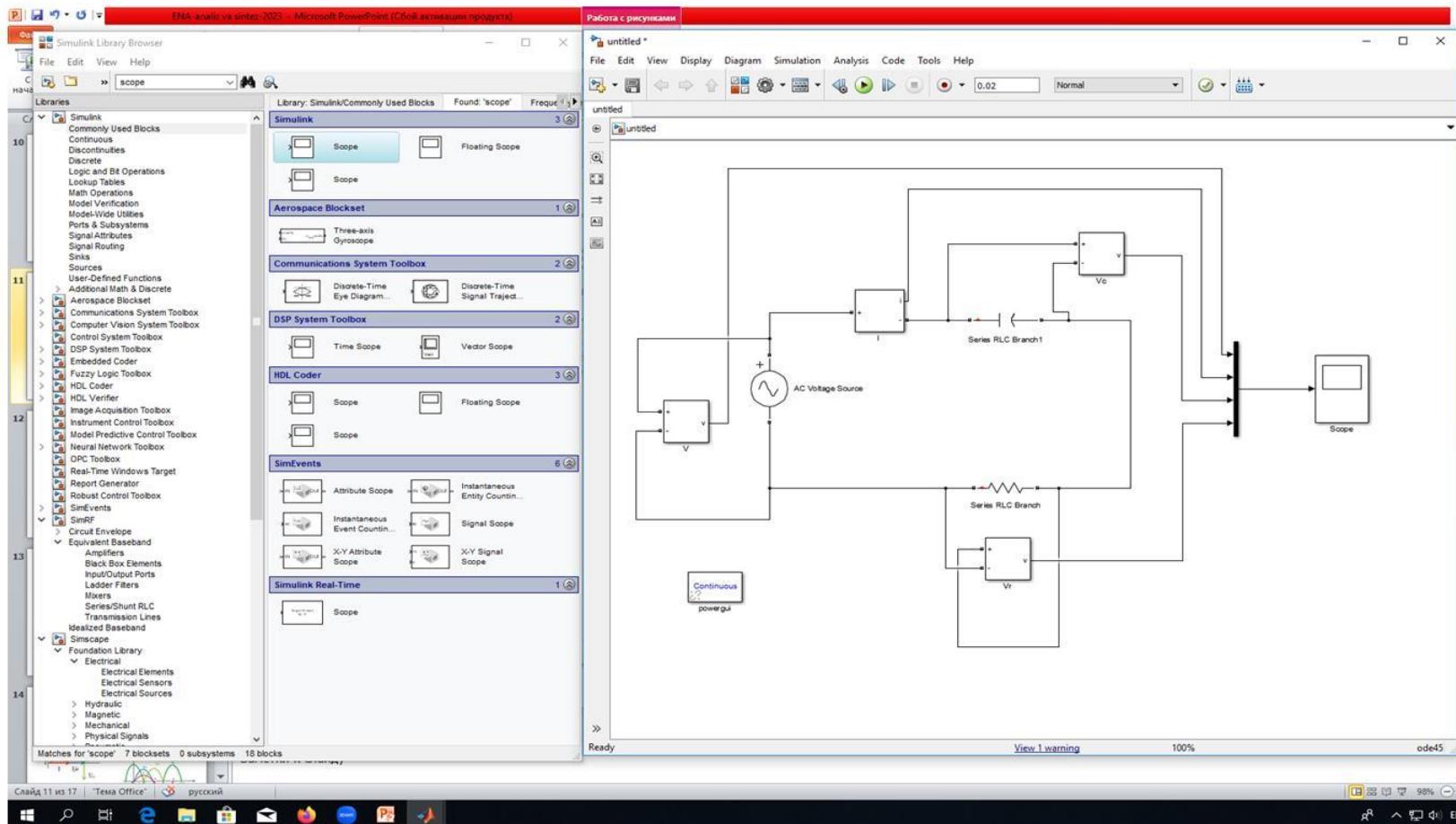
Elektr zanjirini SIMULINKda modellashtirish : (6)

■ Induktivlik (L)



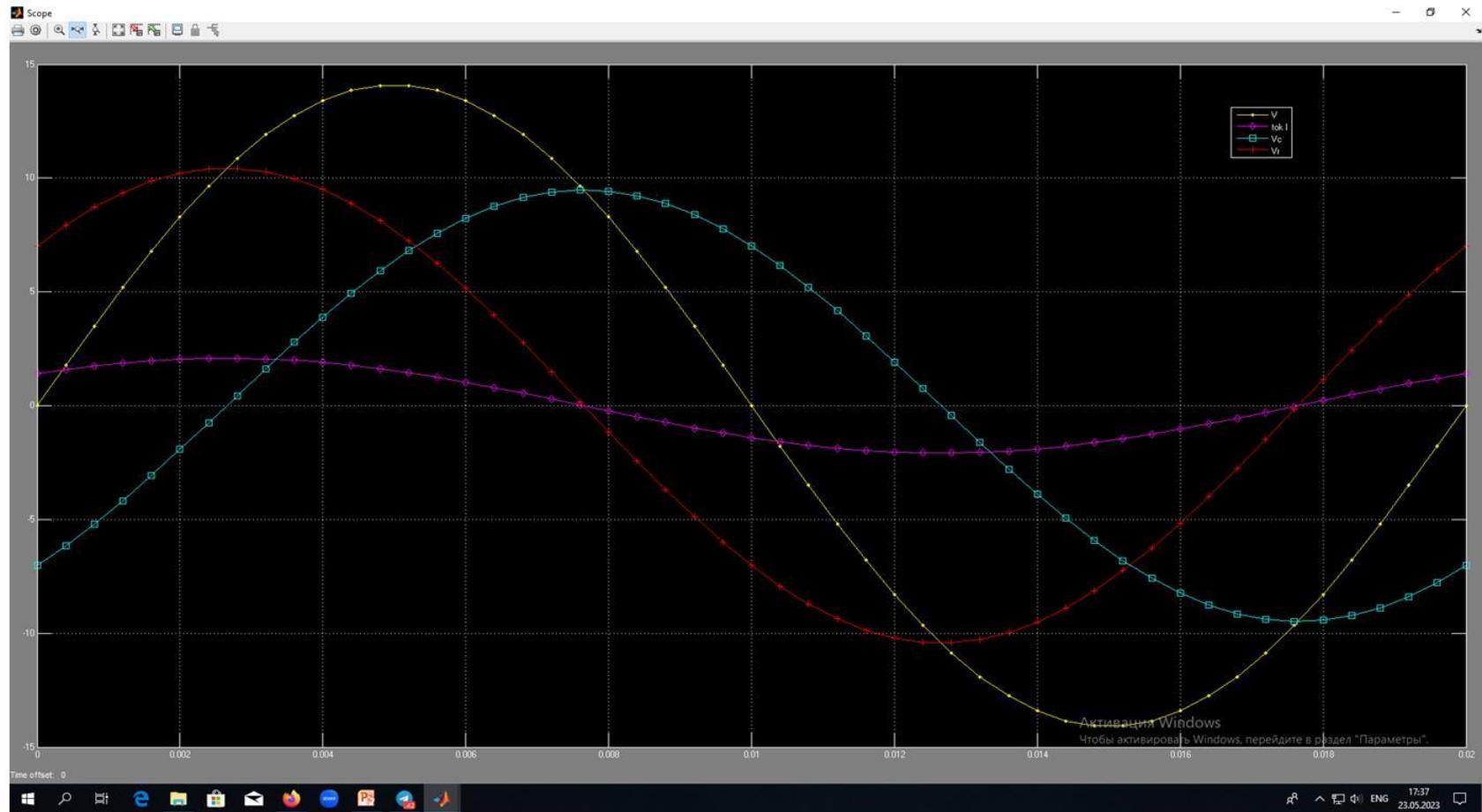
Elektr zanjirini SIMULINKda modellashtirish : (7)

■ Sig'im elementi (C)



Elektr zanjirini SIMULINKda modellashtirish : (7)

■ Sig'im elementi (C)



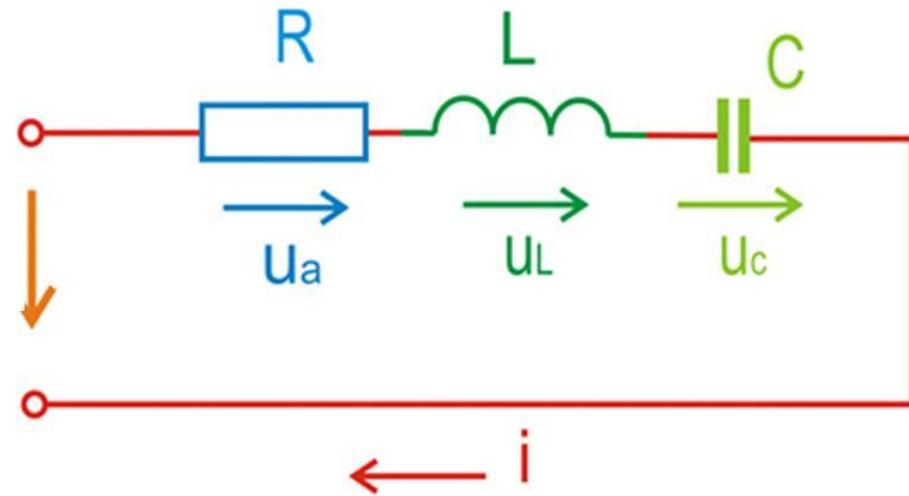
Elektr zanjirini sintez qilish : (1)

$$i = I_m \sin \omega t$$

$$u_a = R \cdot I_m \sin \omega t = U_{a,m} \sin \omega t$$

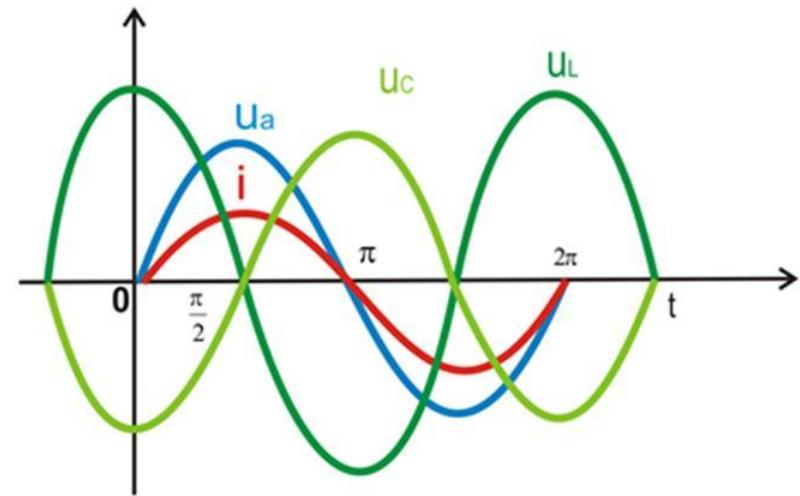
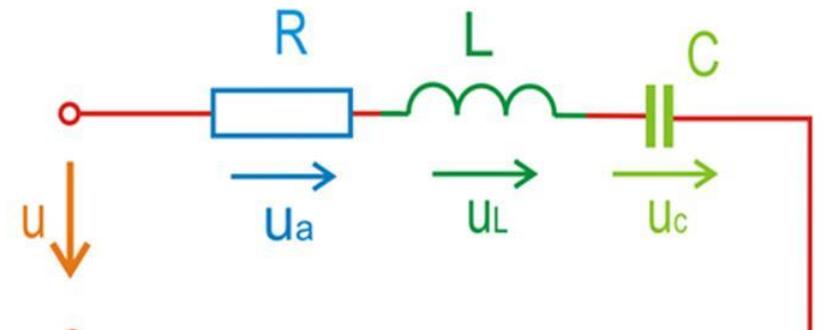
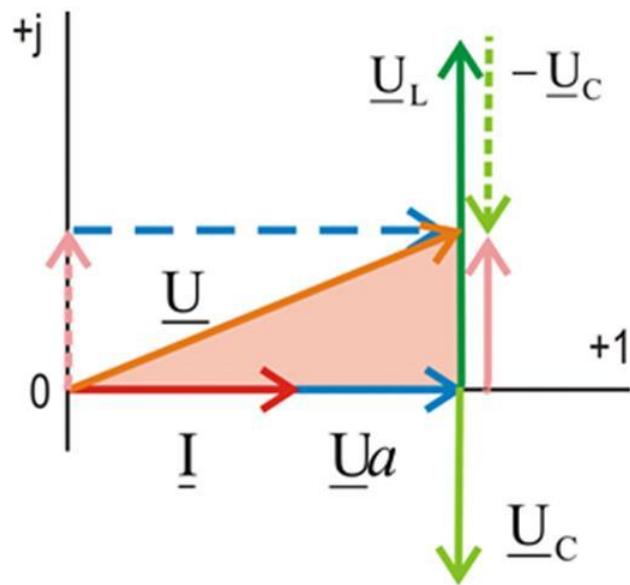
$$u_L = U_{Lm} \sin(\omega t + \frac{\pi}{2})$$

$$u_c = U_{Cm} \sin(\omega t - \frac{\pi}{2})$$

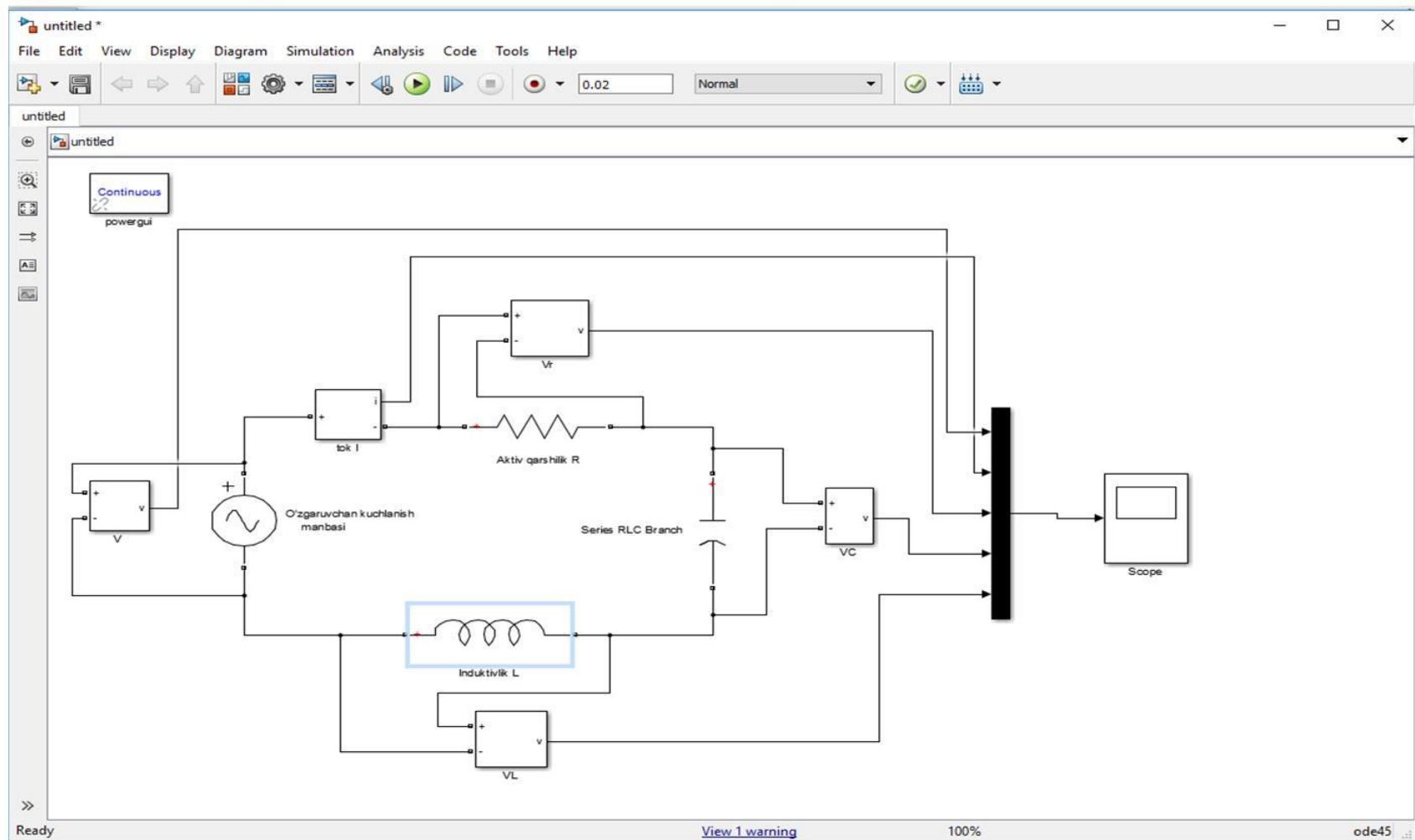


$$\begin{aligned}
 u &= u_a + u_L + u_c = U_{a,m} \sin \omega t + U_{Lm} \sin(\omega t + \frac{\pi}{2}) + U_{Cm} \sin(\omega t - \frac{\pi}{2}) = \\
 &U_m \sin(\omega t \pm \varphi)
 \end{aligned}$$

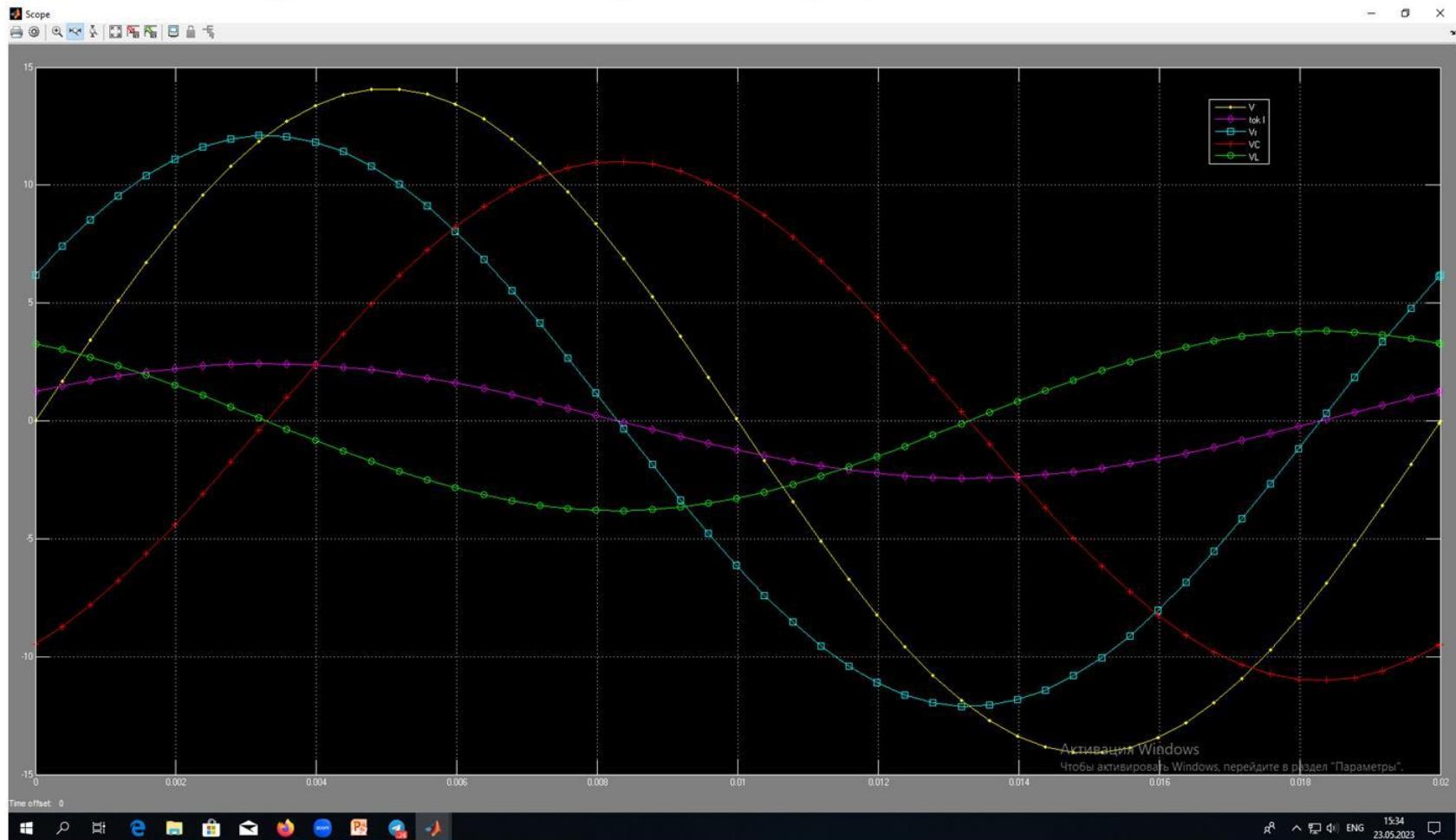
Elektr zanjirini sintez qilish : (2)



Elektr zanjirini sintez qilish : (3)



Elektr zanjirini sintez qilish : (4)



E'tiborlaringiz uchun rahmat !

Murojaat uchun :



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