

Name: \_\_\_\_\_ Student ID:

**Math 166 - Theory of Computability - Fall 1999**

**Quiz #8 — December 9**

1. Draw the state diagram of a Turing machine  $M$  which has input alphabet  $\Sigma = \{0, 1\}$  and which performs as follows on input  $w$ . If  $w = av$  where  $a$  is a symbol 0 or 1, then  $M$  changes the tape contents to  $ava$  and halts in  $q_{accept}$ . If  $w = \epsilon$ ,  $M$  does nothing to the tape contents and just halts in  $q_{accept}$ .

In other words,  $M$  copies the first symbol of  $w$  (if any) to the end of  $w$ .