(a) $\Delta G = \dfrac{-Ce^2 N_A}{(40)(3.5 \times 10^{-10}\ m)} = -9.9 \times 10^3 \dfrac{kJ}{mole}$

b. $HA^+ \rightleftharpoons H^+ + A$

$$\Delta G^\circ_{His} = \Delta G^\circ_{H_2O} + 9.9 \times 10^3 \frac{kJ}{mole}$$

$$2.303\, RT(pK_{A\text{-}His}) = 2.303 RT(pK_{A\text{-}H_2O}) + 9.9 \times 10^3 \frac{kJ}{mole}$$

$$pK_{a\,His} = 6.04 + \frac{9932}{(8.314)(298)(2.303)} = 7.78$$

c. The negative charge on Asp makes it more favorable for His to be protonated w/ positive charge $\Rightarrow$ why $pK_a \uparrow$.

d. $pK_A \downarrow \Rightarrow$ the positive charge on His make it more favorable for Asp to be deprotonated and have negative charge.