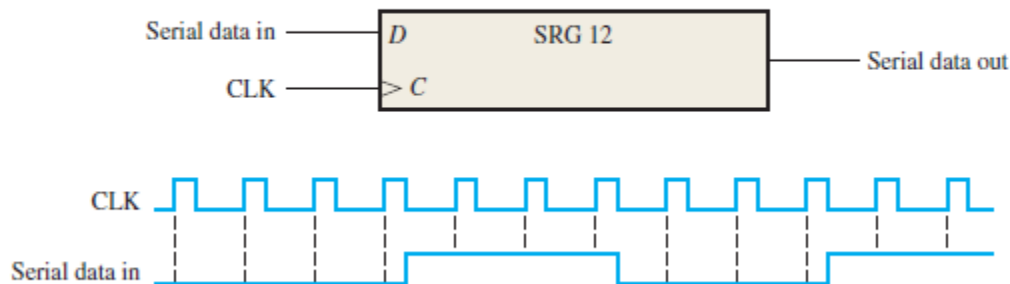


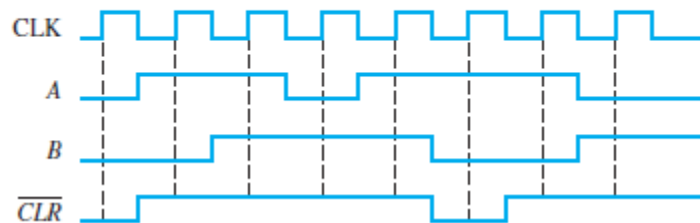
## Practice Problems Chapter-8

1. The sequence 1011 is applied to the input of a 4-bit serial shift register that is initially cleared. What is the state of the shift register after three clock pulses?
  2. If a 10-bit ring counter has an initial state 0101001111, determine the waveform for each  $Q$  output.
  3. How many states are there in an 8-bit Johnson counter sequence? Write down all sequence.
7. What is the state of the register in Figure 8-49 after each clock pulse if it starts in the 101001111000 state?

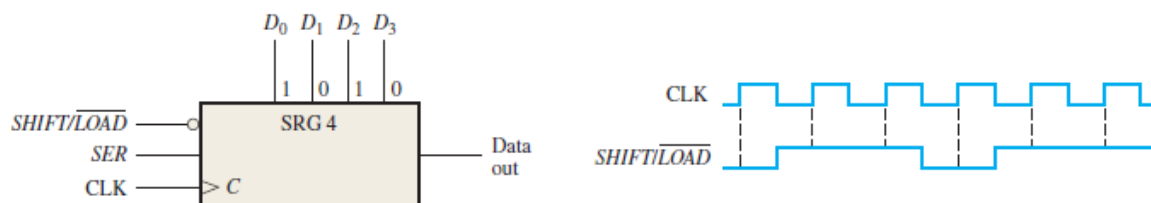


**FIGURE 8-49**

13. Develop the  $Q_0$  through  $Q_7$  outputs for a 74HC164 shift register with the input waveforms shown in Figure 8-53.



14. The shift register in Figure 8-54(a) has  $\overline{SHIFT/LOAD}$  and CLK inputs as shown in part (b). The serial data input ( $SER$ ) is a 0. The parallel data inputs are  $D_0 = 1$ ,  $D_1 = 0$ ,  $D_2 = 1$ , and  $D_3 = 0$  as shown. Develop the data-output waveform in relation to the inputs.



26. Draw the logic diagram for a modulus-18 Johnson counter. Show the timing diagram and write the sequence in tabular form.
27. For the ring counter in Figure 8–60, show the waveforms for each flip-flop output with respect to the clock. Assume that FF0 is initially SET and that the rest are RESET. Show at least ten clock pulses.

