

$$L = 30.0 \cdot 10^{-2} \text{ m}$$

$$B = 0.450 \text{ T}$$

$$v = 5.00 \text{ m/s}$$

(a)  $\mathcal{E}_{ab} = ?$

Motional emf is  $\mathcal{E}_{ab} = BLv$

$$\mathcal{E} = 0.675 \text{ V}$$

(b)  $\Delta V_{ab} = \mathcal{E}_{ab} = 0.675 \text{ V}$

(c) By RHR  $I$  is to the right towards  $b$ .

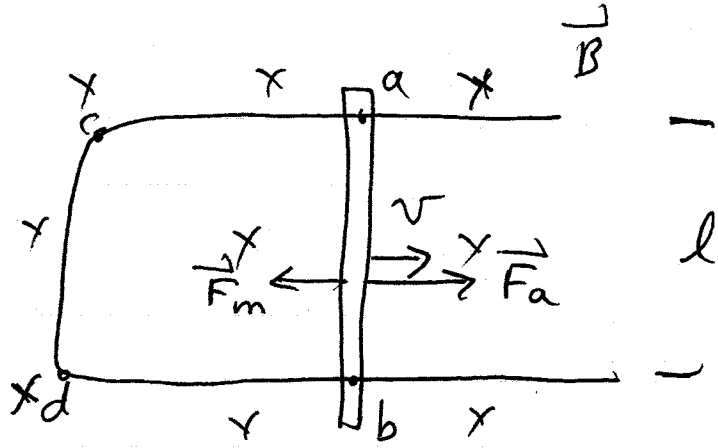
$$\therefore V_b > V_a$$

(d)  $\vec{E}$  in rod is  $E = \frac{V_{ab}}{L} = \frac{0.675}{0.300} = 2.25 \text{ V/m}$   
to left towards  $a$

(e)  $V_a > V_b \Rightarrow b$  has more +ve charge

$$B = 0.800 \text{ T}$$

$$l = 0.500 \text{ m}$$



(a)  $v = 7.50 \text{ m/s}$   $\mathcal{E} = ?$

$$\mathcal{E}_{ab} = Blv = 3.00 \text{ V}$$

(b) Current flows from  $b \rightarrow a$  (by RHR)

(c)  $R_{abcd} = 1.50 \Omega$   $\therefore I = \frac{\mathcal{E}_{ab}}{R} = 2.00 \text{ A}$

But  $|\vec{F}_a| = |\vec{F}_m|$  at eqm (const  $v$  to right)

$$\therefore F_a = F_m = Il \times B = IRB$$

$$\therefore F_a = 0.800 \text{ N to right}$$

(d) Mech work/time  $P_{\text{mech}} = F_a v = 6.00 \text{ W}$

But  $P_{\text{elec}} = I^2 R = 6.00 \text{ W}$