

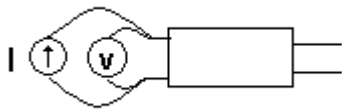
Laboratoorne töö aines sidud, signaalid, süsteemid

Töö nr.3 : Kakspordid (makett III)

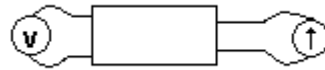
Töö teostaja: Rait Rand 960737

Mõõtmiskeevid ja nende põhjal arvutatud maatriksid:

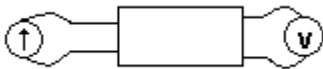
1. Sõltumatud voolud e. Z-maatriks.



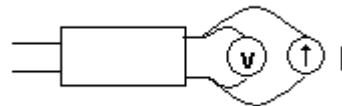
$$Z_{11} = V/I \quad V=0,36V$$



$$Z_{12} = V/I \quad V=0,12V$$



$$Z_{21} = V/I \quad V=0,12V$$

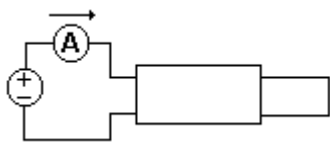


$$Z_{22} = V/I \quad V=0,44V$$

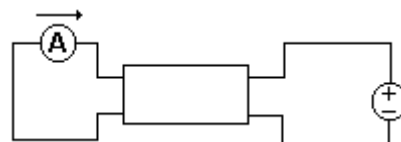
I=10 mA

36	12
12	44

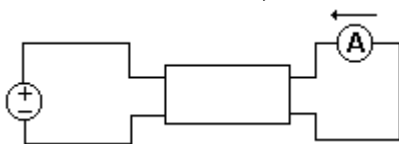
2. Sõltumatud pinged e. y-maatriks:



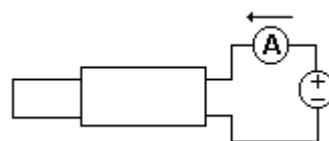
$$Y_{11} = I/V \quad I=0,0325A$$



$$Y_{12} = I/V \quad I= -0,009A$$



$$Y_{21} = I/V \quad I= -0,009A$$

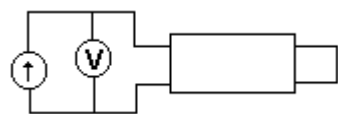


$$Y_{22} = I/V \quad I=0,0275A$$

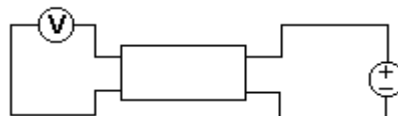
V=2V

0,01625	-0,0045
-0,0045	0,01375

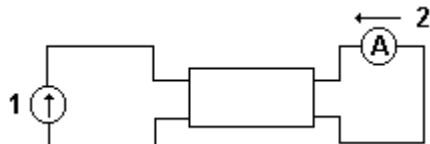
3. h – parameetrid e. hübriidmaatriks:



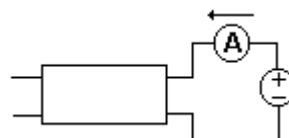
$$h_{11} = V/I \quad V = 0,32V \quad I = 0,01A$$



$$h_{12} = V_1/V_2 \quad V_1 = 0,6V \quad V_2 = 2V$$



$$h_{21} = I_2/I_1 \quad I_1 = 0,01A \quad I_2 = -0,003A$$



$$h_{22} = I/V \quad I = 0,025A \quad V = 2V$$

32	0,3
-0,3	0,0125

4. Ahel-, kaskaad-, ABCD – parameetrid:



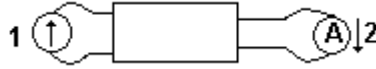
$$A = V_1/V_2 \quad V_1 = 2V \quad V_2 = 0,35V$$



$$B = V_1/-I_2 \quad V_1 = 2V \quad I_2 = -0,009A$$



$$C = I/V \quad I = 0,01A \quad V = 0,12V$$



$$D = I_1/-I_2 \quad I_1 = 0,01A \quad I_2 = -0,003A$$

5,71	222,2
0,083	3,33

5. G-parameetrid e. h-matriksi pöõrdmaatriks.

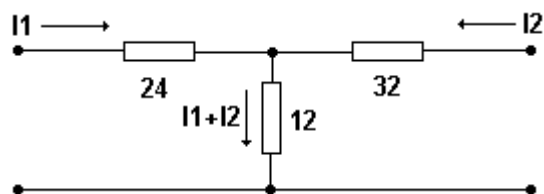
$$\text{Det}(h) = 0,49$$

0,03	-0,6
0,6	65

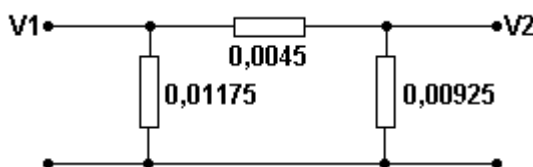
6. T ja Π aseskeemid:

Nagu arvatud Y ja Z maatriksist on näha, on tegu pööratava kaksportiga, (aga mitte sümmeetrilise) sest $Z_{12}=Z_{21}$ ja $Y_{12}=Y_{21}$, seega on tema aseskeemideks järgmised skeemid:

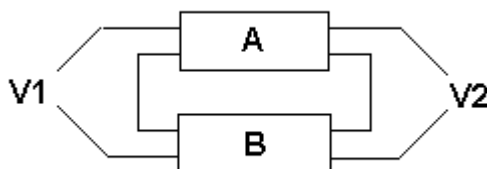
T-aseskeem:



Π-aseskeem:



7. A ja B kaksporti järjestikühendus:



Mõõtsin nii ühendatud kaksportide Z maatriksi.

$I=0,01$ A

130	38,75
38,75	150

Kaksporti B mõõdetud Z-maatriks on:

$I=0,01$ A

90	26
26	102

Kontrolliks vaatan, kas A ja B kaksportide Z-maatriksid on ikka liitunud. Ja tõepoolest liites A-kaksporti Z-parameetrid B-kaksporti Z-parameetritega saamegi mõõdetud ühendatud kaksportide Z-maatriksi.