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* Page 211 & 213, EXERCISE QUESTIONS

39. a) induced emf = BLv

$$\begin{aligned}\text{induced emf} &= 50 \times 10^{-6} \times 0.2 \times 20 \\ &= 2 \times 10^{-4} \text{ V}\end{aligned}$$

b) $V = IR$

$$2 \times 10^{-4} = I \times 2$$

$$I = \frac{2 \times 10^{-4}}{2}$$

$$I = 1 \times 10^{-4} \text{ A}$$

c) $P = I^2 R$

$$P = (1 \times 10^{-4})^2 \times 2$$

$$P = 2 \times 10^{-8} \text{ W}$$

$$\text{Power} = \frac{\text{work done}}{\text{time taken}}$$

$$2 \times 10^{-8} = \frac{W}{1}$$

$$W = 2 \times 10^{-8} \text{ J}$$

d) $2 \times 10^{-8} \text{ J}$ ~~displacement is not necessary~~

e) WORK DONE = FORCE $\times$ DISTANCE

$$2 \times 10^{-8} = 1 \times 10^{-4} \times s$$

$$s = 2 \text{ m}$$

f) $1 \times 10^{-4} \text{ N}$

40. a) Magnetic flux is the product of magnetic field strength and perpendicular area.

$$\therefore \text{TOTAL FLUX} = 5000 \times 10^{-6} \times 2 \times 10^{-4} = 2 \times 10^{-6} \text{ Tm}^2$$

$$1 \text{ m}^2 = 10\,000 \text{ cm}^2$$

$$1 \times 10^{-4} \text{ m}^2 = 1 \text{ cm}^2$$

$$2 \times 10^{-4} \text{ m}^2 = 2 \text{ cm}^2$$

