Since this is the same as Table 12.20, then the state diagram is given in Fig. 12.46.

**Prob. 12.44**

**Transition K. Maps**

\[ Q_1 = Q_0 
\]

\[ Q_2 = \overline{Q_0} \]

\[ J_1 = \overline{Q_1} \]

\[ K_1 = Q_2 \]

\[ J_2 = Q_1 \]

\[ K_2 = 1 \]

**State:**

\[ Q_0, Q_1 \]

\[ J = d \]

\[ K = \overline{Q_0} \]

\[ C = 1 \]

\[ D = 0 \]

**Alternative analysis**

This network is simpler than the one given in Fig. 12.45.

\[ D_1 = Q_1 \]

\[ D_2 = Q_2 \]

\[ D_3 = Q_2 \]
Physics 116B Winter 2007 Problem Set 5 Solutions
From Instructor's Manual for Fundamentals of Electrical Engineering 2nd Ed. by Bobrow
© 1996 Oxford University Press

---

Special Problem 1
(a) State diagram

(b)(i) 5 states: 111 → 011 → 001 → 100 → 110 → 111...
(ii) yes.

Special problem 2:
Transition Karnaugh maps:

\[ J_A = C \overline{Q}_B \]
\[ K_A = C + \overline{Q}_B = \overline{CQ}_B \]
\[ J_B = C \overline{Q}_A \]
\[ K_B = CQ_A \]

---