

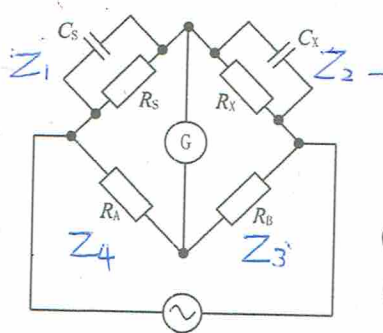
A-3 図に示す交流ブリッジ回路が平衡状態にあるとき、抵抗 R_x 及び静電容量 C_x を求める式の組合せとして、正しいものを下の番号から選べ。

1 $R_x = \frac{R_A}{R_B} R_s [\Omega]$, $C_x = \frac{R_B}{R_A} C_s [F]$

2 $R_x = \frac{R_A}{R_B} R_s [\Omega]$, $C_x = \frac{R_A}{R_B} C_s [F]$

3 $R_x = \frac{R_B}{R_A} R_s [\Omega]$, $C_x = \frac{R_B}{R_A} C_s [F]$

4 $R_x = \frac{R_B}{R_A} R_s [\Omega]$, $C_x = \frac{R_A}{R_B} C_s [F]$



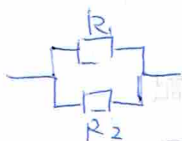
R_s, R_A, R_B : 抵抗 $[\Omega]$

C_s : 静電容量 $[F]$

G: 検流計

~: 交流電源

$\frac{1}{2\pi f c} \left(\frac{1}{j\omega C_s} \right)$



$\frac{1}{\frac{1}{R_1} + \frac{1}{R_2}}$

$\frac{1}{\frac{1}{j\omega C_s} + \frac{1}{j\omega C_x}} = j\omega C_s$

$Z_1 = Z_2 = Z_4 = Z_3$

$Z_1 Z_3 = Z_2 Z_4 \dots \textcircled{1}$

$\frac{1}{\frac{1}{R_s} + j\omega C_s} R_B = \frac{1}{\frac{1}{R_x} + j\omega C_x} R_A$

$R_B \left(\frac{1}{R_s} + j\omega C_x \right) = R_A \left(\frac{1}{R_x} + j\omega C_s \right)$

$\frac{R_B}{R_x} + j\omega R_B C_x = \frac{R_A}{R_s} + j\omega R_A C_s$

$\frac{R_B}{R_x} = \frac{R_A}{R_s}$

$R_x = \frac{R_B}{R_A} R_s$

$\omega R_B C_x = \omega R_A C_s$

$C_x = \frac{R_A}{R_B} C_s$

$Z_1 = \frac{1}{\frac{1}{R_s} + j\omega C_s}$
 $Z_2 = \frac{1}{\frac{1}{R_x} + j\omega C_x}$
 $Z_3 = R_B$
 $Z_4 = R_A$