Modeling

1. You are tasked with building a static model representing the products sold at a coffee shop. The model should show the relationships between the products, attributes, and methods. (4 points)

Beverages are either hot or cold. A beverage is either made from drip coffee, espresso, or tea. There are various kinds of tea (Earl Grey, Tasmanian, Pekoe, etc.) and various kinds of coffee (Arabica, Robusto, or others). An espresso, a mocha, a cappuccino, and a latte are all made with espresso. The cappuccino and latte are made with milk and are 'frothed' for contrasting times. A mocha has espresso, milk, and chocolate. And is frothed.

All beverages have a price. All cold beverages are served with ice. The policy of the coffee shop is to serve a latte with a complimentary cookie. Drip coffee can only be kept for 1 hour after being made; after that time, it needs to be discarded. Espresso and tea beverages are made on demand for each customer. (put answer on next page, please)

2. A coffeemaker has the following events:

1. Carafe Full. This event is triggered when the carafe is full of coffee.
2. Carafe Empty. This event is trigged when the carafe is empty
3. Tank Full. This event occurs when the cold-water tank is full.
4. Start. This event occurs when the operator presses the button.
5. An internal timer.

The coffeemaker has the following controls or outputs:

1. Dispense Ground Coffee. This is a one-time output that instructs the hardware to release enough ground coffee and a filter for 1 pot of coffee. The action takes place on the low to high transition. (It is a promising idea, but not required, to set the signal true when entering a state, and then clear it when transitioning out of a state)
2. Water On/Off controls the input water supply. (Boolean). When true the water flows into the cold-water tank. When off, the water does not flow.
3. Heater On/Off controls the heater that boils the water from the cold-water tank.(Boolean)
4. If an error condition is encountered, the error light comes on and the device enters an error state. (Error light is Boolean).

To get out of the error state, power must be cycled to the system. At power on, the carafe is empty, and the cold-water tank is empty. The system must diagnose a leaky cold-water tank; if it takes more than 30 seconds to fill the tank, then it is assumed there is a leak or a problem with the water source.

Draw the state diagram of the coffee maker in operation, constrained by the above list of events and controls. (draw on next page, please) (4 points)

In the event some behavior is not described in the above assignment, describe any assumptions you have made about the system.