

**Worksheet # 4**

Friday, April 12, 2024

**Name****Questions (5 pts):**

Consider the  $2p \rightarrow 1s$  transition in the hydrogen atom and  $\text{He}^+$  ion. The lifetime of the  $2p$  excited state is defined as  $\tau_{2p} = 1/W_{2p-1s}$  (where  $W_{2p-1s}$  is the transition rate for spontaneous emission). The lifetime of the  $2p$  state of the hydrogen atom is 1.6 ns. What is the lifetime of the  $2p$  state of the  $\text{He}^+$  ?