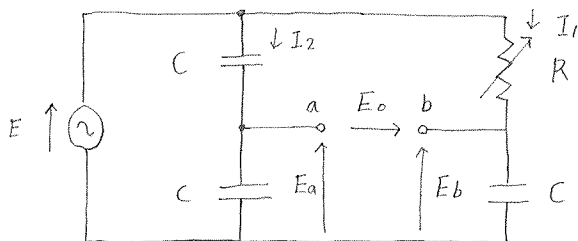


平成 18 年度 交流回路・アナログ電子回路

I



$$(1) \quad E = \left(\frac{1}{j\omega C} + \frac{1}{j\omega C} \right) I_2 = \frac{2}{j\omega C} I_2$$

$$\therefore I_2 = \frac{j\omega C E}{2}$$

$$\text{また } E = \left(R + \frac{1}{j\omega C} \right) I_1 = \frac{1+jR\omega C}{j\omega C} I_1$$

$$\therefore I_1 = \frac{j\omega C E}{1+jR\omega C}$$

$$\frac{I_2}{I_1} = \frac{\frac{j\omega C E}{2}}{\frac{j\omega C E}{1+jR\omega C}} = \frac{1+jR\omega C}{2}$$

$$\therefore G_1 = \frac{\sqrt{1+R^2\omega^2 C^2}}{2}$$

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$$(2) \quad E_a = \frac{\frac{1}{j\omega C}}{\frac{2}{j\omega C}} E = \frac{1}{2} E, \quad E_b = \frac{\frac{1}{j\omega C}}{R + \frac{1}{j\omega C}} E = \frac{1}{1+jR\omega C} E$$

$$E_o = E_b - E_a = \left(\frac{1}{1+jR\omega C} - \frac{1}{2} \right) E = \frac{2-1-jR\omega C}{2(1+jR\omega C)} E = \frac{1-jR\omega C}{2(1+jR\omega C)} E$$

$$\therefore G_E = \frac{1}{2}$$

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$$(3) \quad E_o = \frac{1-2jR\omega C-R^2\omega^2 C^2}{2(1+R^2\omega^2 C^2)} E$$

$$E_o = e^{j\frac{\pi}{2}} E \quad \text{よ')}$$

$$\therefore -\tan^{-1} \frac{-2R\omega C}{1-R^2\omega^2 C^2} = \frac{\pi}{2} \quad \text{よ') } 1-R^2\omega^2 C^2 = 0$$

$$R = \frac{1}{\omega C}$$

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