

問3

I - i

$$(1) \oint_c \vec{H} \cdot d\vec{l} = N_1 I_1 \Leftrightarrow H = \frac{N_1 I_1}{2r} \quad \Phi_{11} = \int_s \vec{B} \cdot d\vec{S} \quad \text{よ} \quad \Phi_{11} = \int_s \mu H_1 dS = \frac{\mu N_1 I_1}{2r} a^2 = \frac{\mu N_1 I_1}{2r} a^2$$

$$(2) \quad \Phi_{11} = \frac{\mu N_1^2 I_1}{2r} a^2$$

$$(3) \quad \Phi_{11} = L_1 I_1 \quad \text{よ} \quad L_1 = \frac{\mu N_1^2}{2r} a^2$$

$$(4) \quad (1) \text{と同様にして、} \quad \Phi_{21} = \int_s \mu H_1 dS = \frac{\mu N_1 I_1}{2r} a^2$$

$$(5) \quad \Phi_{21} = \frac{\mu N_1 N_2 I_1}{2r} a^2$$

$$(6) \quad \Phi_{21} = M_{21} I_1 \quad \text{よ} \quad M_{21} = \frac{\mu N_1 N_2}{2r} a^2$$

I - ii

$$(1) \text{ I - i (1)と同様にして、} \quad \Phi_{22} = \frac{\mu N_2^2 I_2}{2r} a^2$$

$$(2) \quad (1) \text{よ} \quad \Phi_{22} = \frac{\mu N_2^2 I_2}{2r} a^2$$

$$(3) \quad \Phi_{22} = L_2 I_2 \quad \text{よ} \quad L_2 = \frac{\mu N_2^2}{2r} a^2$$

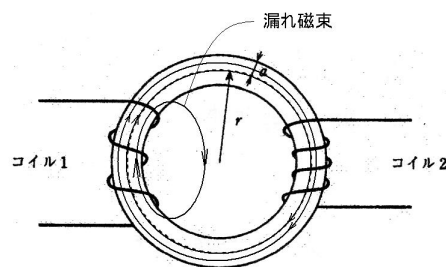
$$(4) \quad (1) \text{と同様にして、} \quad \Phi_{12} = \int_s \mu H_1 dS = \frac{\mu N_2 I_2}{2r} a^2$$

$$(5) \quad \Phi_{12} = \frac{\mu N_1 N_2 I_2}{2r} a^2$$

$$(6) \quad \Phi_{12} = M_{12} I_2 \quad \text{よ} \quad M_{12} = \frac{\mu N_1 N_2}{2r} a^2$$

II - i

(1)



$$(2) \quad L_1 = \frac{\mu N_1^2}{2r} a^2$$

$$(3) \quad \Phi_{21} = k \frac{\mu N_1 I_1}{2r} a^2 \quad \text{よ} \quad \Phi_{21} = k \frac{\mu N_1 N_2 I_1}{2r} a^2 \quad \text{したが} \quad M_{21} = \frac{\Phi_{21}}{I_1} = k \frac{\mu N_1 N_2}{2r} a^2$$

II - ii

$$(1) \quad L_2 = \frac{\mu N_2^2}{2r} a^2$$

$$(2) \quad \Phi_{12} = k \frac{\mu N_2 I_2}{2r} a^2 \quad \text{よ} \quad \Phi_{12} = k \frac{\mu N_1 N_2 I_2}{2r} a^2 \quad \text{したが} \quad M_{12} = \frac{\Phi_{12}}{I_2} = k \frac{\mu N_1 N_2}{2r} a^2$$

$$(3) \quad M_{21} = k L_1, \quad M_{12} = k L_2$$

*絶対間違いあるので、指摘してください。