1-6)

 $p = 6x10^{-30}$ Cm; $E = 3.5 \times 10^{+6}$ N/C; $U = -pEcos\theta_{p,E}$

U when p and E are perpendicular is 0;

U when they are parallel is $-pE = -(6x10^{-30})(3.5 \times 10^{+6}) = -2.1 \times 10^{-23} \text{ J};$

U when they are anti-parallel is $+ pE = (6x10^{-30})(3.5 \times 10^{+6}) = + 2.1 \times 10^{-23} \text{ J};$

The difference is then 4.2×10^{-23} J.