

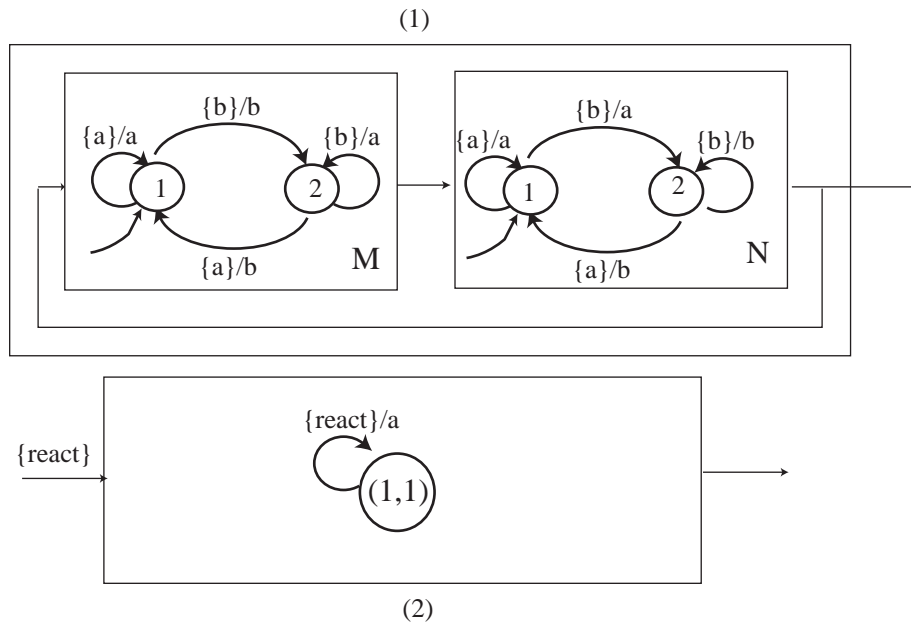
EECS20n, Quiz 3, 9/30/04, Solution

1. 4 points

(i) Put a box around the correct choice concerning (1):

M , N , M and N , neither M nor N has state-determined output.

(ii) Give the state machine (2) of the composition.



2. 6 points For each statement below, determine if it is true or false and put a box around your answer.

(1) There is no 2-state machine with $Inputs = Outputs = \{0, 1\}$ that recognizes the pattern 111. T

(2) If the constant input $x = (0, 0, 0, \dots)$ is input to a machine with n states, the output will eventually be periodic i.e. of the form:

$$y = (y_0, \dots, y_p, y_{p+1}, \dots, y_{p+k}, y_{p+1}, \dots, y_{p+k}, \dots) \quad \boxed{T}$$

(3) If a deterministic machine B simulates machine A with the simulation relation $S_{AB} \subset States_A \times States_B$, then A simulates B with the simulation relation

$$S_{BA} = \{(s_B, s_A) \mid (s_A, s_B) \in S_{AB}\} \quad \boxed{T}$$

(4) Suppose machine B_1 simulates A_1 and B_2 simulates A_2 . Then the cascade composition of B_2 and B_1 simulates the cascade composition of A_2 and A_1 . T