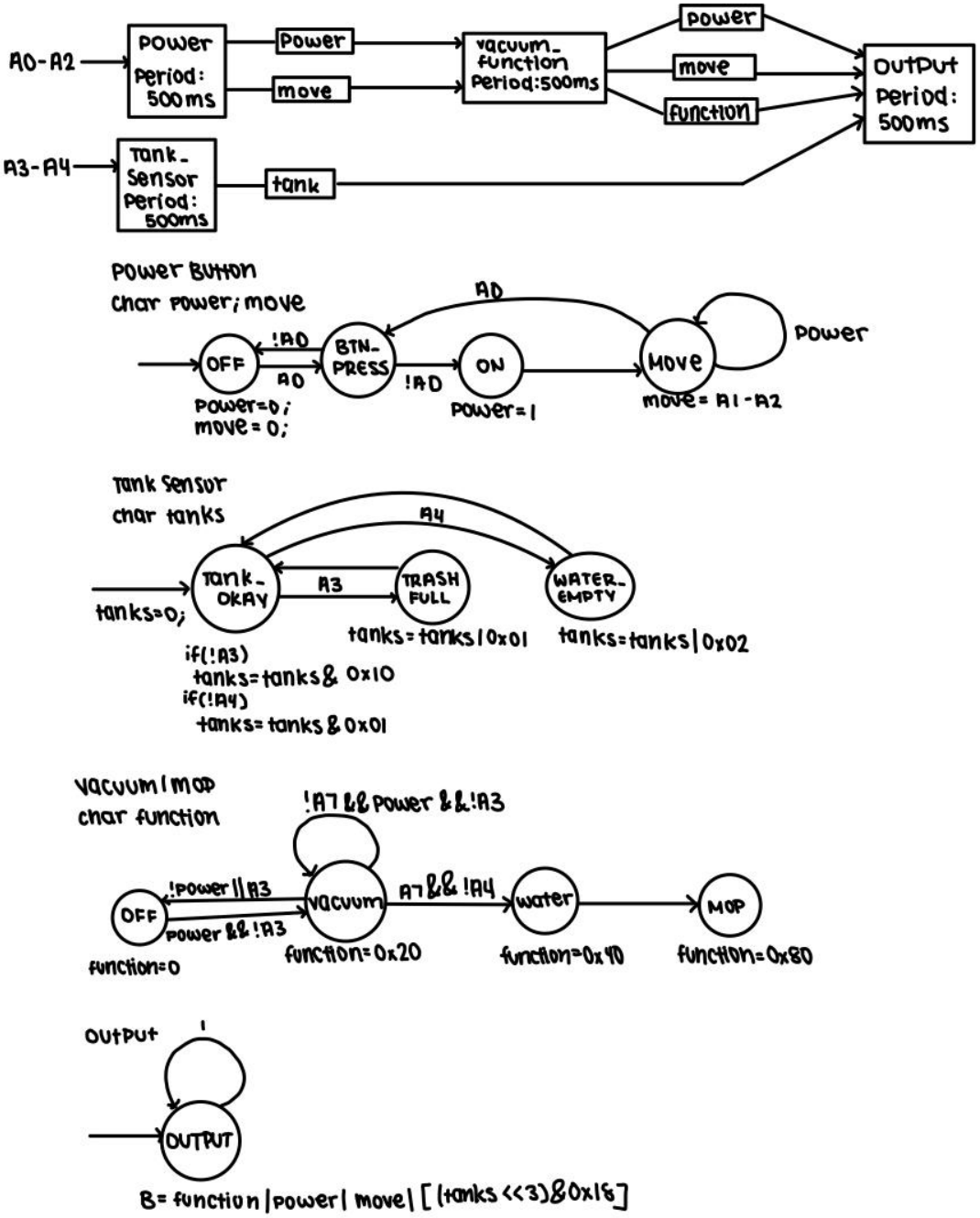
1. **Embedded System Description**

   A real-world embedded system that could be implemented using a concurrent state machine is an automated robot vacuum/mop. A1 powers the vacuum on or off. A sensor (A1-A2) detects the location of the vacuum within a room, which will tell how the robot will move(B1-B2). A3 and A4 are for the trash and water cartridge respectively. If the water tank is empty, the mop will not activate and if the trash tank is filled, the robot will shut off and head back to its charging station will let out a red light to indicate full trash or empty tank(B3 and B4 respectively). There is a sensor (A5) that detects whether the deposit on the floor is liquid. If it's liquid, it will activate the water dispenser(B6) and mop (B7) to wipe it up. The robot is automatically in the vacuum(B5) mode so it will have to be turned off to activate the mop and revert back to vacuum when there is no liquid detected.

2. **SM Diagram**



3. **Testing Strategy**

   Cases that tested:

- When it is not daytime, the lights should be off and the meter should not be active.
- The user is able to add more time to the meter even when the meter is already in use using coins.
- The meter should not be able to read coins when the user has already swipes the card.
- The up and down button should not work when coins are being inserted and do not change the time on the display.
- The meter should automatically enter the off state when it is the end of the day and the meter is still running.
- Lights should change colors when the meter is running and turn back to red when it is done.