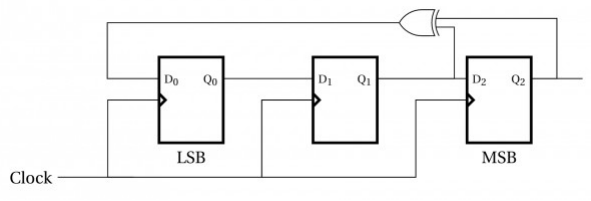

Which one of the following is correct state sequence of the circuit?

A. $1,3,4,6,7,5,2$
B. $1,2,5,3,7,6,4$
C. $1,2,7,3,5,6,4$
D. $1,6,5,7,2,3,4$

gatecse-2001 digital-logic normal synchronous-asynchronous-circuits

Answer key

6.29.4 Synchronous Asynchronous Circuits: GATE CSE 2003 | Question: 44

A 1-input, 2-output synchronous sequential circuit behaves as follows:

Let z_k, n_k denote the number of $0's$ and $1's$ respectively in initial k bits of the input $(z_k + n_k = k)$. The circuit outputs 00 until one of the following conditions holds.

- $z_k - n_k = 2$. In this case, the output at the k-th and all subsequent clock ticks is 10.
- $n_k - z_k = 2$. In this case, the output at the *k*-th and all subsequent clock ticks is 01.

What is the minimum number of states required in the state transition graph of the above circuit?

A. 5
B. 6
C. 7
D. 8

gatecse-2003 digital-logic synchronous-asynchronous-circuits normal

Answer key

Answer Keys

6.1.1	N/A	6.1.2	N/A	6.1.3	B	6.1.4	B	6.1.5	A
6.1.6	B	6.1.7	19.2	6.1.8	B	6.1.9	-1	6.2.1	B
6.2.2	C	6.3.1	D	6.3.2	C	6.3.3	N/A	6.3.4	N/A
6.3.5	N/A	6.3.6	D	6.3.7	N/A	6.3.8	A	6.3.9	B
6.3.10	D	6.3.11	C	6.3.12	D	6.3.13	C	6.3.14	C
6.3.15	D	6.3.16	D	6.3.17	D	6.3.18	A	6.3.19	A
6.3.20	D	6.3.21	D	6.3.22	D	6.3.23	1	6.3.24	A
6.3.25	C	6.3.26	C	6.3.27	D	6.3.28	B	6.3.29	B;C;D
6.3.30	B;C	6.3.31	B	6.3.32	C	6.4.1	N/A	6.4.2	A
6.4.3	B	6.4.4	A	6.4.5	C	6.4.6	B	6.5.1	A
6.5.2	A	6.5.3	C	6.5.4	A	6.5.5	3	6.5.6	A
6.5.7	3	6.5.8	B	6.5.9	C;D	6.6.1	A	6.6.2	B
6.7.1	B	6.7.2	N/A	6.7.3	C	6.7.4	N/A	6.7.5	N/A
6.7.6	A;C	6.7.7	B	6.7.8	B	6.7.9	B	6.7.10	011
6.7.11	D	6.7.12	C	6.7.13	N/A	6.7.14	N/A	6.7.15	B
6.7.16	B	6.7.17	A	6.7.18	A	6.7.19	A	6.7.20	D
6.7.21	A	6.7.22	A	6.7.23	D	6.7.24	A	6.7.25	C
6.7.26	C	6.7.27	C	6.7.28	A	6.7.29	A	6.7.30	B
6.7.31	D	6.7.32	B	6.7.33	C	6.7.34	C	6.7.35	X

6.7.36	D	6.7.37	C	6.7.38	A	6.7.39	D	6.8.1	C
6.8.2	A;C	6.9.1	C	6.9.2	1034	6.9.3	B	6.10.1	N/A
6.10.2	N/A	6.10.3	D	6.10.4	D	6.10.5	A	6.10.6	C
6.11.1	C	6.11.2	N/A	6.11.3	N/A	6.11.4	33.33	6.11.5	N/A
6.11.6	N/A	6.11.7	A	6.11.8	C	6.11.9	D	6.11.10	3
6.11.11	4	6.11.12	B	6.11.13	A	6.11.14	A	6.11.15	D
6.11.16	D	6.11.17	N/A	6.12.1	True	6.12.2	B	6.12.3	B
6.12.4	A	6.13.1	D	6.13.2	C	6.14.1	N/A	6.14.2	C
6.14.3	A	6.14.4	B	6.14.5	2	6.14.6	D	6.15.1	C
6.15.2	N/A	6.15.3	N/A	6.15.4	N/A	6.15.5	N/A	6.15.6	C
6.15.7	D	6.15.8	D	6.16.1	N/A	6.16.2	B;C	6.16.3	N/A
6.16.4	N/A	6.16.5	B;C	6.16.6	B	6.16.7	A	6.17.1	D
6.17.2	B	6.17.3	A	6.17.4	C	6.17.5	B	6.17.6	-7.75 : -7.75
6.17.7	C	6.17.8	B	6.17.9	C	6.17.10	B	6.17.11	C
6.18.1	D	6.18.2	N/A	6.18.3	N/A	6.18.4	N/A	6.18.5	N/A
6.18.6	C	6.18.7	C	6.18.8	B	6.18.9	D	6.18.10	A
6.18.11	B	6.18.12	C	6.18.13	A	6.18.14	B	6.18.15	1
6.18.16	A	6.18.17	D	6.18.18	A	6.18.19	C	6.19.1	C
6.19.2	C	6.19.3	B	6.19.4	C	6.20.1	N/A	6.20.2	B
6.20.3	B	6.20.4	B	6.21.1	N/A	6.21.2	A	6.22.1	N/A
6.22.2	N/A	6.22.3	9	6.22.4	N/A	6.22.5	A	6.22.6	B
6.22.7	B	6.22.8	A	6.22.9	A	6.22.10	B	6.22.11	3
6.22.12	6 : 6	6.22.13	A;B	6.22.14	A	6.23.1	N/A	6.23.2	C
6.23.3	C	6.23.4	A	6.23.5	C	6.23.6	D	6.23.7	5
6.23.8	A	6.23.9	B	6.23.10	C	6.23.11	4	6.23.12	D
6.23.13	A	6.23.14	N/A	6.24.1	12	6.24.2	N/A	6.24.3	9
6.24.4	N/A	6.24.5	N/A	6.24.6	N/A	6.24.7	N/A	6.24.8	N/A
6.24.9	C	6.24.10	D	6.24.11	C	6.24.12	D	6.24.13	C
6.24.14	A;C	6.24.15	C	6.24.16	B	6.24.17	C	6.24.18	B
6.24.19	D	6.24.20	D	6.24.21	B	6.24.22	N/A	6.24.23	A
6.24.24	D	6.24.25	A	6.24.26	A	6.24.27	A	6.24.28	A
6.24.29	B	6.24.30	C	6.24.31	D	6.24.32	B	6.24.33	A
6.24.34	B	6.24.35	5	6.24.36	3	6.24.37	5	6.24.38	-11
6.24.39	1	6.24.40	C	6.24.41	D	6.24.42	0.502 : 0.504	6.24.43	C
6.24.44	C	6.24.45	A	6.24.46	3 : 3	6.24.47	A;D	6.24.48	B
6.24.49	110	6.24.50	B	6.24.51	A;B;D	6.24.52	B	6.24.53	A
6.24.54	A	6.24.55	C	6.24.56	A	6.24.57	B	6.25.1	C
6.25.2	A	6.26.1	N/A	6.26.2	D	6.26.3	D	6.26.4	B
6.27.1	D	6.27.2	N/A	6.28.1	D	6.29.1	B	6.29.2	N/A
6.29.3	B	6.29.4	A						