17.25 (a) zero, the system is at equilibrium so no drive to go anywhere
(b) $\mathcal{E} = \mathcal{E}^\circ$

17.26 $Cu \longrightarrow Cu^{2+} + 2e^-$ $\quad \mathcal{E}^\circ_{ox} = -0.3419\ V$

$2Ag^+ + 2e^- \longrightarrow 2Ag$ $\quad \mathcal{E}^\circ_{red} = 0.7996\ V$

$Cu + 2Ag^+ \longrightarrow Cu^{2+} + 2Ag$ $\quad \mathcal{E}^\circ = 0.4577\ V$

$\mathcal{E} = \mathcal{E}^\circ - \frac{RT}{nF} \ln Q$

$= 0.4577 - \frac{0.05916\ V}{2} \log \frac{[Cu^{2+}]}{[Ag^+]^2}$

plugging into above Nernst equation:
(a) 0.4577 V (b) 0.4599 V (c) 0.50 V (d) 0.4488 V

17.27 (a) $\Delta G^\circ = -nF\mathcal{E}^\circ = -2\ mole\ e^- \times \frac{96485\ C}{mole\ e^-} \times \frac{0.4577\ J}{C} = -8.832 \times 10^4\ J$

$K = \exp -\frac{\Delta G}{RT} = 2.97 \times 10^{15}$ BIG!

(b) if $G = 0 = -nF\mathcal{E}$, then @ equilibrium $Q = K$

$K = \frac{[Cu^{2+}]}{[Ag^+]^2} = 2.97 \times 10^{15}$ $\quad [Ag^+] = \sqrt{\frac{1.000}{2.97 \times 10^{15}}} = 1.83 \times 10^{-8}\ M$

(c) $[Ag^+] = \sqrt{\frac{[Cu^{2+}]}{K}} = \sqrt{\frac{5.000}{2.97 \times 10^{15}}} = 4.10 \times 10^{-8}\ M$

(d) $[Cu^{2+}] = K[Ag^+]^2 = (2.97 \times 10^{15})(1.000)^2 = 2.97 \times 10^{15}\ M$

the equilibrium constant is huge so reaction goes essentially to completion and we get lots of Cu^{2+} and not much Ag^+

17.28 $\mathcal{E} = \mathcal{E}^\circ - \frac{0.05916\ V}{2} \log \frac{[Cu^{2+}]}{[Ag^+]^2} = 0.4577^\circ - \frac{0.05916\ V}{2} \log \frac{1.000\ M}{[Ag^+]^2}$

(a) solve for $\log \frac{1.000\ M}{[Ag^+]^2} = \frac{n(\mathcal{E}^\circ - \mathcal{E})}{0.05916\ V} = \frac{2(0.4577\ V - 0.5000\ V)}{0.05916\ V} = -1.430$

$[Ag^+] = \sqrt{\frac{[Cu^{2+}]}{10^{\log Q}}} = \sqrt{\frac{1}{10^{-1.43}}} = 5.19\ M$

(b) do above, $[Ag^+] = 1.1\ M$

(c) $[Ag^+] = 0.231\ M$