

Chapter 29 – Suggested problems

6, 7, 9, 14, 16, 20, 32, 34, 56, 73

Solutions of even suggested problems

(6) (a) $\epsilon = 0.0302 \text{ V} + (3.02 \times 10^{-4} \text{ V/s}^3) t^3$
(b) $\epsilon = 0.068 \text{ V}$, $I = 1.13 \times 10^{-4} \text{ A}$

(14) Flux is constant, induced emf = 0

(16) Magnetic field outward through round coil and decreasing \rightarrow magnetic field due to induced current also point outward to oppose decrease \rightarrow induced current counterclockwise.

(20) (a) 5.6 V

(b) (i) F upward, F pushes current counter-clockwise direction

(ii) Magnetic Flux > 0 increasing in magnitude $\rightarrow \epsilon < 0 \rightarrow$ emf counterclockwise.

(iii) Magnetic flux increasing \rightarrow induced current cause B out of paper to oppose increase \rightarrow current flow counterclockwise.

(c) $I = 0.22 \text{ A}$

(32) (a) $E = 2.81 \times 10^{-3} \text{ V/m}$

(b) Induced I counter clockwise

(34) $i_D = 21 \times 10^{-6} \text{ A} \rightarrow t = 5\text{s}$

(56) (a) $v = (10 \text{ m/s})(1 - e^{-t/3.1})$

(b) $I = 2.4 \text{ A}$, $F = 2.88 \text{ N}$, $a = 3.2 \text{ m/s}^2$

(c) $v = 2 \text{ m/s}$, $a = 2.6 \text{ m/s}^2$

(d) $v = 10 \text{ m/s}$ makes $a = 0$