

$y_1, y_2=0.9, 0.8$

$y_3, y_4=-0.1, 0.5$

$y_5, y_6=0.3, 0.2$

$y_7, y_8=-2, -2$

$y_9, y_{10}=-2, 2$

$y_{11}, y_{12}=-1, -1$

$u_1/c_1(1) c_1(2)$

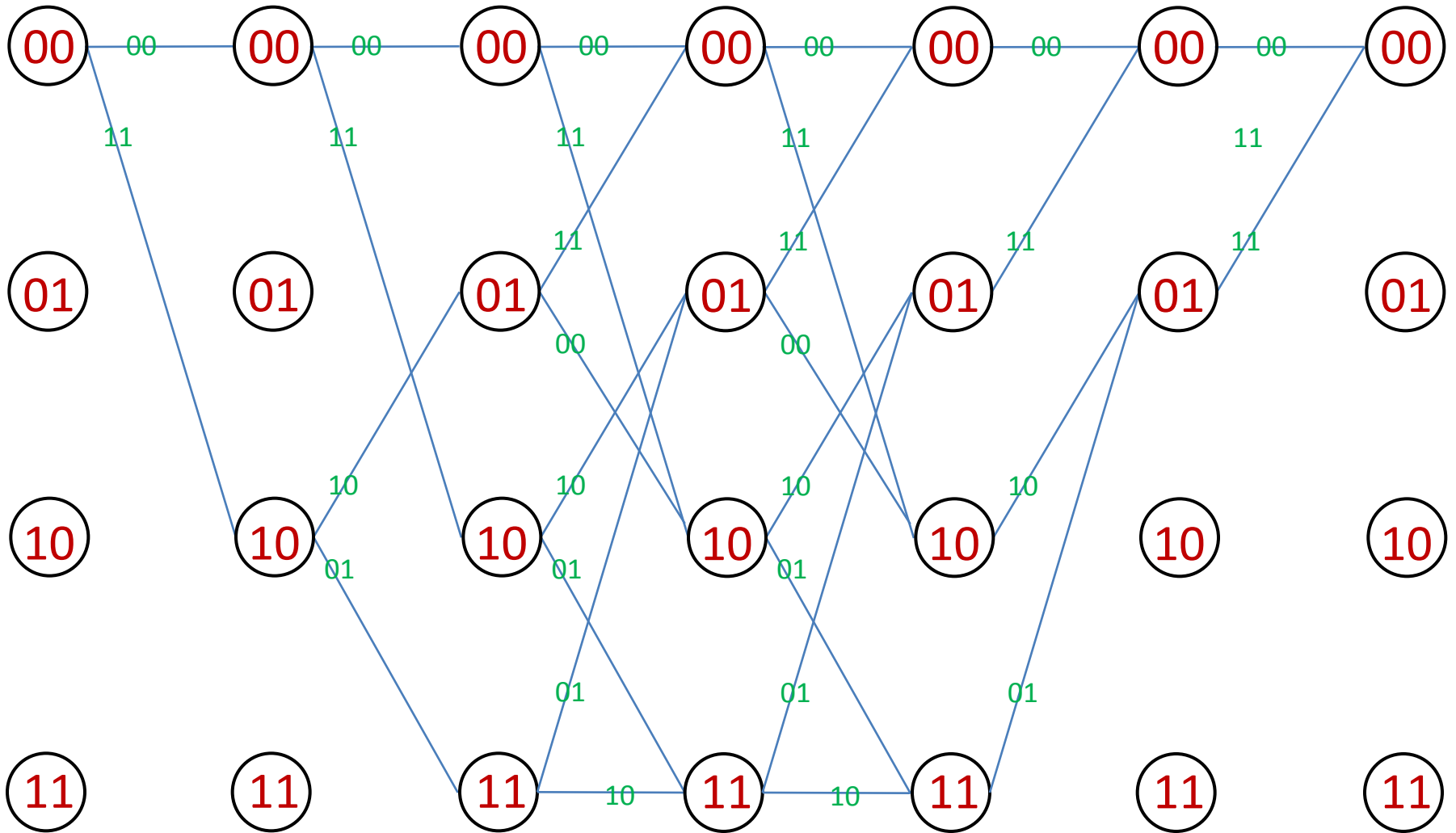
$u_2/c_2(1) c_2(2)$

$u_3/c_3(1) c_3(2)$

$u_4/c_4(1) c_4(2)$

$0/c_5(1) c_5(2)$

$0/c_6(1) c_6(2)$



$s[1]$

$s[2]$

$s[3]$

$s[4]$

$s[5]$

$s[6]$

$s[7]$

$y_1, y_2=0.9, 0.8$

$y_3, y_4=-0.1, 0.5$

$y_5, y_6=0.3, 0.2$

$y_7, y_8=-2, -2$

$y_9, y_{10}=-2, 2$

$y_{11}, y_{12}=-1, -1$

$u_1/c_1(1) c_1(2)$

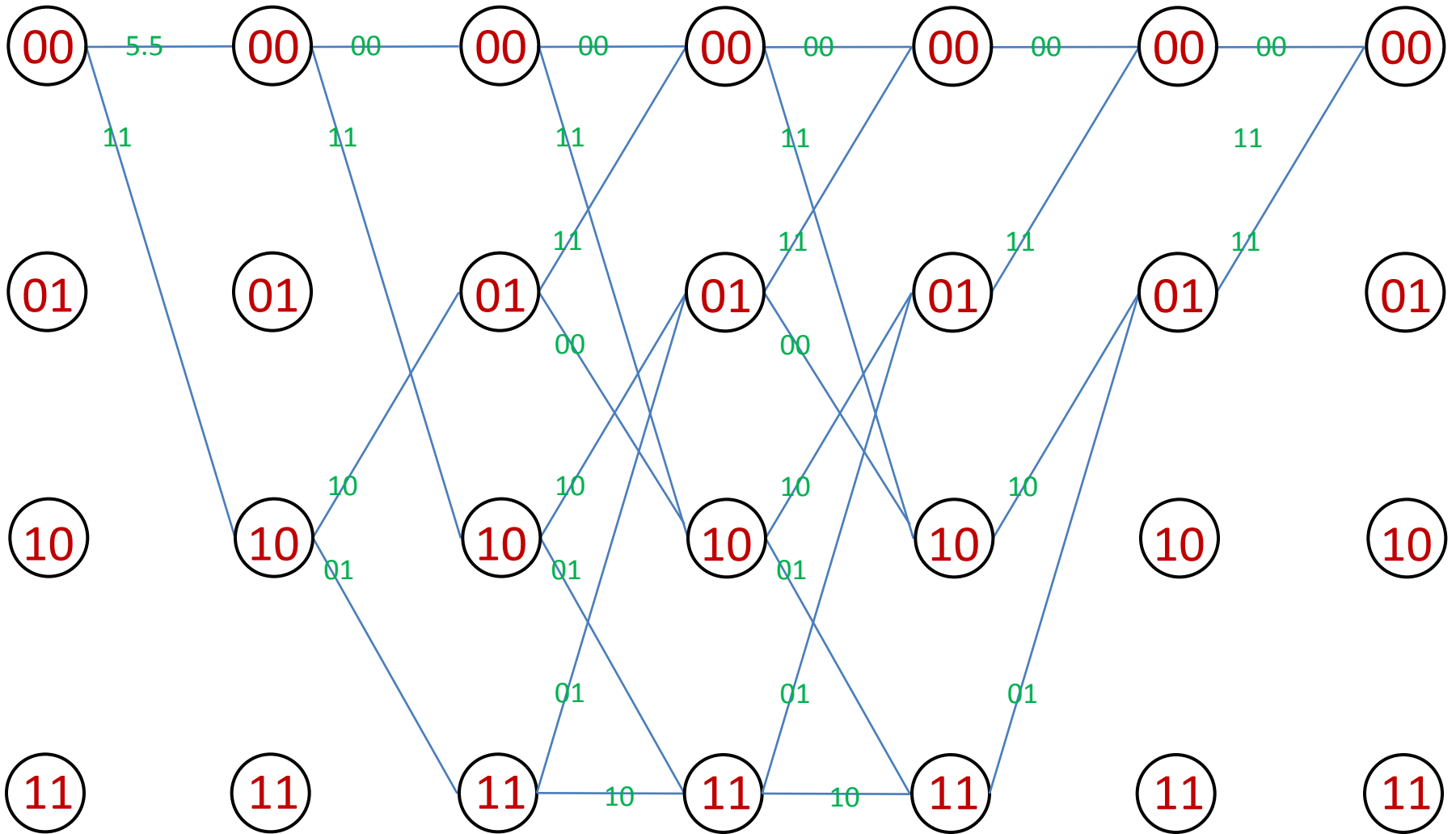
$u_2/c_2(1) c_2(2)$

$u_3/c_3(1) c_3(2)$

$u_4/c_4(1) c_4(2)$

$0/c_5(1) c_5(2)$

$0/c_6(1) c_6(2)$



s[1]

s[2]

s[3]

s[4]

s[5]

s[6]

s[7]

$\gamma_1, \gamma_2=0.9, 0.8$

$\gamma_3, \gamma_4=-0.1, 0.5$

$\gamma_5, \gamma_6=0.3, 0.2$

$\gamma_7, \gamma_8=-2, -2$

$\gamma_9, \gamma_{10}=-2, 2$

$\gamma_{11}, \gamma_{12}=-1, -1$

$u_1/c_1(1) c_1(2)$

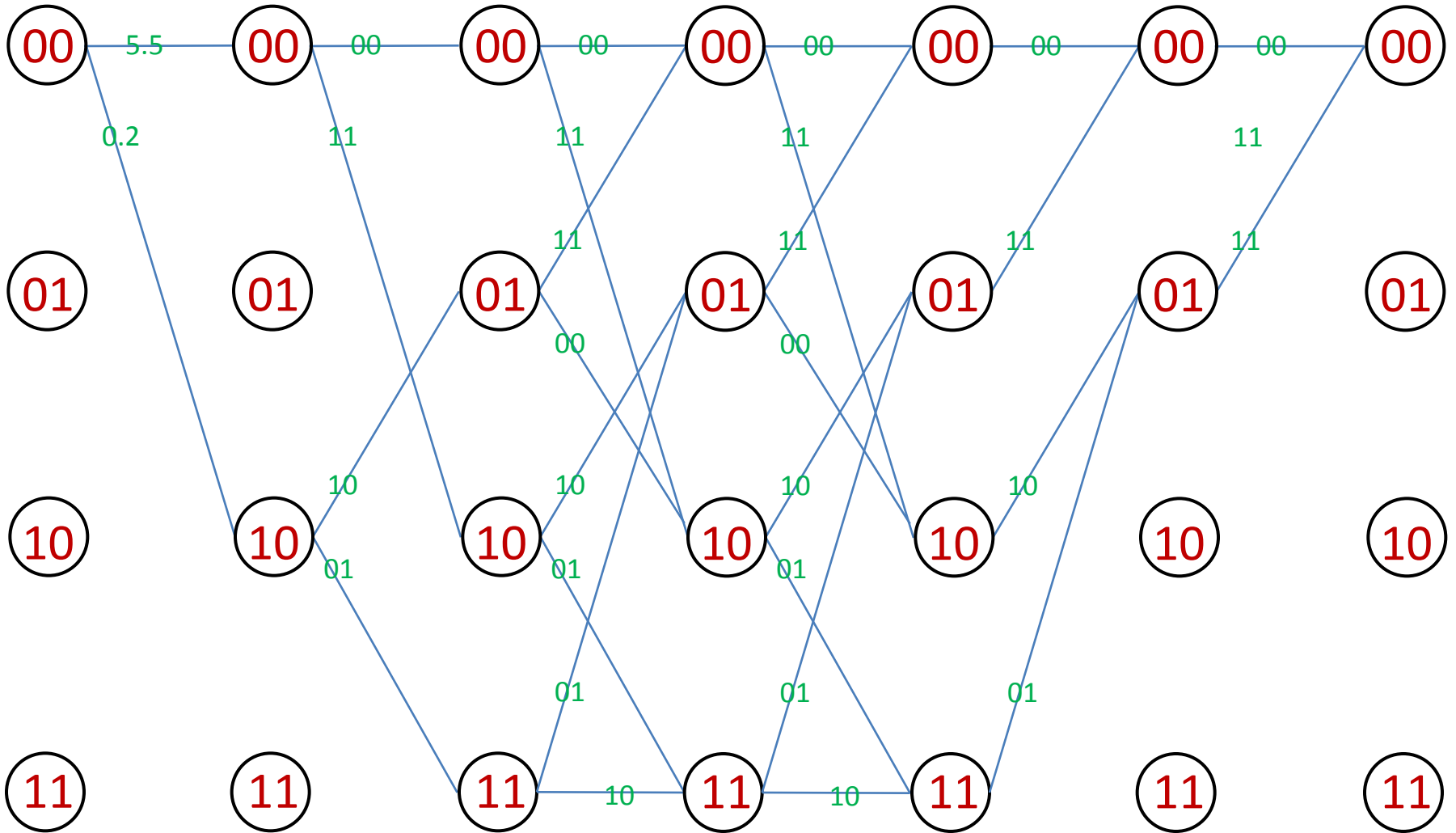
$u_2/c_2(1) c_2(2)$

$u_3/c_3(1) c_3(2)$

$u_4/c_4(1) c_4(2)$

$0/c_5(1) c_5(2)$

$0/c_6(1) c_6(2)$



$s[1]$

$s[2]$

$s[3]$

$s[4]$

$s[5]$

$s[6]$

$s[7]$

$\gamma_1, \gamma_2=0.9, 0.8$

$\gamma_3, \gamma_4=-0.1, 0.5$

$\gamma_5, \gamma_6=0.3, 0.2$

$\gamma_7, \gamma_8=-2, -2$

$\gamma_9, \gamma_{10}=-2, 2$

$\gamma_{11}, \gamma_{12}=-1, -1$

$u_1/c_1(1) c_1(2)$

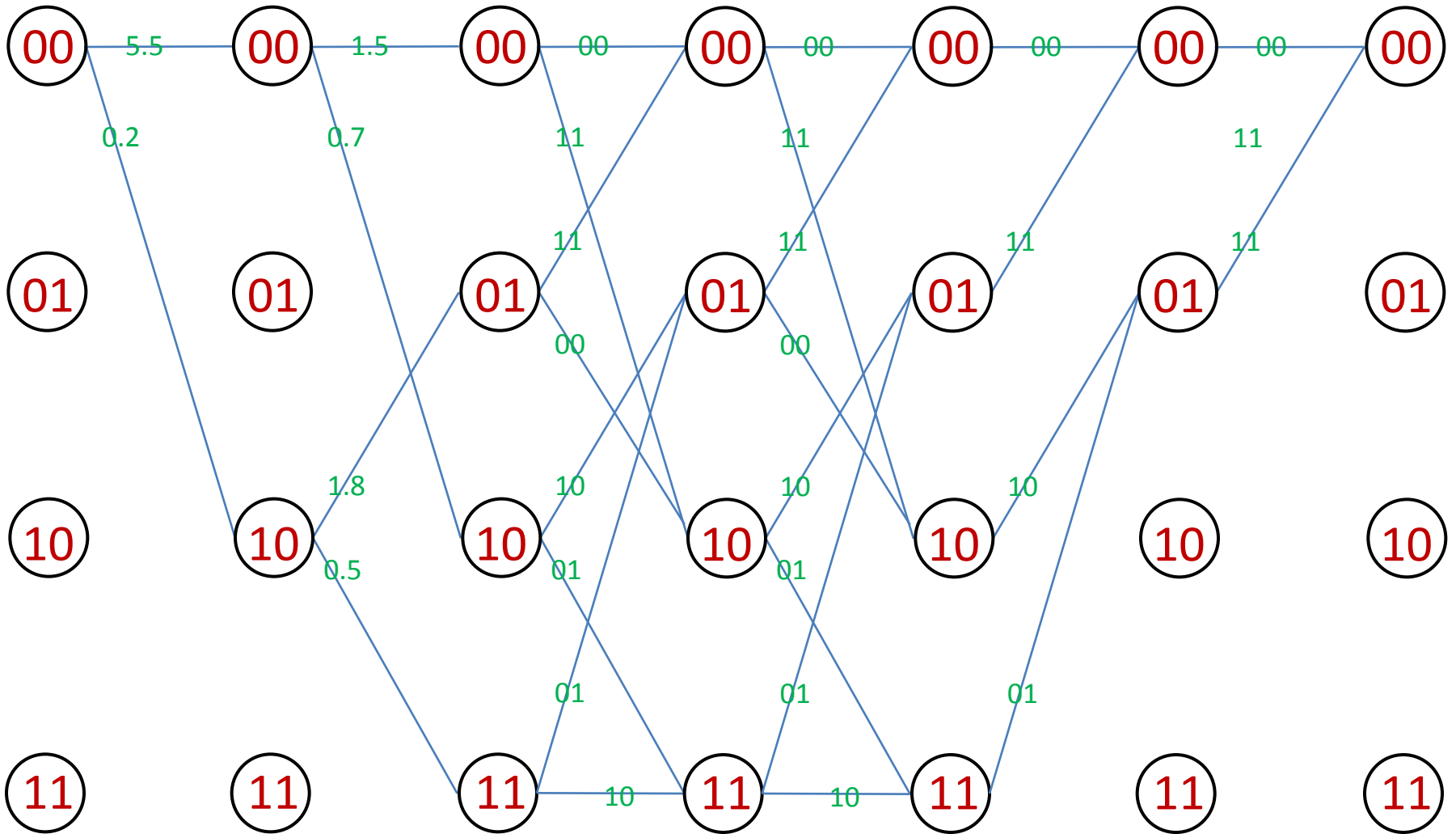
$u_2/c_2(1) c_2(2)$

$u_3/c_3(1) c_3(2)$

$u_4/c_4(1) c_4(2)$

$0/c_5(1) c_5(2)$

$0/c_6(1) c_6(2)$



$s[1]$

$s[2]$

$s[3]$

$s[4]$

$s[5]$

$s[6]$

$s[7]$

$y_1, y_2=0.9, 0.8$

$y_3, y_4=-0.1, 0.5$

$y_5, y_6=0.3, 0.2$

$y_7, y_8=-2, -2$

$y_9, y_{10}=-2, 2$

$y_{11}, y_{12}=-1, -1$

$u_1/c_1(1) c_1(2)$

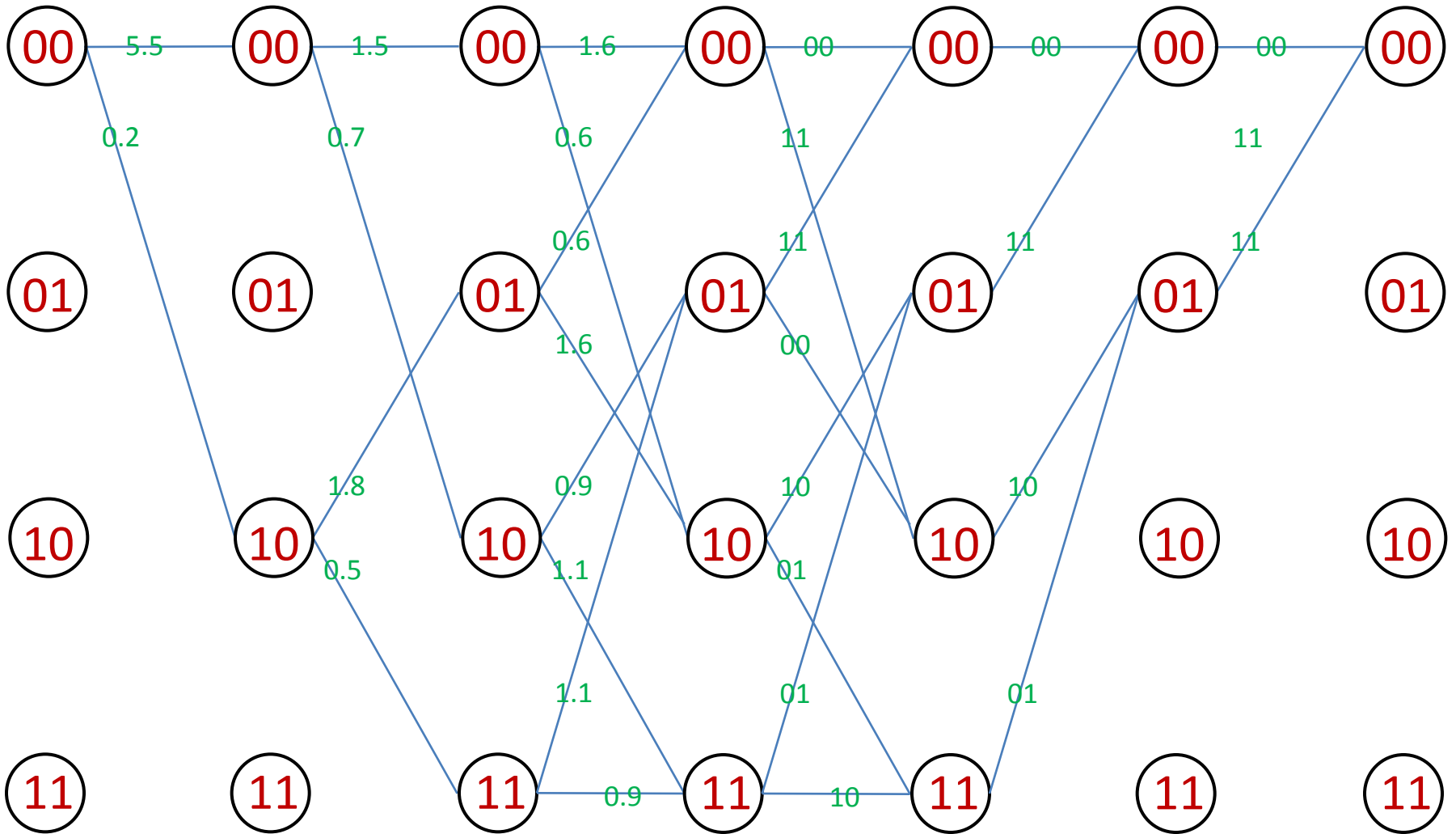
$u_2/c_2(1) c_2(2)$

$u_3/c_3(1) c_3(2)$

$u_4/c_4(1) c_4(2)$

$0/c_5(1) c_5(2)$

$0/c_6(1) c_6(2)$



s[1]

s[2]

s[3]

s[4]

s[5]

s[6]

s[7]

$\gamma_1, \gamma_2=0.9, 0.8$

$\gamma_3, \gamma_4=-0.1, 0.5$

$\gamma_5, \gamma_6=0.3, 0.2$

$\gamma_7, \gamma_8=-2, -2$

$\gamma_9, \gamma_{10}=-2, 2$

$\gamma_{11}, \gamma_{12}=-1, -1$

$u_1/c_1(1) c_1(2)$

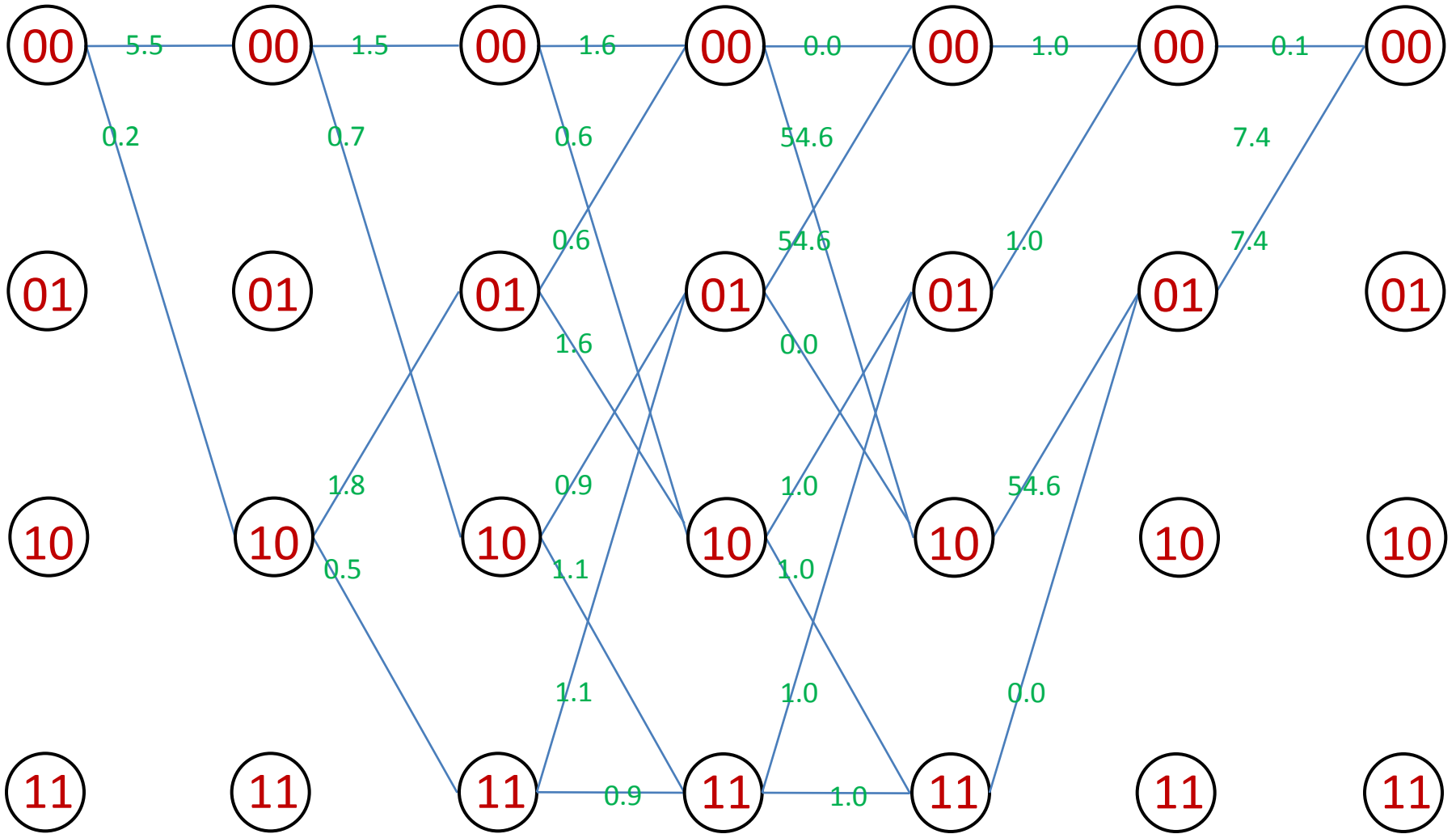
$u_2/c_2(1) c_2(2)$

$u_3/c_3(1) c_3(2)$

$u_4/c_4(1) c_4(2)$

$0/c_5(1) c_5(2)$

$0/c_6(1) c_6(2)$



s[1]

s[2]

s[3]

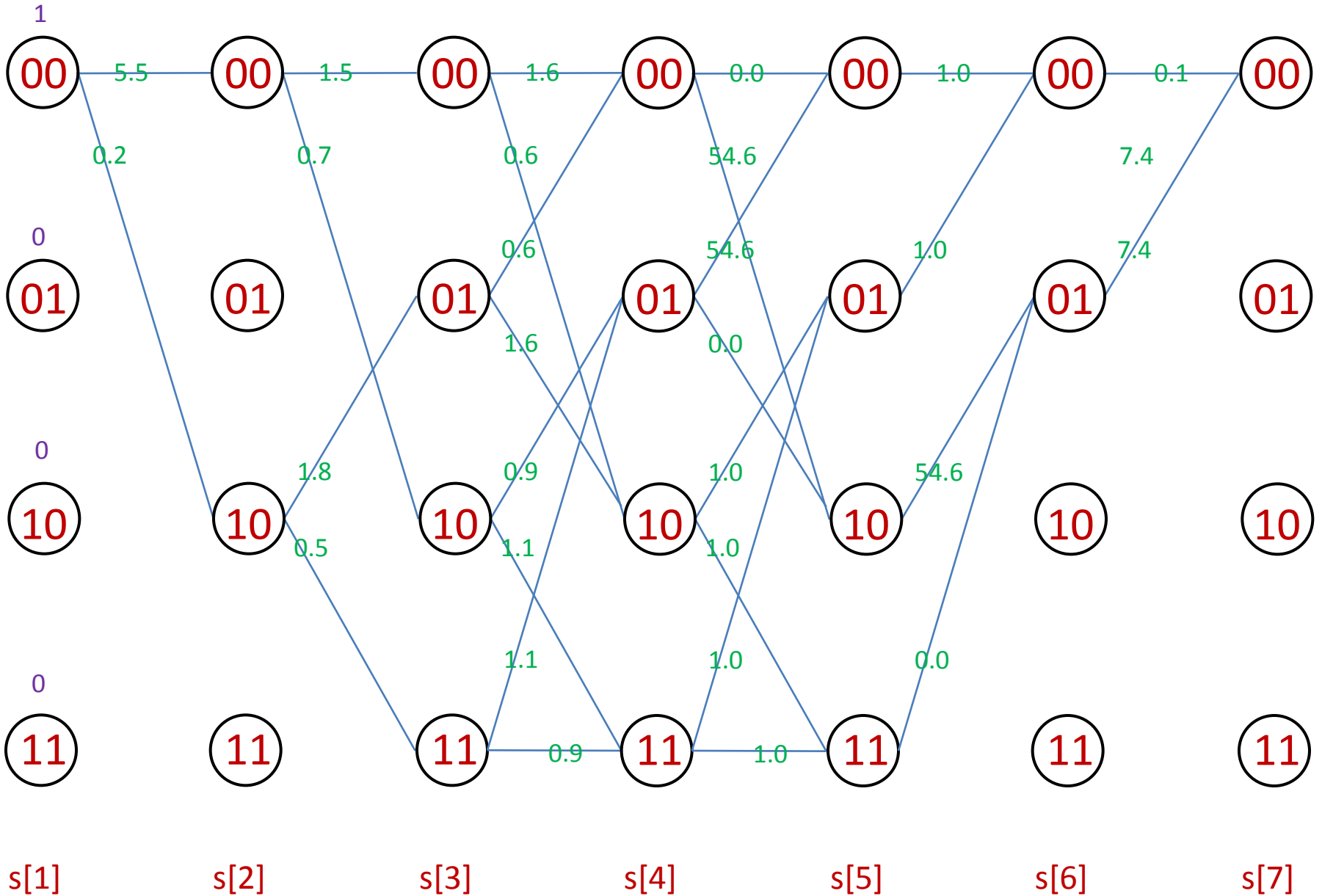
s[4]

s[5]

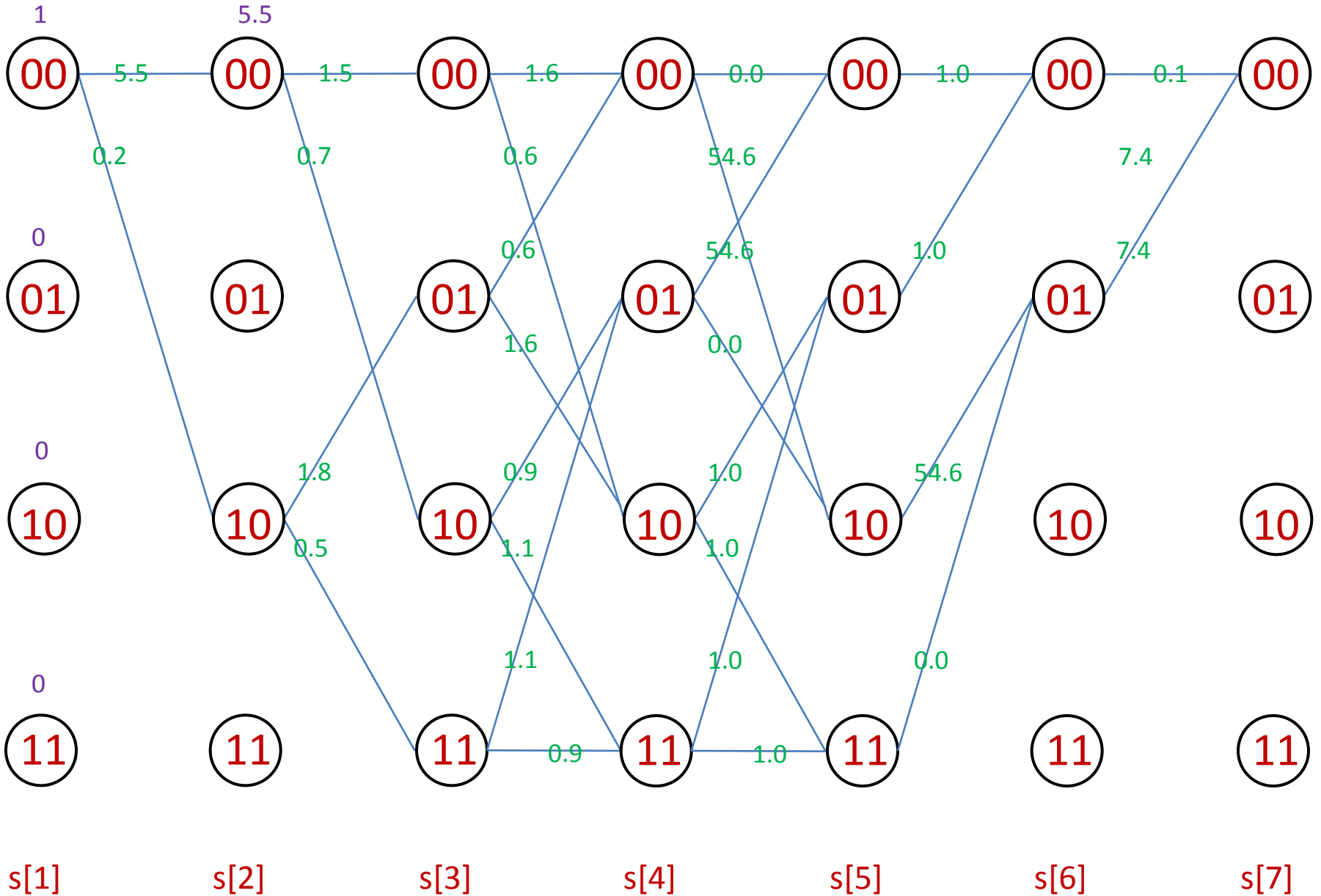
s[6]

s[7]

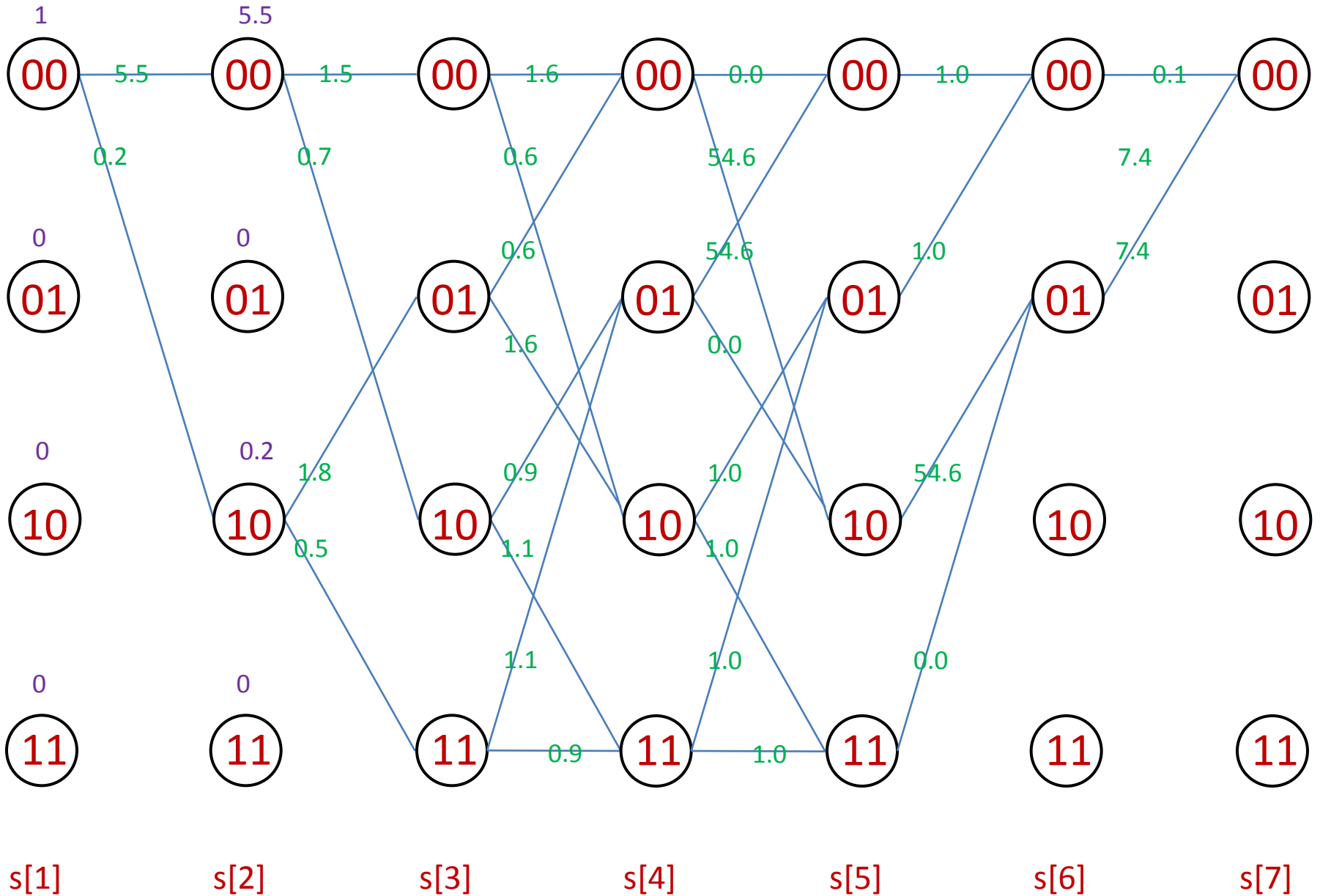
α_0 $\gamma_1, \gamma_2=0.9, 0.8$ $\gamma_3, \gamma_4=-0.1, 0.5$ $\gamma_5, \gamma_6=0.3, 0.2$ $\gamma_7, \gamma_8=-2, -2$ $\gamma_9, \gamma_{10}=-2, 2$ $\gamma_{11}, \gamma_{12}=-1, -1$
 $u_1/c_1(1) c_1(2)$ $u_2/c_2(1) c_2(2)$ $u_3/c_3(1) c_3(2)$ $u_4/c_4(1) c_4(2)$ $0/c_5(1) c_5(2)$ $0/c_6(1) c_6(2)$



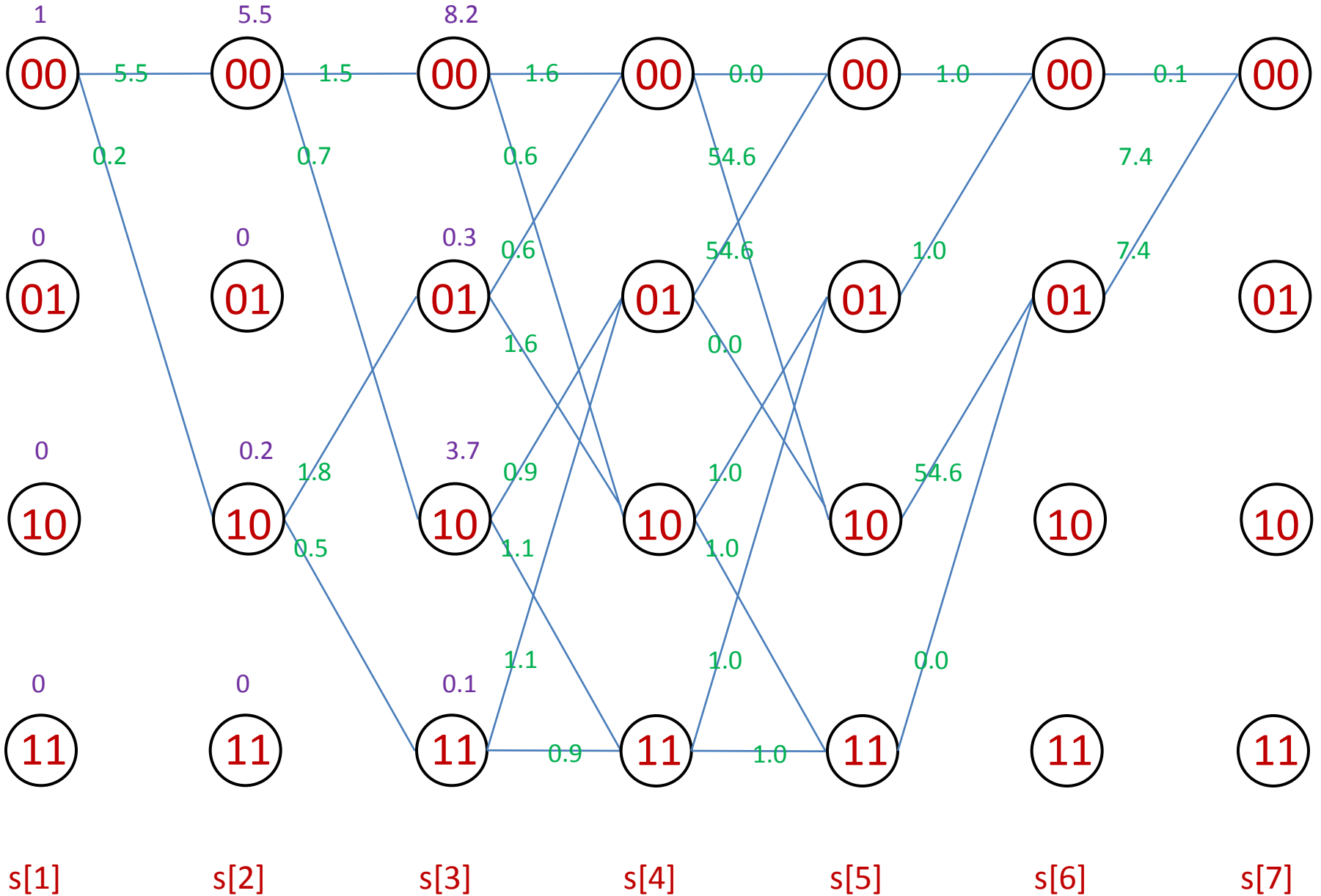
α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ $\gamma_5, \gamma_6=0.3, 0.2$ $\gamma_7, \gamma_8=-2, -2$ $\gamma_9, \gamma_{10}=-2, 2$ $\gamma_{11}, \gamma_{12}=-1, -1$
 $u_1/c_1(1) c_1(2)$ $u_2/c_2(1) c_2(2)$ $u_3/c_3(1) c_3(2)$ $u_4/c_4(1) c_4(2)$ $0/c_5(1) c_5(2)$ $0/c_6(1) c_6(2)$



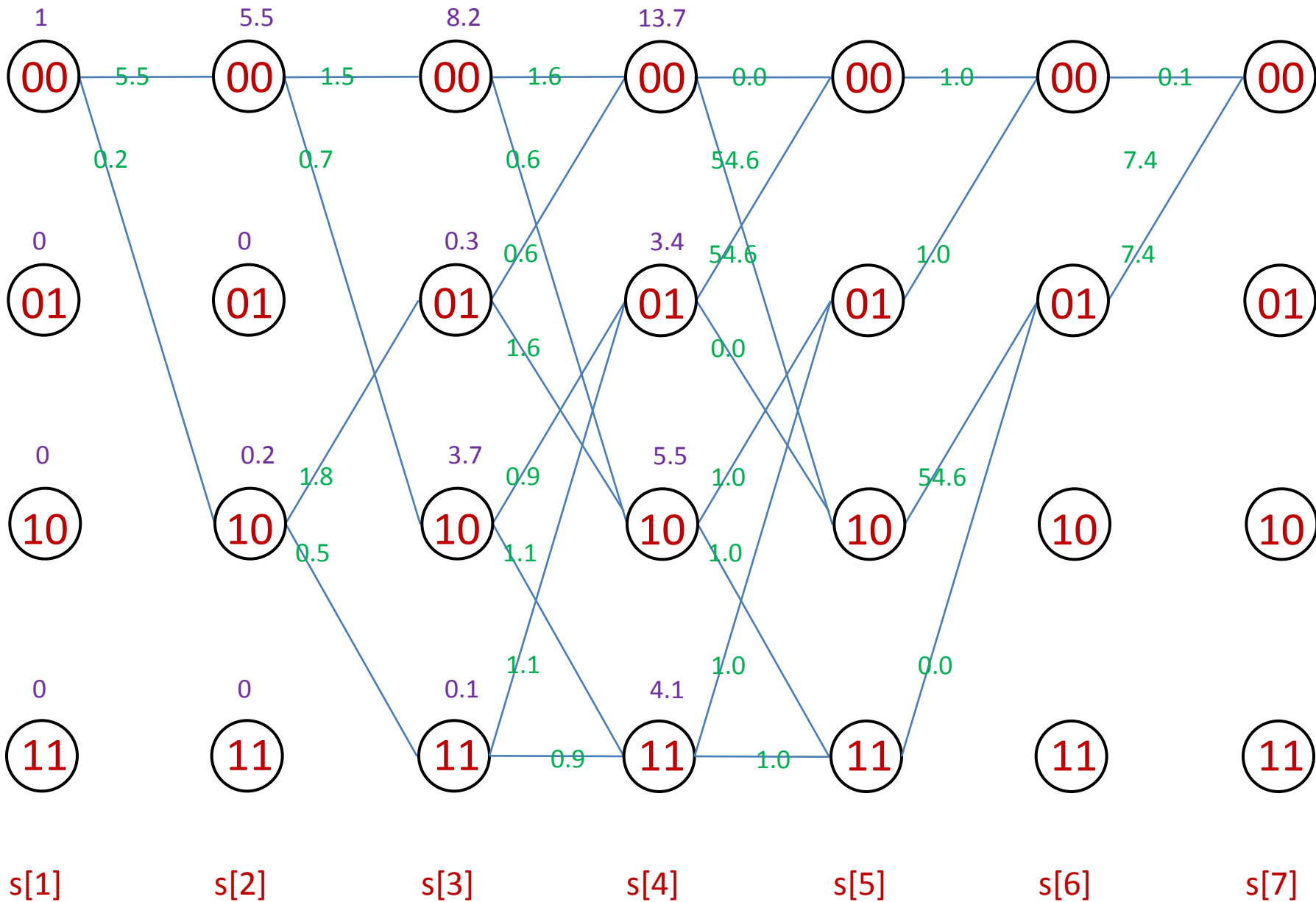
α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ $\gamma_5, \gamma_6=0.3, 0.2$ $\gamma_7, \gamma_8=-2, -2$ $\gamma_9, \gamma_{10}=-2, 2$ $\gamma_{11}, \gamma_{12}=-1, -1$
 $u_1/c_1(1) c_1(2)$ $u_2/c_2(1) c_2(2)$ $u_3/c_3(1) c_3(2)$ $u_4/c_4(1) c_4(2)$ $0/c_5(1) c_5(2)$ $0/c_6(1) c_6(2)$



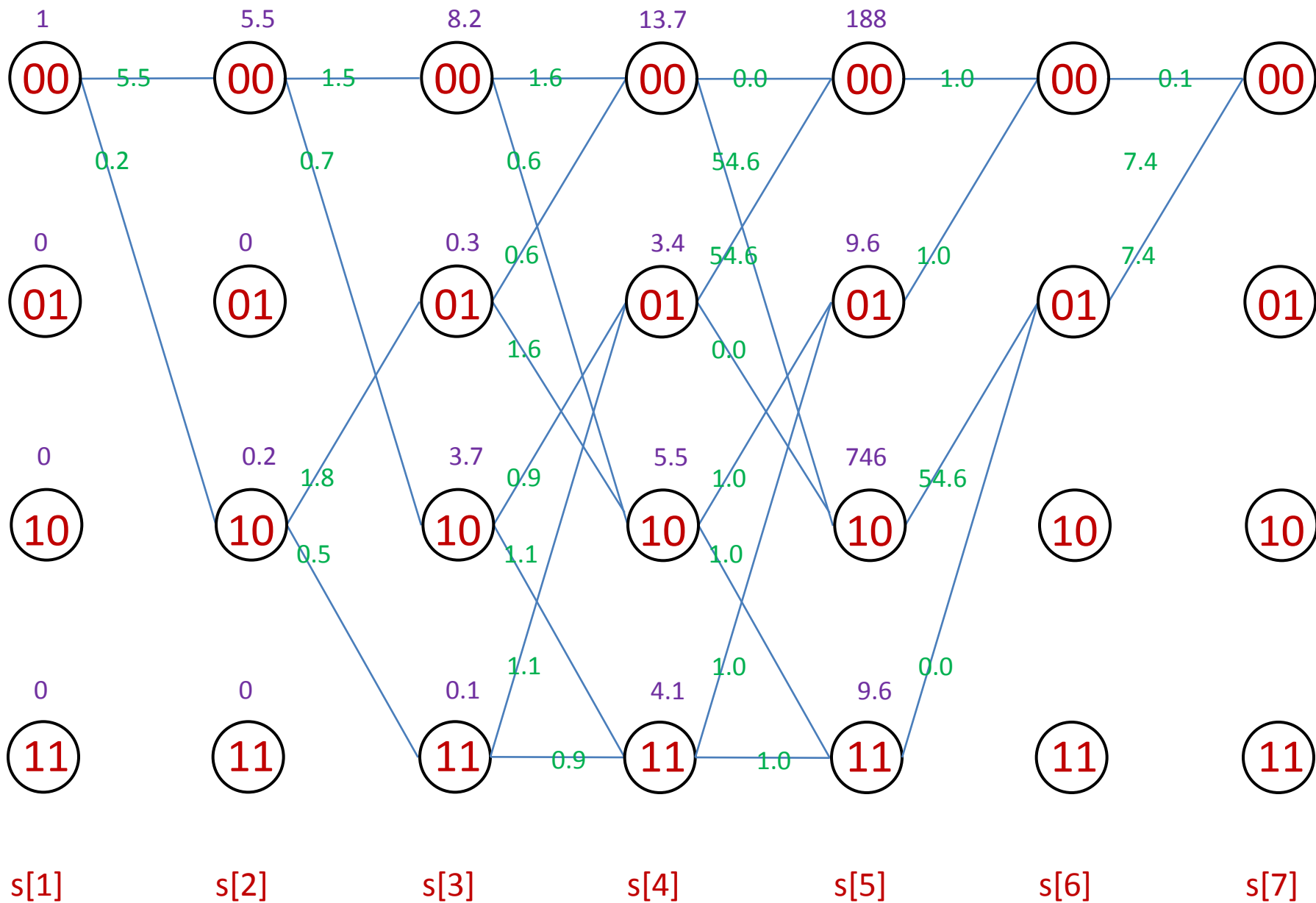
α_0 $\gamma_1, \gamma_2=0.9, 0.8$
 α_1 $\gamma_3, \gamma_4=-0.1, 0.5$
 α_2 $\gamma_5, \gamma_6=0.3, 0.2$
 $\gamma_7, \gamma_8=-2, -2$
 $\gamma_9, \gamma_{10}=-2, 2$
 $\gamma_{11}, \gamma_{12}=-1, -1$
 $u_1/c_1(1) c_1(2)$
 $u_2/c_2(1) c_2(2)$
 $u_3/c_3(1) c_3(2)$
 $u_4/c_4(1) c_4(2)$
 $0/c_5(1) c_5(2)$
 $0/c_6(1) c_6(2)$



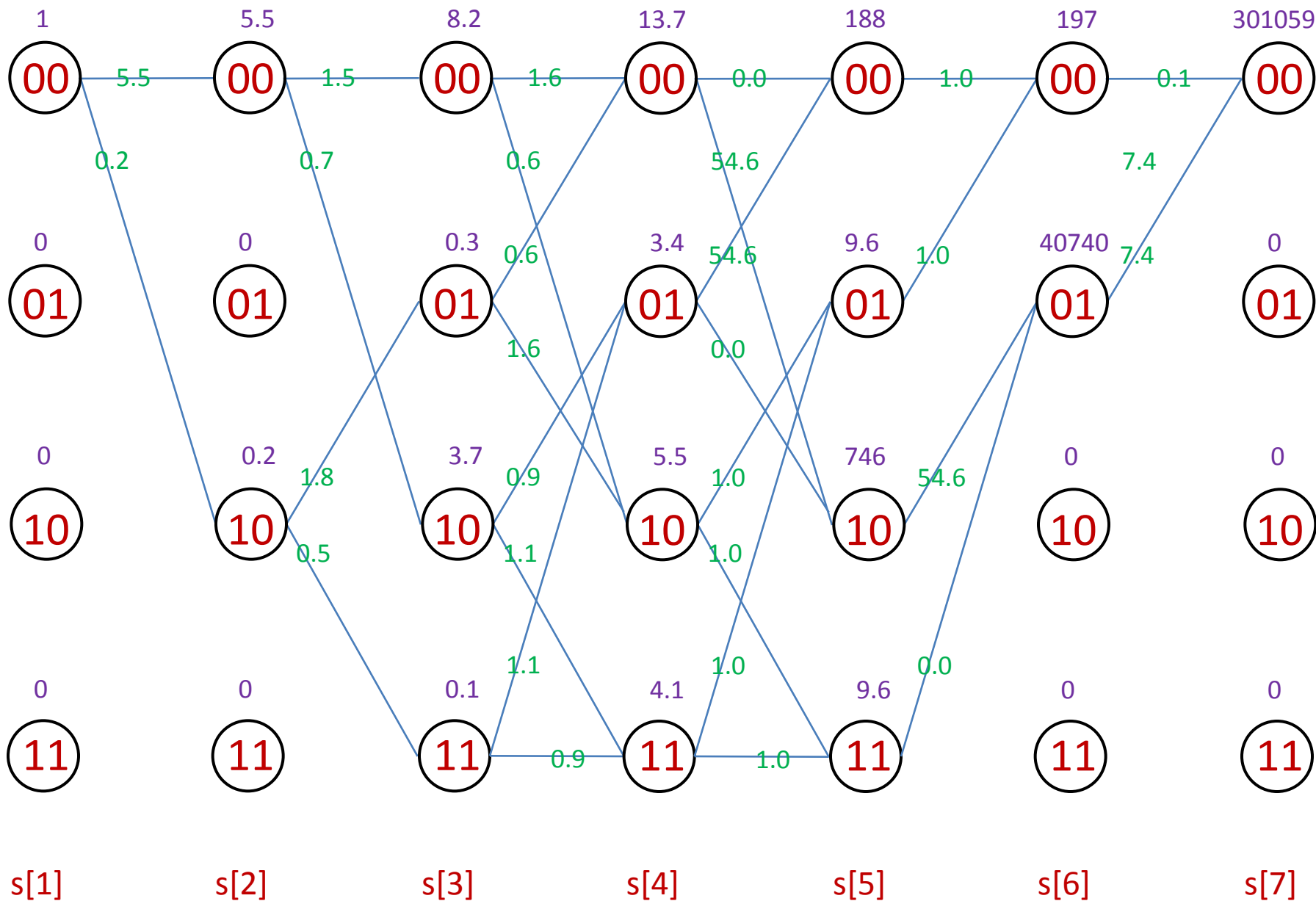
α_0 $\gamma_1, \gamma_2=0.9, 0.8$
 α_1 $\gamma_3, \gamma_4=-0.1, 0.5$
 α_2 $\gamma_5, \gamma_6=0.3, 0.2$
 α_3 $\gamma_7, \gamma_8=-2, -2$
 $\gamma_9, \gamma_{10}=-2, 2$
 $\gamma_{11}, \gamma_{12}=-1, -1$
 $u_1/c_1(1) c_1(2)$
 $u_2/c_2(1) c_2(2)$
 $u_3/c_3(1) c_3(2)$
 $u_4/c_4(1) c_4(2)$
 $0/c_5(1) c_5(2)$
 $0/c_6(1) c_6(2)$



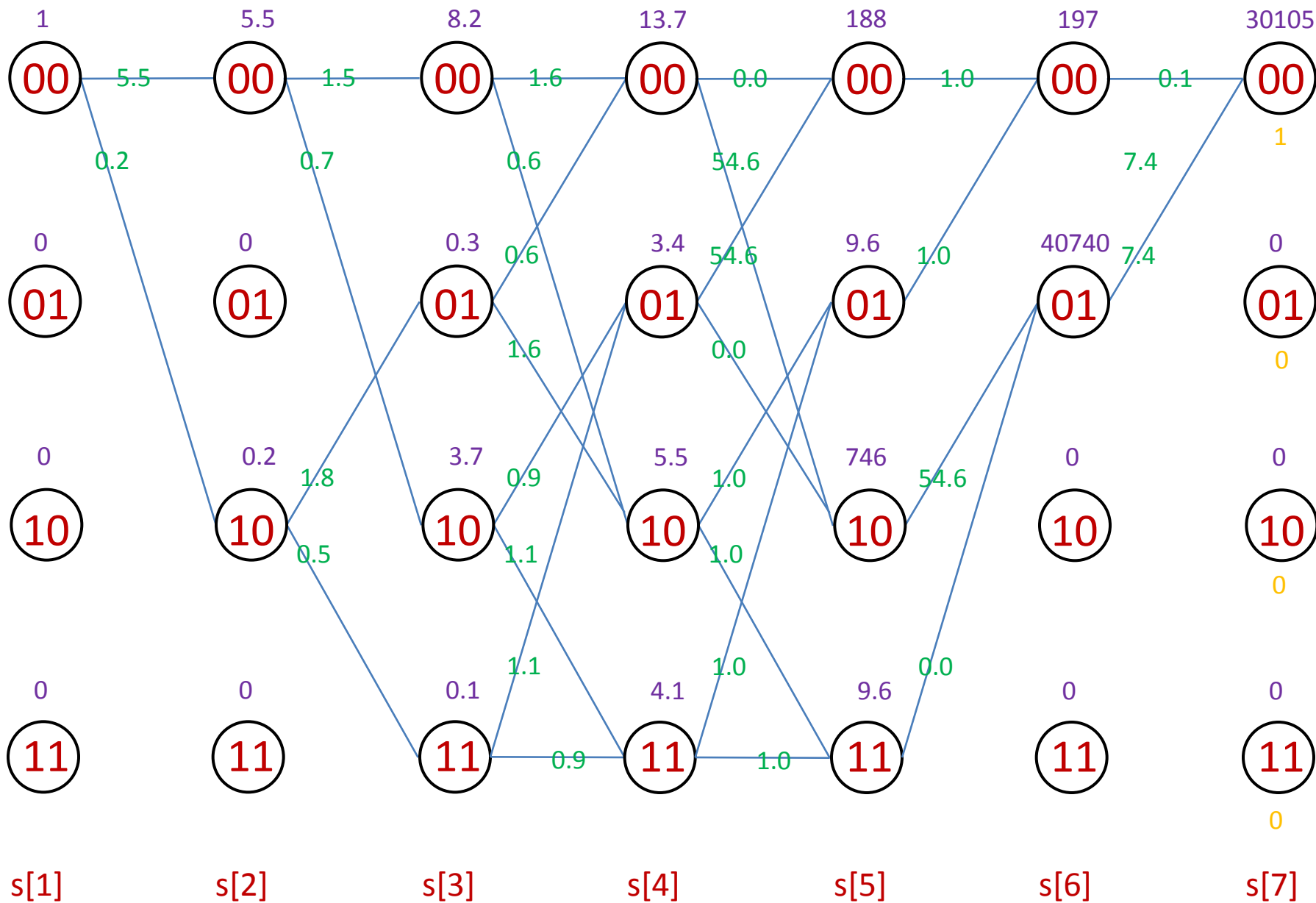
α_0 $\gamma_1, \gamma_2=0.9, 0.8$
 α_1 $\gamma_3, \gamma_4=-0.1, 0.5$
 α_2 $\gamma_5, \gamma_6=0.3, 0.2$
 α_3 $\gamma_7, \gamma_8=-2, -2$
 α_4 $\gamma_9, \gamma_{10}=-2, 2$
 $\gamma_{11}, \gamma_{12}=-1, -1$
 $u_1/c_1(1) c_1(2)$
 $u_2/c_2(1) c_2(2)$
 $u_3/c_3(1) c_3(2)$
 $u_4/c_4(1) c_4(2)$
 $0/c_5(1) c_5(2)$
 $0/c_6(1) c_6(2)$



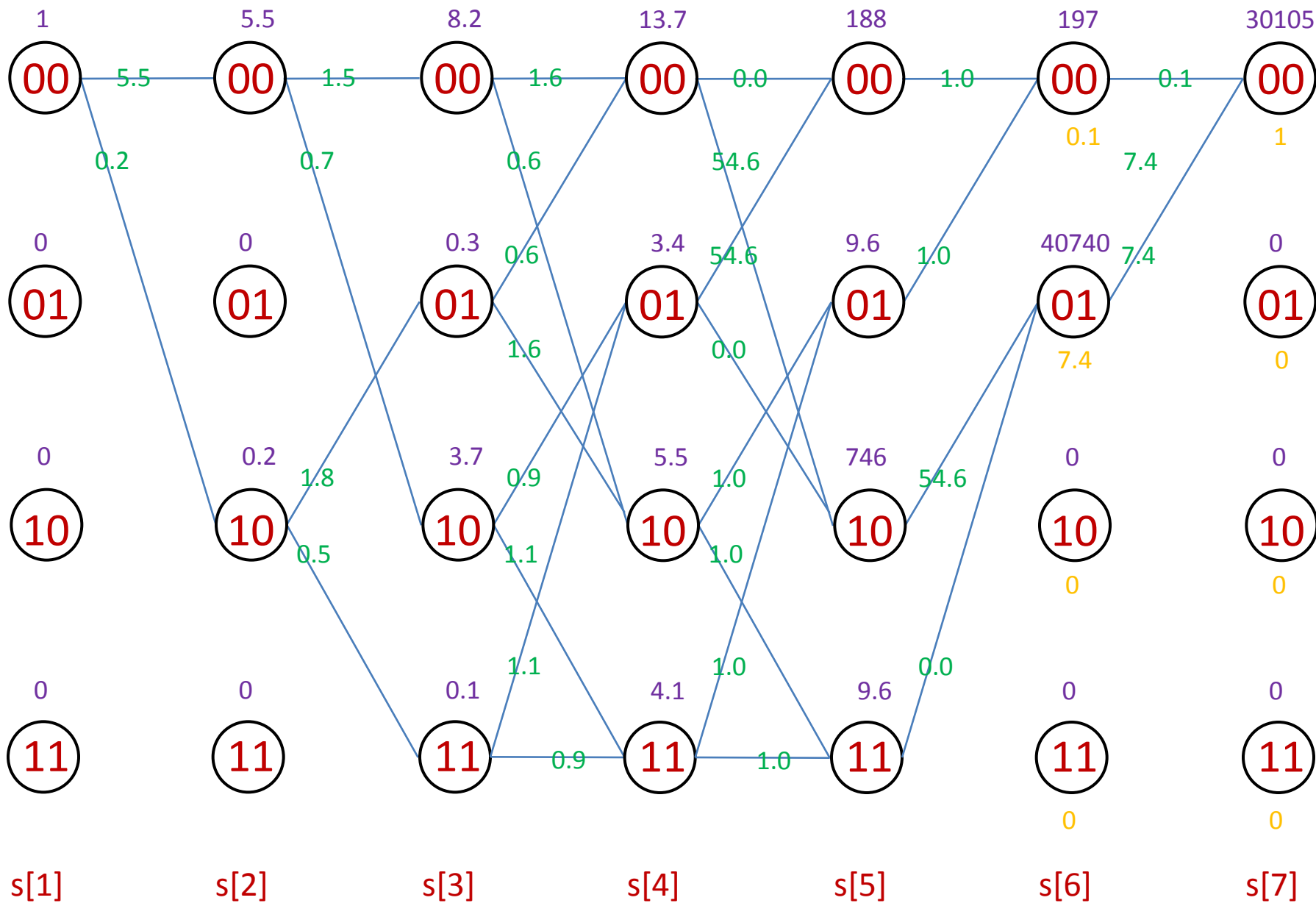
α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ α_2 $\gamma_5, \gamma_6=0.3, 0.2$ α_3 $\gamma_7, \gamma_8=-2, -2$ α_4 $\gamma_9, \gamma_{10}=-2, 2$ α_5 $\gamma_{11}, \gamma_{12}=-1, -1$ α_6
 $u_1/c_1(1) c_1(2)$ $u_2/c_2(1) c_2(2)$ $u_3/c_3(1) c_3(2)$ $u_4/c_4(1) c_4(2)$ $0/c_5(1) c_5(2)$ $0/c_6(1) c_6(2)$



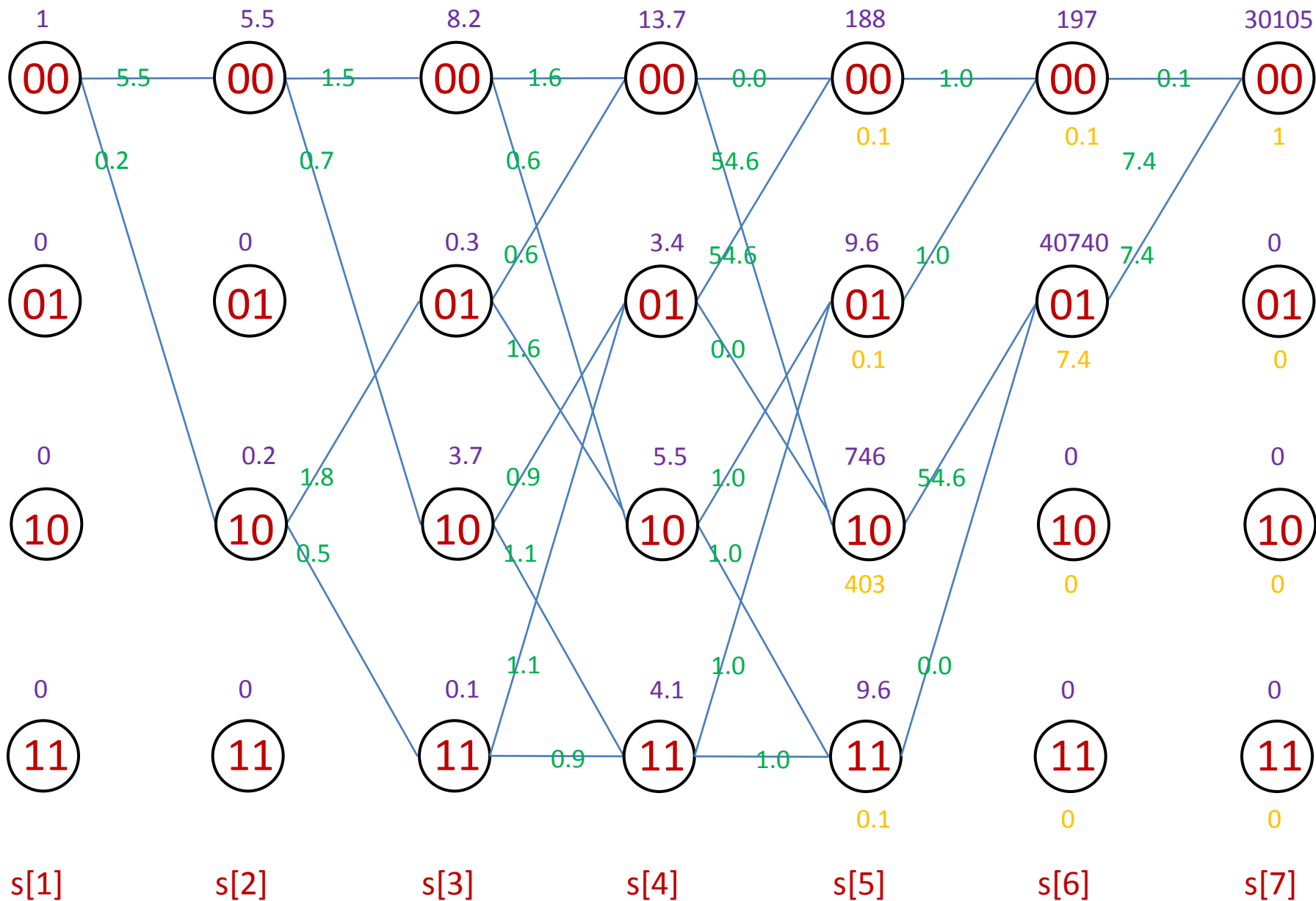
α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ α_2 $\gamma_5, \gamma_6=0.3, 0.2$ α_3 $\gamma_7, \gamma_8=-2, -2$ α_4 $\gamma_9, \gamma_{10}=-2, 2$ α_5 $\gamma_{11}, \gamma_{12}=-1, -1$ α_6
 $u_1/c_1(1) c_1(2)$ $u_2/c_2(1) c_2(2)$ $u_3/c_3(1) c_3(2)$ $u_4/c_4(1) c_4(2)$ $0/c_5(1) c_5(2)$ $0/c_6(1) c_6(2)$ β_6



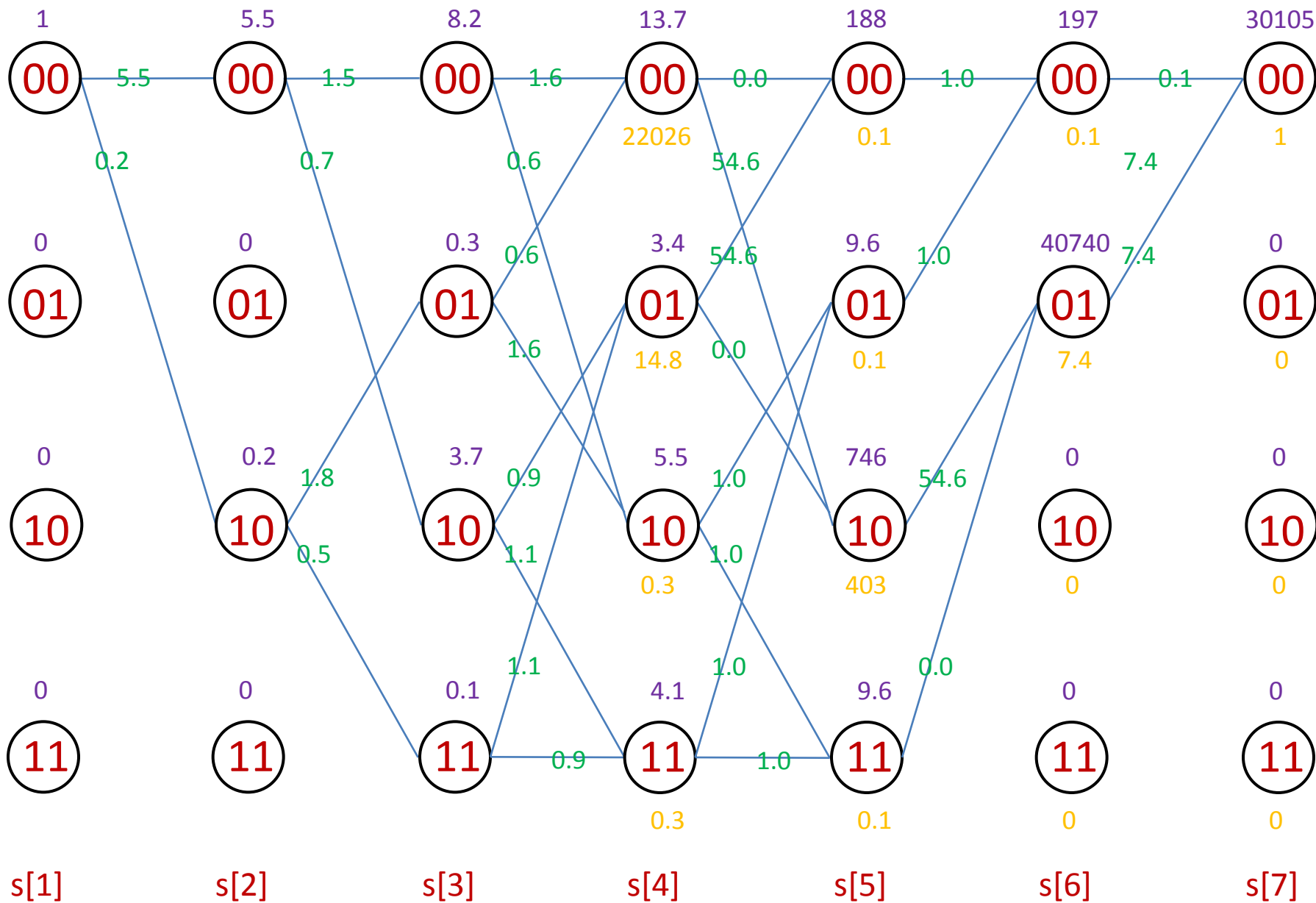
α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ α_2 $\gamma_5, \gamma_6=0.3, 0.2$ α_3 $\gamma_7, \gamma_8=-2, -2$ α_4 $\gamma_9, \gamma_{10}=-2, 2$ α_5 $\gamma_{11}, \gamma_{12}=-1, -1$ α_6
 $u_1/c_1(1) c_1(2)$ $u_2/c_2(1) c_2(2)$ $u_3/c_3(1) c_3(2)$ $u_4/c_4(1) c_4(2)$ $0/c_5(1) c_5(2)$ β_5 $0/c_6(1) c_6(2)$ β_6



α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ α_2 $\gamma_5, \gamma_6=0.3, 0.2$ α_3 $\gamma_7, \gamma_8=-2, -2$ α_4 $\gamma_9, \gamma_{10}=-2, 2$ α_5 $\gamma_{11}, \gamma_{12}=-1, -1$ α_6
 $u_1/c_1(1) c_1(2)$ $u_2/c_2(1) c_2(2)$ $u_3/c_3(1) c_3(2)$ $u_4/c_4(1) c_4(2)$ β_4 $0/c_5(1) c_5(2)$ β_5 $0/c_6(1) c_6(2)$ β_6

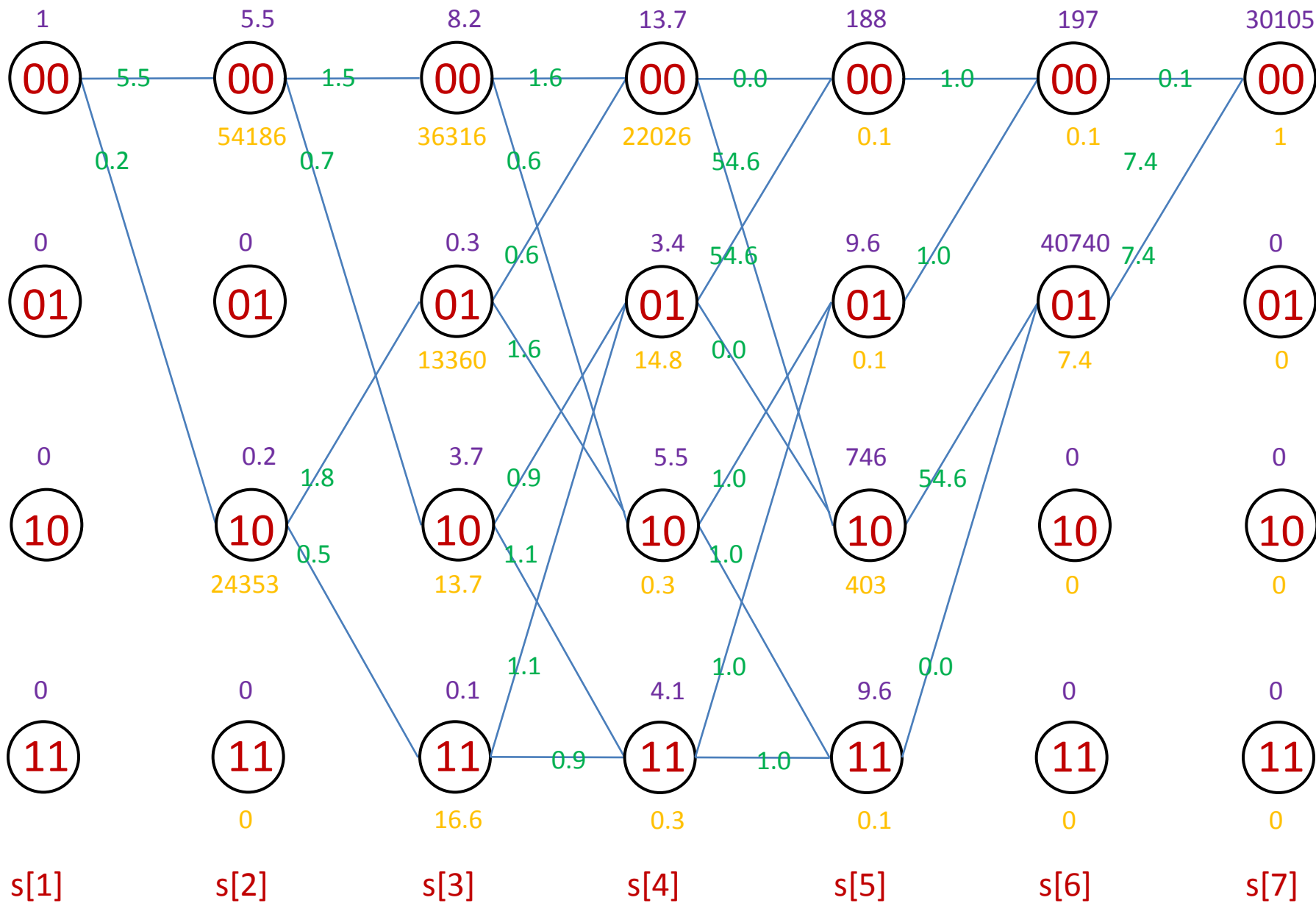


α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ α_2 $\gamma_5, \gamma_6=0.3, 0.2$ α_3 $\gamma_7, \gamma_8=-2, -2$ α_4 $\gamma_9, \gamma_{10}=-2, 2$ α_5 $\gamma_{11}, \gamma_{12}=-1, -1$ α_6
 $u_1/c_1(1) c_1(2)$ $u_2/c_2(1) c_2(2)$ $u_3/c_3(1) c_3(2)$ β_3 $u_4/c_4(1) c_4(2)$ β_4 $0/c_5(1) c_5(2)$ β_5 $0/c_6(1) c_6(2)$ β_6



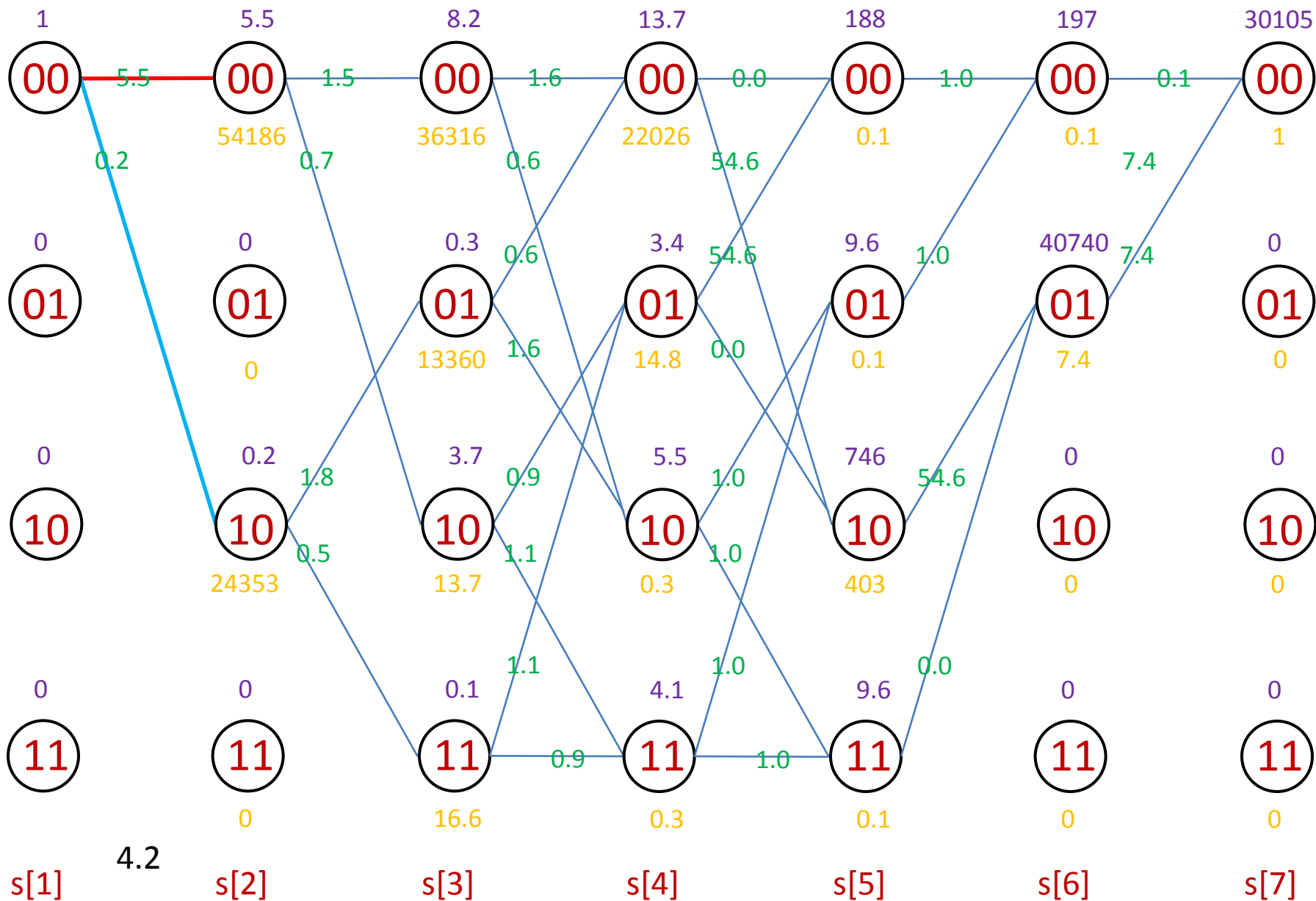
α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ α_2 $\gamma_5, \gamma_6=0.3, 0.2$ α_3 $\gamma_7, \gamma_8=-2, -2$ α_4 $\gamma_9, \gamma_{10}=-2, 2$ α_5 $\gamma_{11}, \gamma_{12}=-1, -1$ α_6

β_0 $u_1/c_1(1) c_1(2)$ β_1 $u_2/c_2(1) c_2(2)$ β_2 $u_3/c_3(1) c_3(2)$ β_3 $u_4/c_4(1) c_4(2)$ β_4 $0/c_5(1) c_5(2)$ β_5 $0/c_6(1) c_6(2)$ β_6



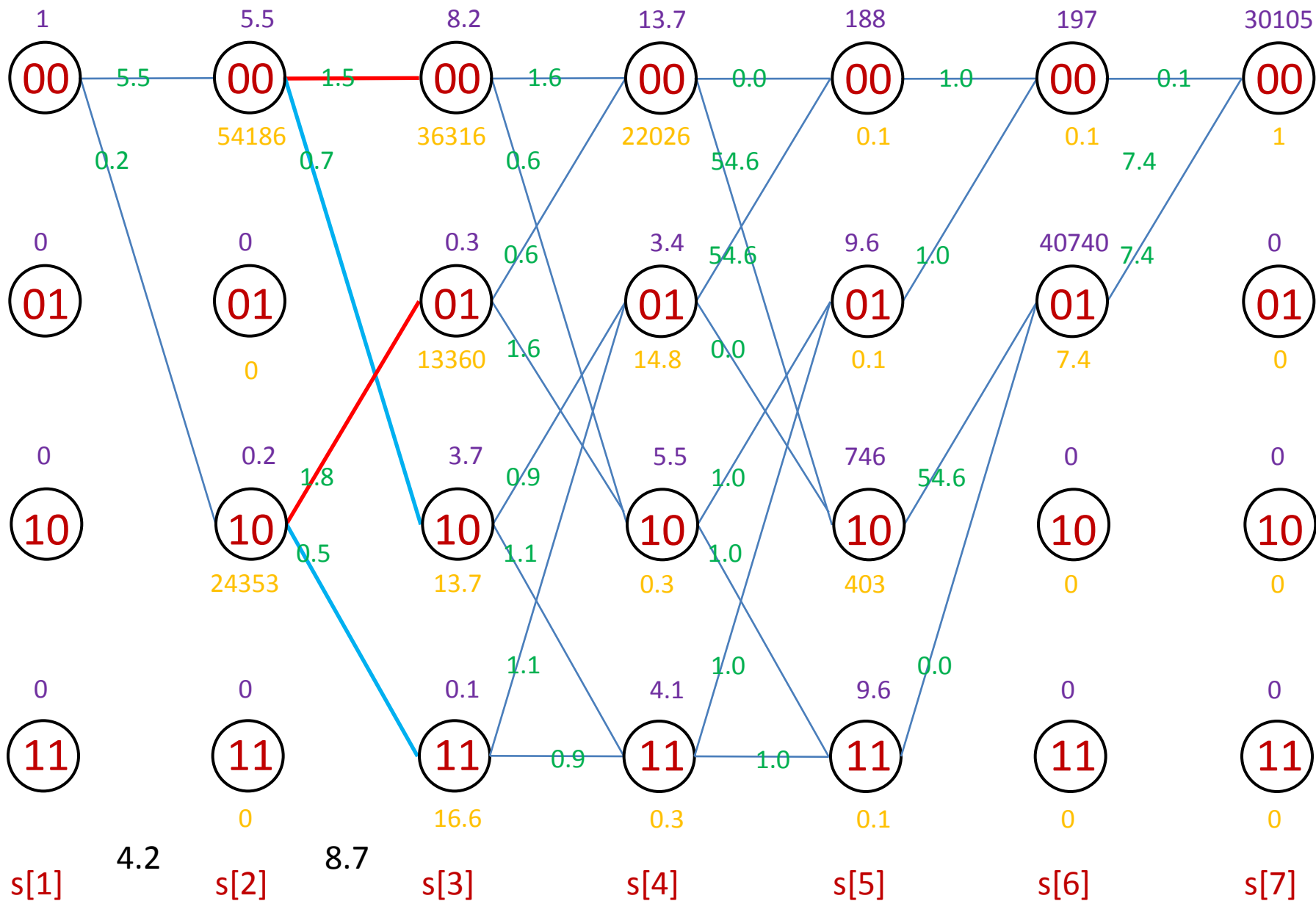
α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ α_2 $\gamma_5, \gamma_6=0.3, 0.2$ α_3 $\gamma_7, \gamma_8=-2, -2$ α_4 $\gamma_9, \gamma_{10}=-2, 2$ α_5 $\gamma_{11}, \gamma_{12}=-1, -1$ α_6

β_0 $u_1/c_1(1) c_1(2)$ β_1 $u_2/c_2(1) c_2(2)$ β_2 $u_3/c_3(1) c_3(2)$ β_3 $u_4/c_4(1) c_4(2)$ β_4 $0/c_5(1) c_5(2)$ β_5 $0/c_6(1) c_6(2)$ β_6



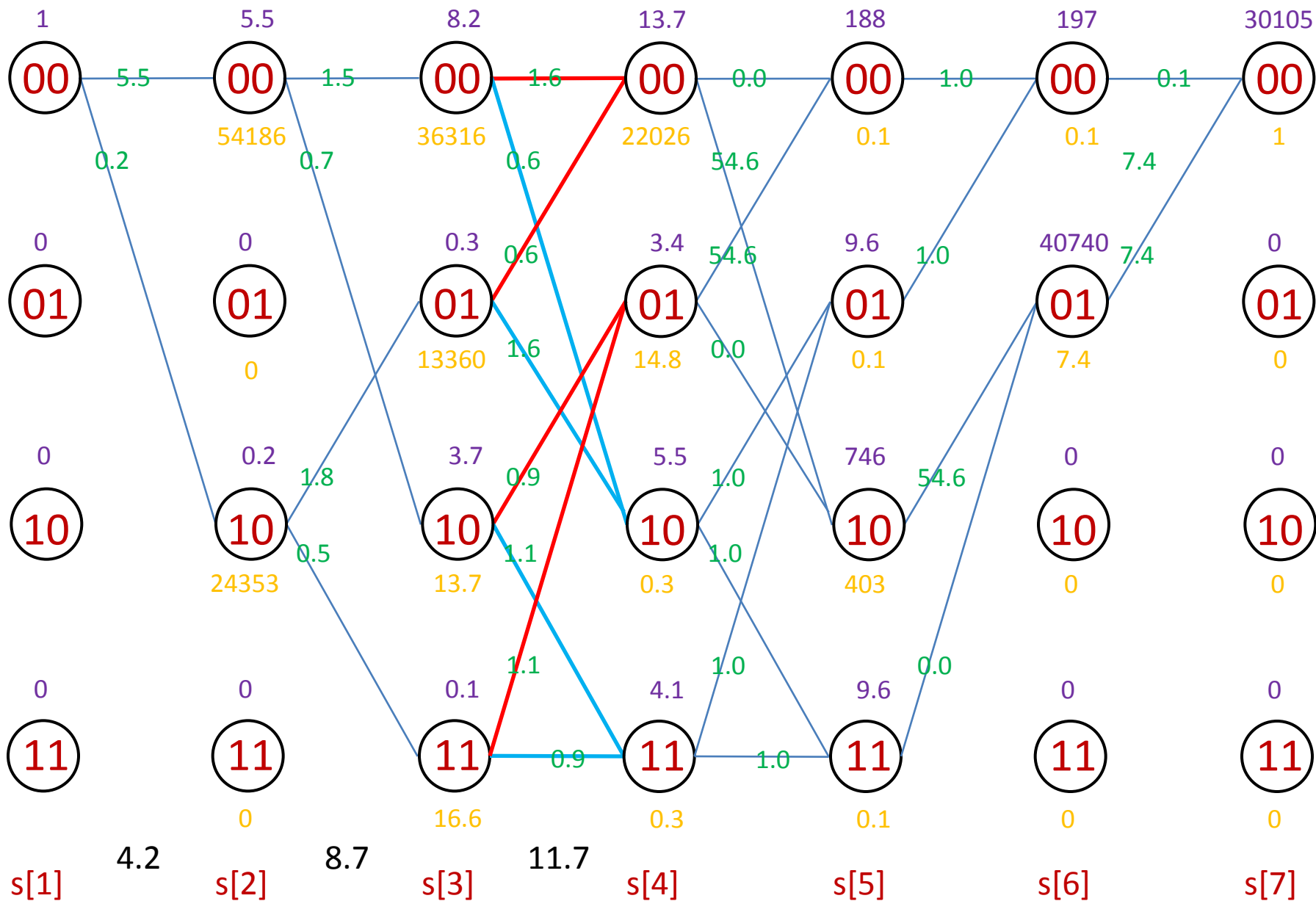
α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ α_2 $\gamma_5, \gamma_6=0.3, 0.2$ α_3 $\gamma_7, \gamma_8=-2, -2$ α_4 $\gamma_9, \gamma_{10}=-2, 2$ α_5 $\gamma_{11}, \gamma_{12}=-1, -1$ α_6

β_0 $u_1/c_1(1) c_1(2)$ β_1 $u_2/c_2(1) c_2(2)$ β_2 $u_3/c_3(1) c_3(2)$ β_3 $u_4/c_4(1) c_4(2)$ β_4 $0/c_5(1) c_5(2)$ β_5 $0/c_6(1) c_6(2)$ β_6



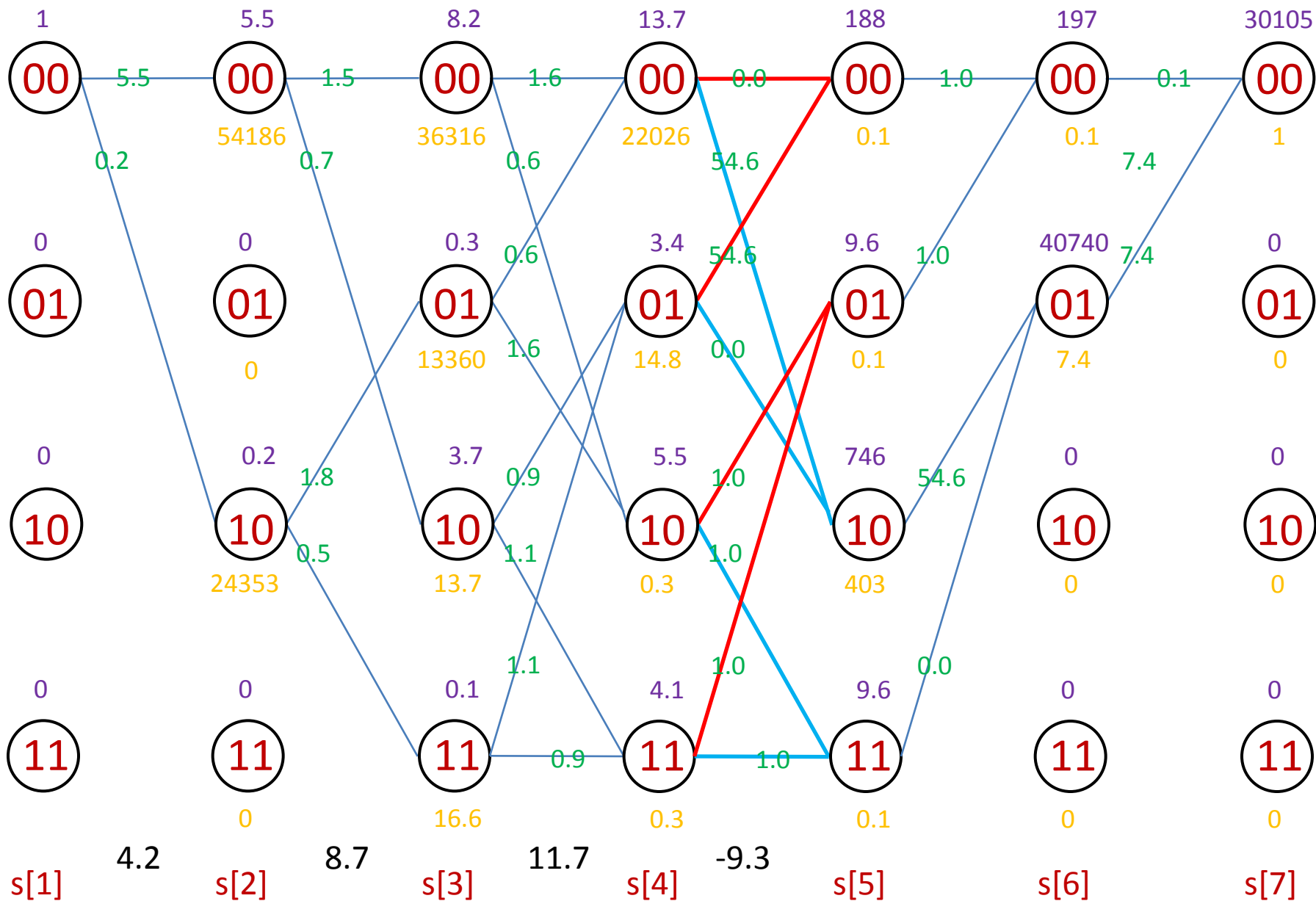
α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ α_2 $\gamma_5, \gamma_6=0.3, 0.2$ α_3 $\gamma_7, \gamma_8=-2, -2$ α_4 $\gamma_9, \gamma_{10}=-2, 2$ α_5 $\gamma_{11}, \gamma_{12}=-1, -1$ α_6

β_0 $u_1/c_1(1) c_1(2)$ β_1 $u_2/c_2(1) c_2(2)$ β_2 $u_3/c_3(1) c_3(2)$ β_3 $u_4/c_4(1) c_4(2)$ β_4 $0/c_5(1) c_5(2)$ β_5 $0/c_6(1) c_6(2)$ β_6



α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ α_2 $\gamma_5, \gamma_6=0.3, 0.2$ α_3 $\gamma_7, \gamma_8=-2, -2$ α_4 $\gamma_9, \gamma_{10}=-2, 2$ α_5 $\gamma_{11}, \gamma_{12}=-1, -1$ α_6

β_0 $u_1/c_1(1) c_1(2)$ β_1 $u_2/c_2(1) c_2(2)$ β_2 $u_3/c_3(1) c_3(2)$ β_3 $u_4/c_4(1) c_4(2)$ β_4 $0/c_5(1) c_5(2)$ β_5 $0/c_6(1) c_6(2)$ β_6



$z[0], z[1]=0.9, 0.8$

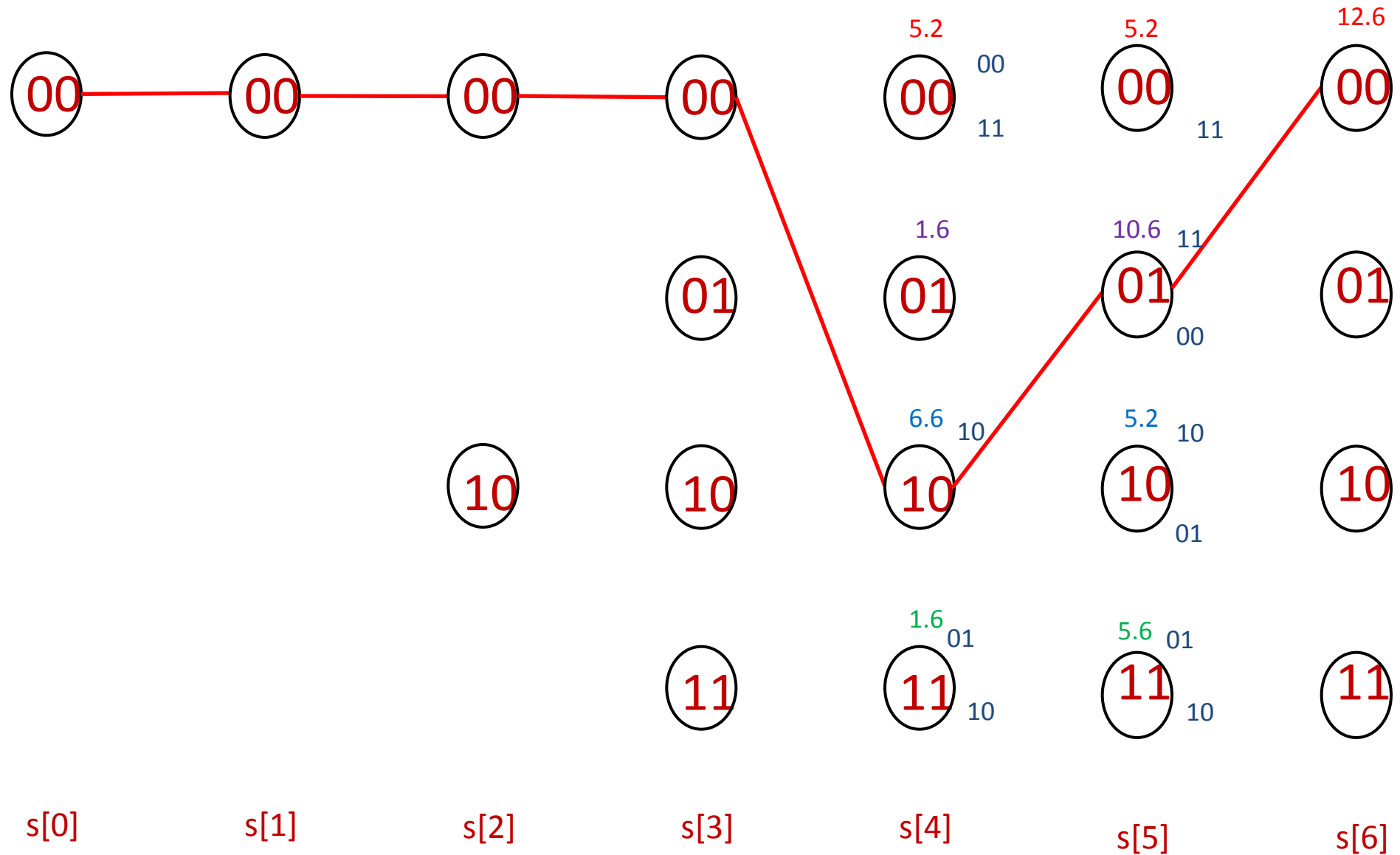
$z[2], z[3]=-0.1, 0.5$

$z[4], z[5]=0.3, 0.2$

$z[6], z[7]=-2, -2$

$z[8], z[9]=-2, 2$

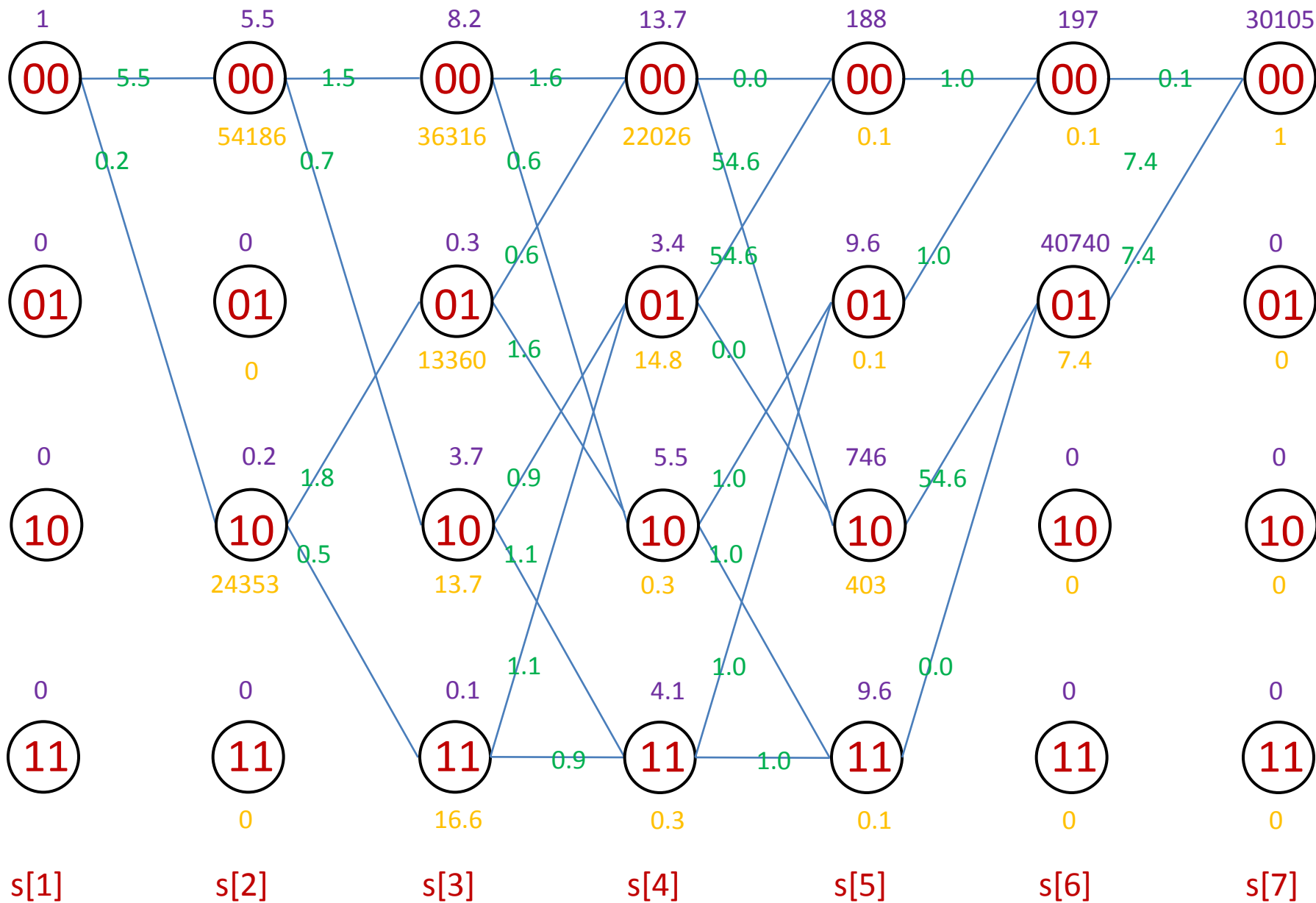
$z[10], z[11]=-1, -1$



Viterbi estimate of four info bits: 0001

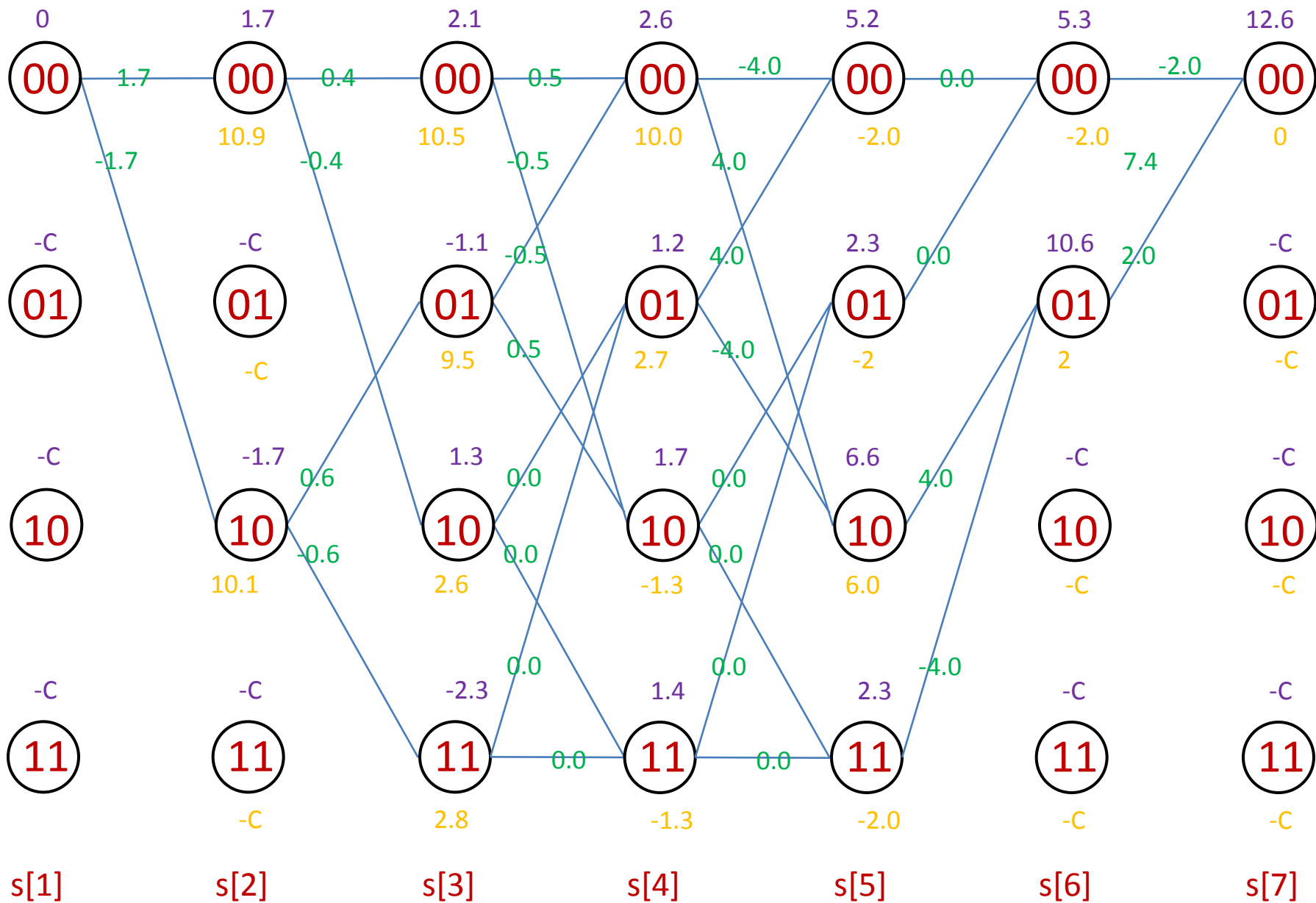
α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ α_2 $\gamma_5, \gamma_6=0.3, 0.2$ α_3 $\gamma_7, \gamma_8=-2, -2$ α_4 $\gamma_9, \gamma_{10}=-2, 2$ α_5 $\gamma_{11}, \gamma_{12}=-1, -1$ α_6

β_0 $u_1/c_1(1) c_1(2)$ β_1 $u_2/c_2(1) c_2(2)$ β_2 $u_3/c_3(1) c_3(2)$ β_3 $u_4/c_4(1) c_4(2)$ β_4 $0/c_5(1) c_5(2)$ β_5 $0/c_6(1) c_6(2)$ β_6



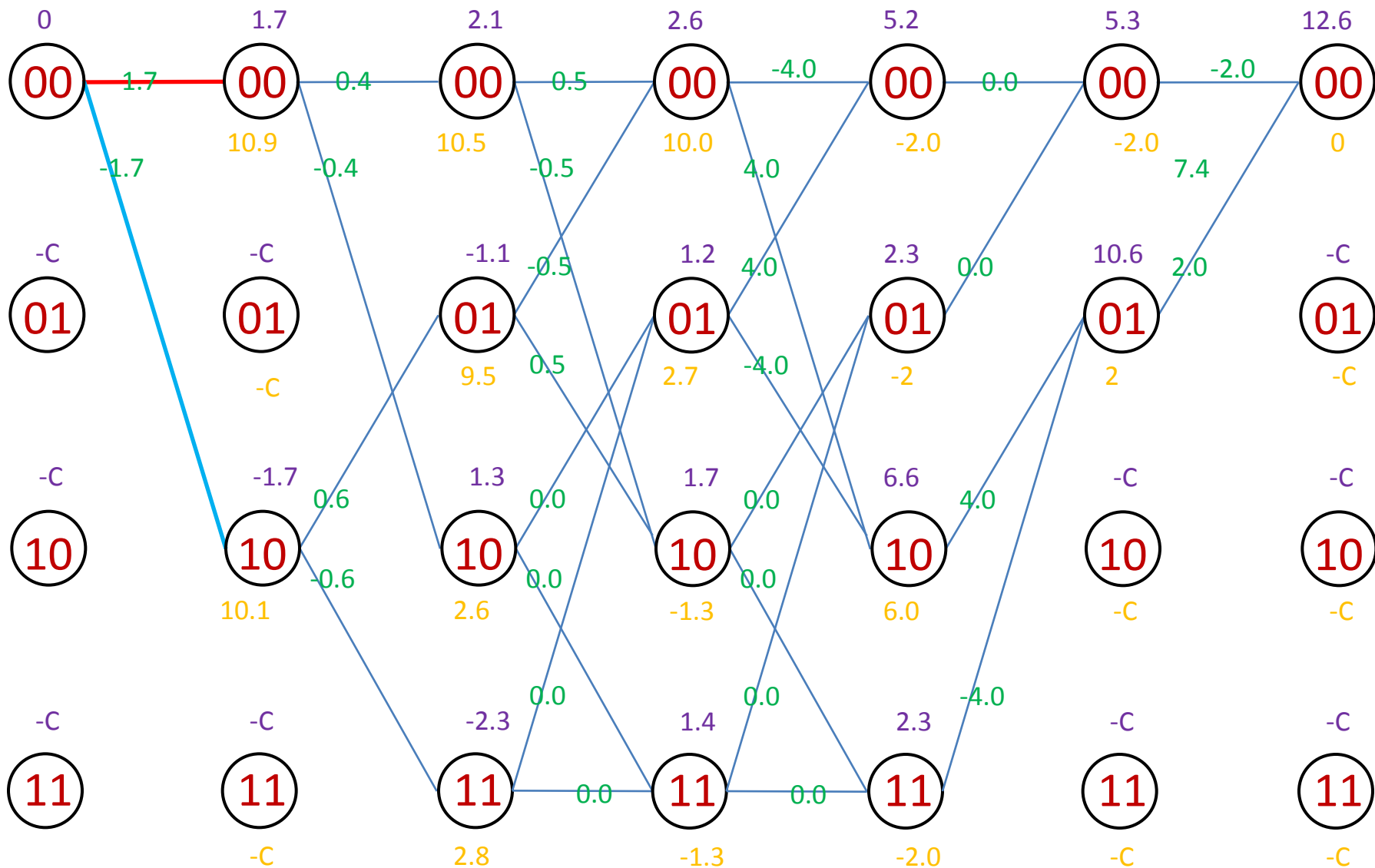
α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ α_2 $\gamma_5, \gamma_6=0.3, 0.2$ α_3 $\gamma_7, \gamma_8=-2, -2$ α_4 $\gamma_9, \gamma_{10}=-2, 2$ α_5 $\gamma_{11}, \gamma_{12}=-1, -1$ α_6

β_0 $u_1/c_1(1) c_1(2)$ β_1 $u_2/c_2(1) c_2(2)$ β_2 $u_3/c_3(1) c_3(2)$ β_3 $u_4/c_4(1) c_4(2)$ β_4 $0/c_5(1) c_5(2)$ β_5 $0/c_6(1) c_6(2)$ β_6



α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ α_2 $\gamma_5, \gamma_6=0.3, 0.2$ α_3 $\gamma_7, \gamma_8=-2, -2$ α_4 $\gamma_9, \gamma_{10}=-2, 2$ α_5 $\gamma_{11}, \gamma_{12}=-1, -1$ α_6

β_0 $u_1/c_1(1) c_1(2)$ β_1 $u_2/c_2(1) c_2(2)$ β_2 $u_3/c_3(1) c_3(2)$ β_3 $u_4/c_4(1) c_4(2)$ β_4 $0/c_5(1) c_5(2)$ β_5 $0/c_6(1) c_6(2)$ β_6



s[1] 4.2 s[2] s[3] s[4] s[5] s[6] s[7]

α_0 $\gamma_1, \gamma_2=0.9, 0.8$ α_1 $\gamma_3, \gamma_4=-0.1, 0.5$ α_2 $\gamma_5, \gamma_6=0.3, 0.2$ α_3 $\gamma_7, \gamma_8=-2, -2$ α_4 $\gamma_9, \gamma_{10}=-2, 2$ α_5 $\gamma_{11}, \gamma_{12}=-1, -1$ α_6

β_0 $u_1/c_1(1) c_1(2)$ β_1 $u_2/c_2(1) c_2(2)$ β_2 $u_3/c_3(1) c_3(2)$ β_3 $u_4/c_4(1) c_4(2)$ β_4 $0/c_5(1) c_5(2)$ β_5 $0/c_6(1) c_6(2)$ β_6

