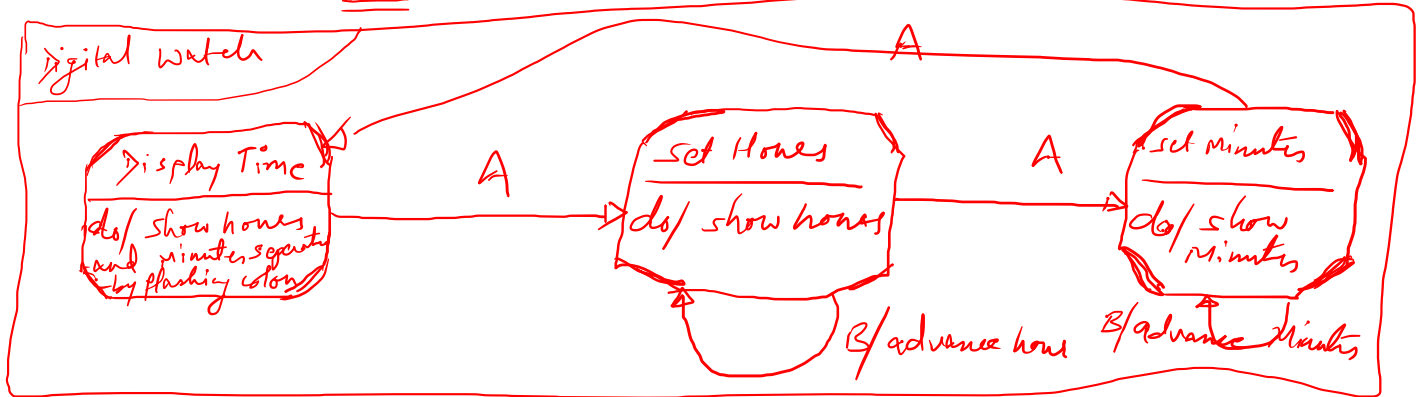


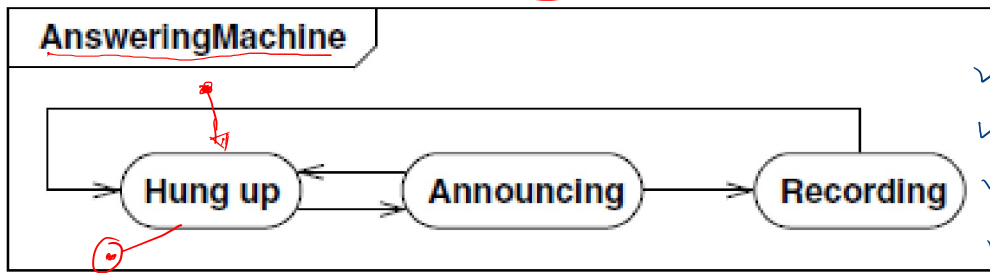
Q. 1. A simple digital watch has a display and two buttons to set it, the A button and the B button. The watch has two modes of operation, display time and set time. In the display time mode, the watch displays hours and minutes, separated by a flashing colon. The set time mode has two sub modes, set hours and set minutes. The A button selects modes. Each time it is pressed, the mode advances in the sequence: display, set hours, set minutes, display, etc. Within the sub modes, the B button advances the hours or minutes once each time it is pressed. Buttons must be released before they can generate another event. Prepare a state diagram of the watch.

Sol :



Q. 2. Figure below is a partially completed and simplified state diagram for the control of a telephone answering machine. The machine detects an incoming call on the first ring and answers the call with a pre-recorded announcement. When the announcement is complete, the machine records the caller's message. When the caller hangs up, the machine hangs up and shuts off. Place the following in the diagram: call detected, answer call, play announcement, record message, caller hangs up, announcement complete.

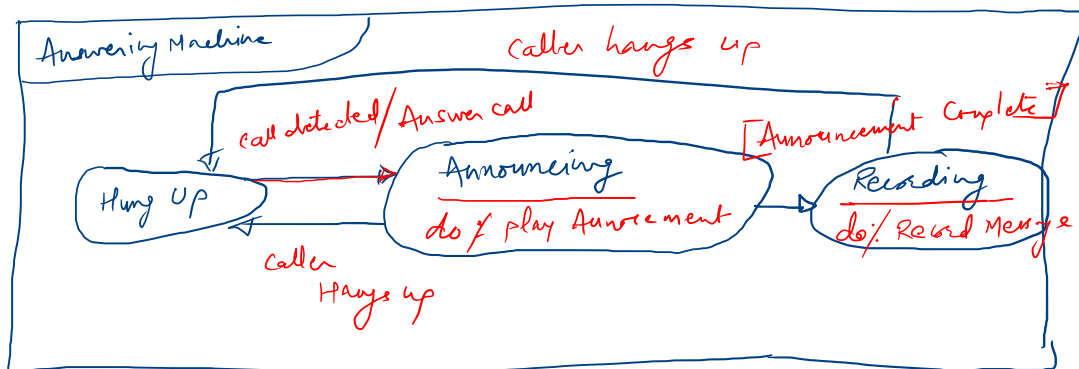
Initial Final state



- 1) Call detected (event)
- 2) answer call (action)
- 3) play announcement (activity)
- 4) record message (activity)
- 5) caller hangs up (event)
- 6) announcement (event) Complete

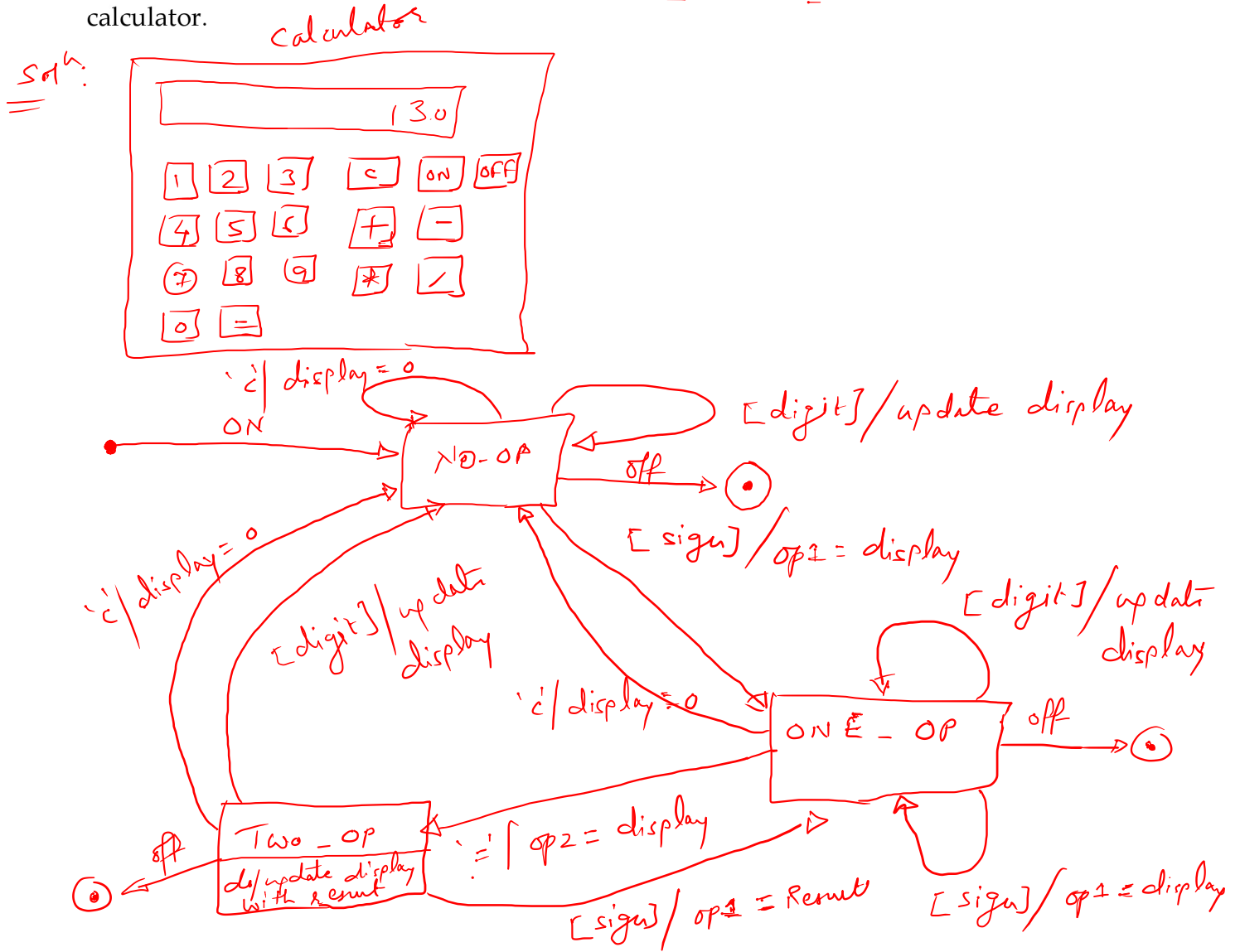
Figure E5.1 Partial state diagram for an answering machine

Sol:



Complete State Diagram

Q. 3. Draw a state chart of a simple calculator. The interface of the calculator is composed of 10 buttons with digits, and 4 buttons with the basic operations (+, -, *, /). The button "C" resets the display. The button "=" displays the result. Buttons "On" and "Off" for starting and stopping the calculator.



Q.4. You're creating a digital pet program. What happens to the pet when he receives different stimuli is determined by the state he's in, so you decide to model the digital pet with a state diagram.

- The behaviour of the digital pet program is as follows:

① When the pet is turned on, it starts out happy.

② If the pet is happy and receives punishment, then he becomes sad.

③ If the pet is sad and receives praise, it becomes happy.

④ If the pet is sad and receives punishment, it is heart-broken.

- Identify the states and transitions of the digital pet and draw a state diagram.

