

EECS20n, Quiz 2, 02/09/04

The quiz will take 10 minutes. Write your response on the sheet.

Please print your name and lab time here:

Last Name _____ First _____ Lab time _____

Consider the 'bubble and arcs' diagram of Figure 1.

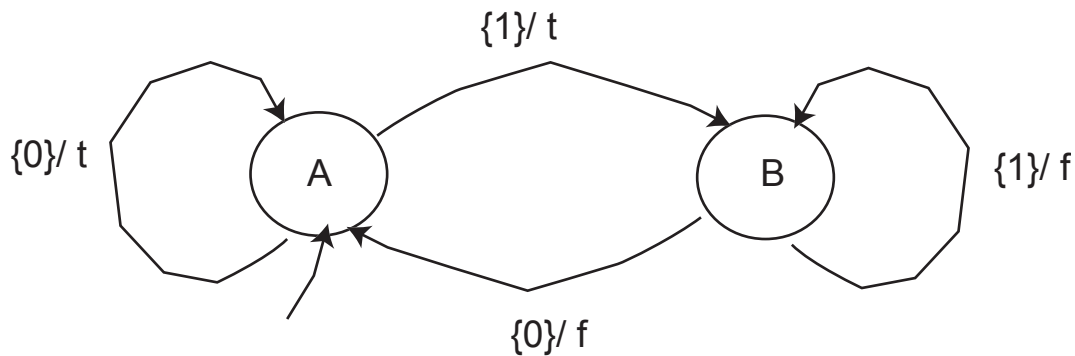


Figure 1: State machine

1. Add arcs corresponding to the input *absent* to Figure 1.

2. For the state machine, what are:

States = *Inputs* = *Outputs* = *initialState* =

InputSignals = *OutputSignals* =

3. For the input signal x shown below, write down the corresponding state response s and output signal y .

| | | | | | | |
|-------|---|---------------|---|---|---|-----|
| $n =$ | 0 | 1 | 2 | 3 | 4 | ... |
| $x =$ | 0 | <i>absent</i> | 0 | 1 | 1 | ... |
| $s =$ | | | | | | |
| $y =$ | | | | | | |

4. This state machine defines an input-output function $F: \text{InputSignals} \rightarrow \text{OutputSignals}$. Write this function as the expression below [Note that the input symbol *absent* is not considered]:

$$\forall x \in [\text{Nats}_0 \rightarrow \{0, 1\}], \forall n \in \text{Nats}_0$$

$$F(x)(n) =$$