FIGURE 5.42   The complete finite state machine control for the datapath shown in Figure 5.33. The labels on the arcs are conditions that are tested to determine which state is the next state; when the next state is unconditional, no label is given. The labels inside the nodes indicate the output signals asserted during that state; we always specify the setting of a multiplexor control signal if the correct operation requires it. Hence, in some states a multiplexor control will be set to 0. In Appendix C, we examine how to turn this finite state machine into logic equations and look at how to implement those logic equations.