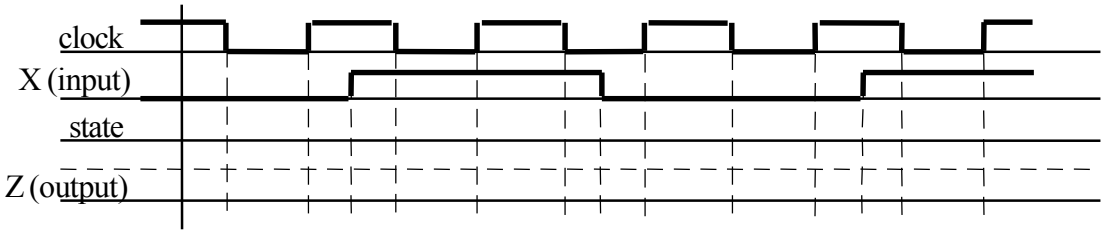
Preparatory Questions of Lab 5

a. The graph given below represents a timing diagram for a Mealy sequential circuit. Assume that the flip-flops in the circuit are D flip-flops which change state on the **rising edge** of the clock pulse.
   - Circle the points on the state axis at which the flip-flops could change state.
   - Circle the points on the Z axis at which Z could change.
   - A "false" output can occur after the flip-flops have changed state but before the input X has changed to the next value. Shade the spaces on the Z part of the diagram during which false outputs could occur.



When using the simulator, a switch will be used to generate the clock pulse. In the laboratory, a push-button will be used. When the button is depressed, the clock goes to 1, and when it is released, the clock goes to 0. Answer the following questions, keeping in mind that the flip-flops we are using trigger on the **rising** edge of the clock pulse:

b. Will the flip-flops change state when the clock switch is changed from 0 to 1, or from 1 to 0?_____

c. Will the output of the above Mealy circuit always be correct after the clock switch goes from 0 to 1?
_____Explain:_____

d. Will the Mealy circuit output always be correct after the input has been changed and before the clock switch is changed from 0 to 1? _____

e. Should you read the output for the first time before or after the first rising edge of the clock pulse? _____

f. On the above timing diagram, draw arrows to indicate the times to read the Z output.

g. For a Mealy circuit, which of the two sequences given below will give the correct output:

   A: 1. Set the input value
      2. Clock the circuit
      3. Read the output

   B: 1. Set the input value
      2. Read the output
      3. Clock the circuit