Logic Circuit From Equation or Truth Table
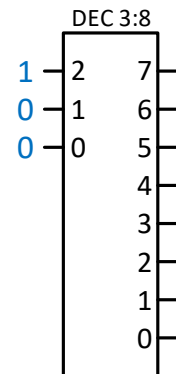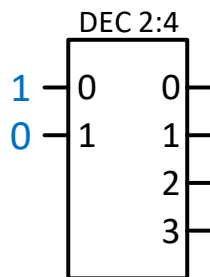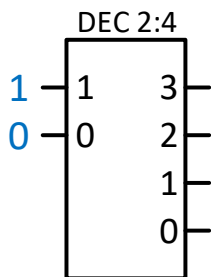
F = ABCD

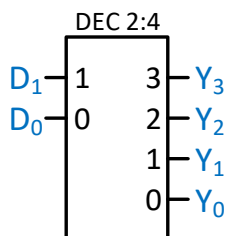| A	B	C	F
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	0

$F = \overline{A + B\overline{C}} \cdot D$

Decoders

Fill in the output values based on the provided input values.

DEC 2:4

1 — 1   3 —
0 — 0   2 —
         1 —
         0 —

DEC 2:4

1 — 0   0 —
0 — 1   1 —
         2 —
         3 —

DEC 3:8

1 — 2   7 —
0 — 1   6 —
0 — 0   5 —
         4 —
         3 —
         2 —
         1 —
         0 —

Decoder Waveform

Complete the decoder waveform.

DEC 2:4

D_1 — 1   3 — Y_3
D_0 — 0   2 — Y_2
             1 — Y_1
             0 — Y_0

D_1

D_0

Y_3

Y_2

Y_1

Y_0
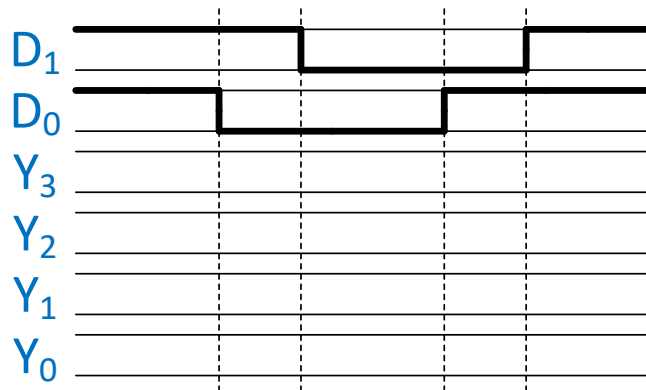
More Decoders

Determine what the decoder inputs must be based on the values of the decoder outputs.

DEC 3:8

2	7	0
1	6	1
0	5	0
	4	0
	3	0
	2	0
	1	0
	0	0

DEC 3:8

2	7	0
1	6	0
0	5	0
	4	0
	3	1
	2	0
	1	0
	0	0
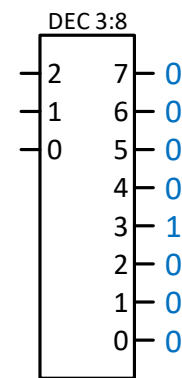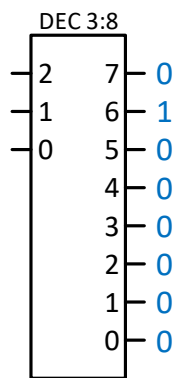
Multiplexer Waveform

Complete the multiplexer waveform.

MUX 2:1

D_1 — 1

D_0 — 0

Y

S

D_1

D_0

S

Y
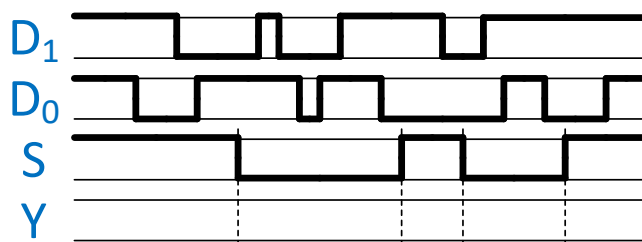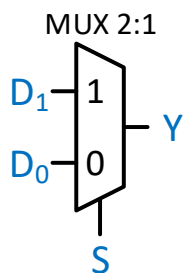
Adders

Connect the adder inputs so that it performs the computation K + M, where K=5 and M=6.

A B		A B		A B		A B
C_{out} + C_{in}		C_{out} + C_{in}		C_{out} + C_{in}		C_{out} + C_{in} 0
S		S		S		S