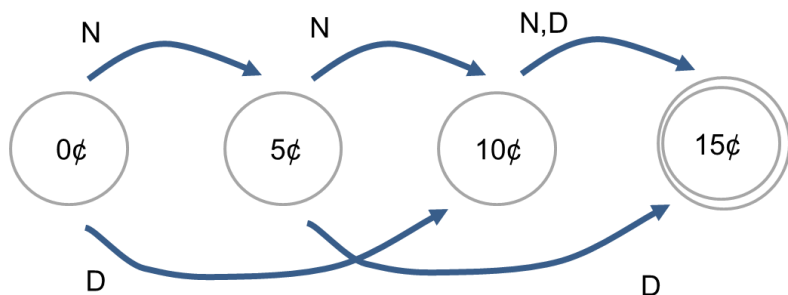


FSM Handout

Name _____

The following state diagram represents a vending machine that will release a candy bar after receiving 15 cents in Nickels (N) or Dimes (D).



This can be expressed with the following FSM.

Formalizing a FSM

- $S = \{0¢, 5¢, 10¢, 15¢\}$
- $q_0 = 0¢$
- $F = \{15¢\}$
- $X = \{N, D\}$

$f(X,S)$		
Curr. State	Coin Rcvd.	Next State
0¢	N	5¢
0¢	D	10¢
5¢	N	10¢
5¢	D	15¢
10¢	N	15¢
10¢	D	15¢

Implement this FSM in sequential logic by answering or performing the following.

- 1) How many Boolean variables are needed to encode the states?

- 2) How many Boolean variables are needed to encode the type of coin deposited?



3) Construct Boolean functions which take as input the current state and type of coin and output the next state (i.e., implement the transition function as Boolean functions). [Hint: Start with truth tables and then reduce the resulting expressions with Kmaps.]