

## Automata and Formal Languages Quiz

姓名：

學號：

**Problem**      *Examine the formal definition of a Turing machine to answer the following questions, and explain your reasoning.*

1. *Can the tape alphabet  $\Gamma$  be the same as the input alphabet  $\Sigma$ ?*
2. *Can a Turing machine's head ever be in the same location in two successive steps?*
3. *Can a Turing machine contain just a single state?*
4. *Can a Turing machine ever write the blank symbol  $\sqcup$  on its tape?*
5. *Can a Turing machine never halt for all inputs?*