電気磁気学

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概要

一関高専電気情報工学科の電気磁気学I，電気磁気学II，電気磁気学IIIの講義をまとめたもの
構成を少し変えてるため，授業の板書と一致しない

$$e \propto \frac{\Delta\phi}{\Delta t} \tag{0.1}$$

$$e = -\frac{d\phi}{dt}\,[N] \tag{0.2}$$

$$e = -n\frac{d\phi}{dt}\,[N] \tag{0.3}$$

$$e = -\frac{d\psi}{dt}\,[V] \tag{0.4}$$

$$\psi = n\phi\,[Wb] \tag{0.5}$$

$$\begin{aligned} e &= -n\frac{d\phi}{dt} && (0.6)\\ &= -n\frac{d}{dt}BS && (0.7)\\ &= -n\frac{d}{dt}\left(B\left(y\cdot x\cdot\cos\theta\right)\right) && (0.8) \end{aligned}$$

$$\begin{aligned} e &= -n\frac{d}{dt}\left(Byx\cos\omega t\right) && (0.9)\\ &= -nBxy\left(-\sin\omega t\right)\cdot\omega && (0.10)\\ &= n\omega xyB\sin\omega t\,[V] && (0.11) \end{aligned}$$

$$\begin{aligned} qE &= \varepsilon vB && (0.12)\\ E &= v_B\,[V/m] && (0.13) \end{aligned}$$

$$e = vBl\,[V] \tag{0.14}$$

$$\overrightarrow{e} = \left(\overrightarrow{v} \times \overrightarrow{B}\right) l\,[V] \tag{0.15}$$

$$W_m = F \times (v \times \Delta t) \tag{0.16}$$
$$= IlB \times v \times \Delta t\,[J] \tag{0.17}$$

$$W_e = e \times I \times \Delta t \tag{0.18}$$
$$= V \times B \times l \times I \times \Delta t\,[J] \tag{0.19}$$

$$W_m = W_e \tag{0.20}$$