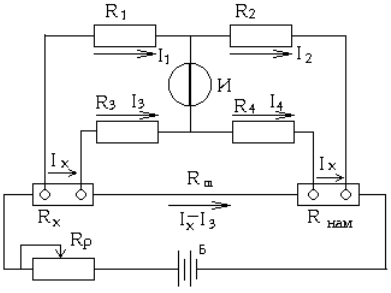
8- mashg`ulot: Elektr zanjir parametrlarini o‘lchash. Ommetrlar, megaommetrlar. Induktivlik, sig‘im, o‘zaroinduktivlik ko‘prikli sxemalar yordamida o‘lchash.

Tayanch iboralari: ko`prik, manba, elka, ikkilamchi elkalar, sig`im, muvozanat, isroflar burchagi, dielektrik, induktivlik, o`zaro induktivlik, tenglamalar, ko`ngilchanlik (dobrotnostp), echimga keltirish, yuqori kuchlanish manbai.

$$\left.\begin{aligned} &I_X R_X + I3\cdot R3 - I1R1 = 0\\ &I_X R_{нам} + I3\cdot R4 - I1R2 = 0\\ &(I_X - I3)R_{нам} - I3(R3+R4) = 0 \end{aligned}\right\}$$



Bahzi o`zgartirishlardan so`ng quyidagini olamiz.

$$R_x = \frac{R1}{R2}R_{нам} + \frac{R4\cdot R_ш}{R3+R4+R_ш}\left(\frac{R1}{R2} - \frac{R3}{R4}\right),$$

YUqoridagi ifodalarda R1, R2, R3, R4 – ikkilamchi elkalar qarshiliklari, Rx, Rnam – birlamchi elkalardagi nomaolum va namunaviy qarshiliklar.

Agar R2/R1 = R3/R4 bo`lsa va Rsh juda oz bo`lsa (Ix > 10 A bo`lganda bu shart bajariladi):

$$\boldsymbol{R_x = \frac{R1}{R2}R_{нам}}$$

Amalda bir va ikkilangan ko`priklarni birgalikda ishlatib $10^8$ dan $10^8$ Ω gacha qarshiliklarni o`lchash mumkin.

Sig`imni o`lchash uchun ishlatiladigan ko`priklar:

Bunday ko`prikning eng oddiy chizmasi suratda keltirlgan. Ular o`zgaruvchan tok manbasi yordamida ishlaydi. Suratda – R1, R2 – namunaviy aktiv qarshiliklar, S_0 – namunaviy sig`im,$S_x$ – nomalum sig`im. Agar sig`imda isroflar bo`lmasa (tgδ⇒0) ko`prikning muvozanat sharti:

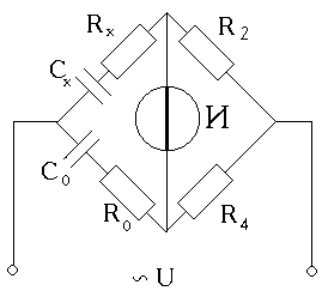
$$\frac{1}{j\omega C_x}\cdot R_4 = \frac{1}{j\omega C_0}R_2 \quad \text{yani} \quad C_x = \frac{R_4}{R_2}C_0$$

Sig`imli elkalarda birgina sig`im qarshiligi bo`lib, aktiv qarshilik bo`lmasa, ko`prik bittagina muvozanat tenglamasiga ega. Bu holda faqat birgina parametrni rostlash bilan (R2, R4 yoki S_0) natijani topish mumkin.

Aktiv isroflari bor kondensatorning sig`imini o`lchash uchun (tyδ>0) quyidagi ko`prik chizmasidan foydalaniladi.

Uning muvozanat tenglamasi $(Rx - jXx)R4 = (R_0 - jX_0)R2$ ikkiga bo`linib ketadi:

$$\left.\begin{aligned} &RxR4 = R_0R2\\ &XxR4 = X_0R2 \end{aligned}\right\}$$ bundan



Aktiv qarshilikni $Rx = \frac{R2}{R4}R_0$,

sig`im qarshiligini $X_c = \frac{1}{\omega Cx} = \frac{R2}{R4}X_0$

ifodalari bilan topamiz. Nomaolum sig`imni topish uchun $C_X = \frac{R4}{R2}C_0$ ifodasidan foydalanamiz.