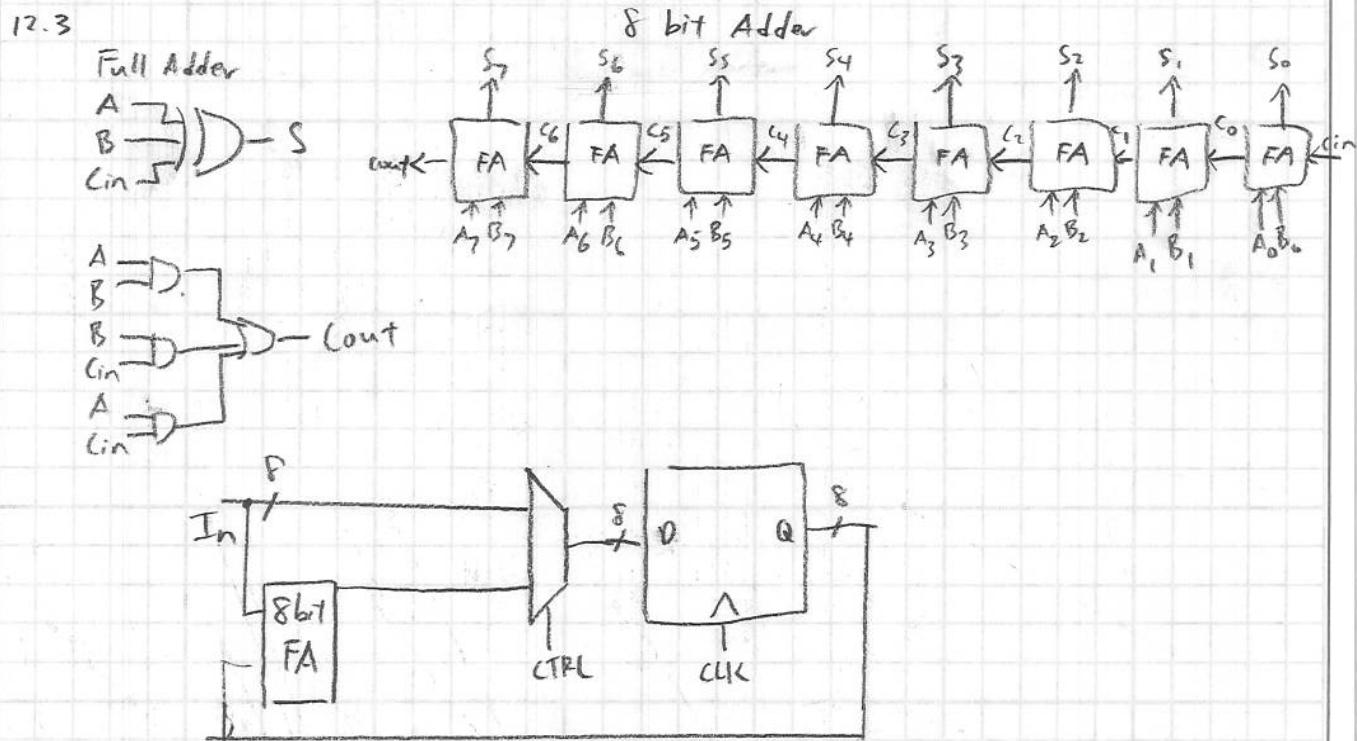
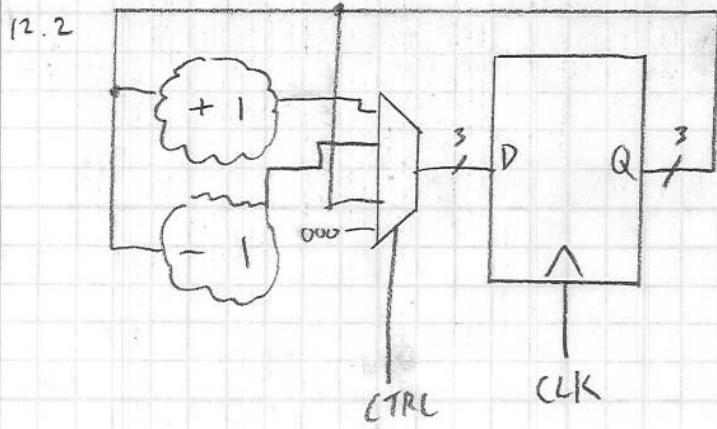
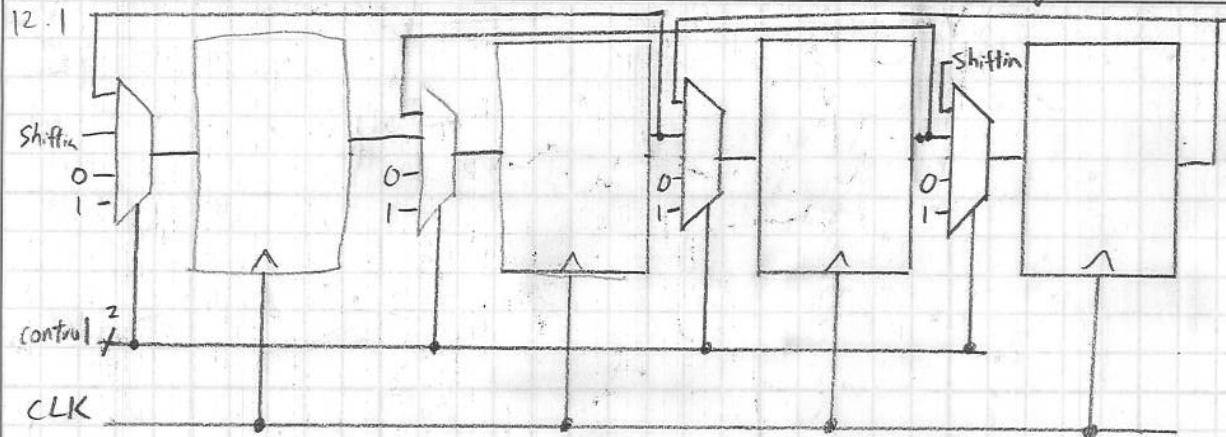


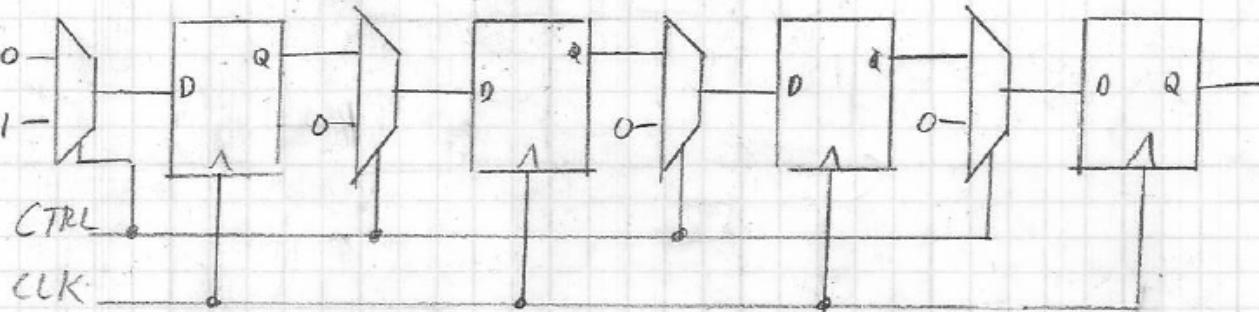
3-0235 — 50 SHEETS — 5 SQUARES  
 3-0236 — 100 SHEETS — 5 SQUARES  
 3-0237 — 200 SHEETS — 5 SQUARES  
 3-0137 — 200 SHEETS — FILLER

COMET



3-0235 — 50 SHEETS — 5 SQUARES  
 3-0236 — 100 SHEETS — 5 SQUARES  
 3-0237 — 200 SHEETS — 5 SQUARES  
 3-0197 — 200 SHEETS — FILLER

COMET



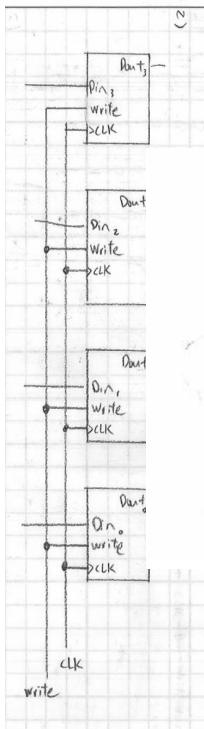
## LAB 7 Prep

1)

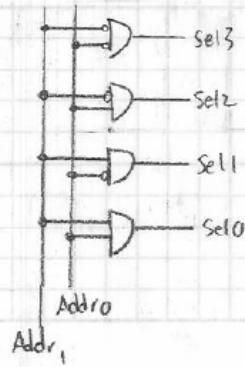
$$Dout^+ = Datain \cdot Write + Dout \cdot \overline{Write}$$

Dout	Open	Write	Dout <sup>+</sup>	0in	1in
0	0	0	0	00	01
0	0	1	0	00	01
0	1	0	0	01	11
0	1	1	1	11	11
1	0	0	1	10	10
1	0	1	0	10	10
1	1	0	1	11	11
1	1	1	1	11	11

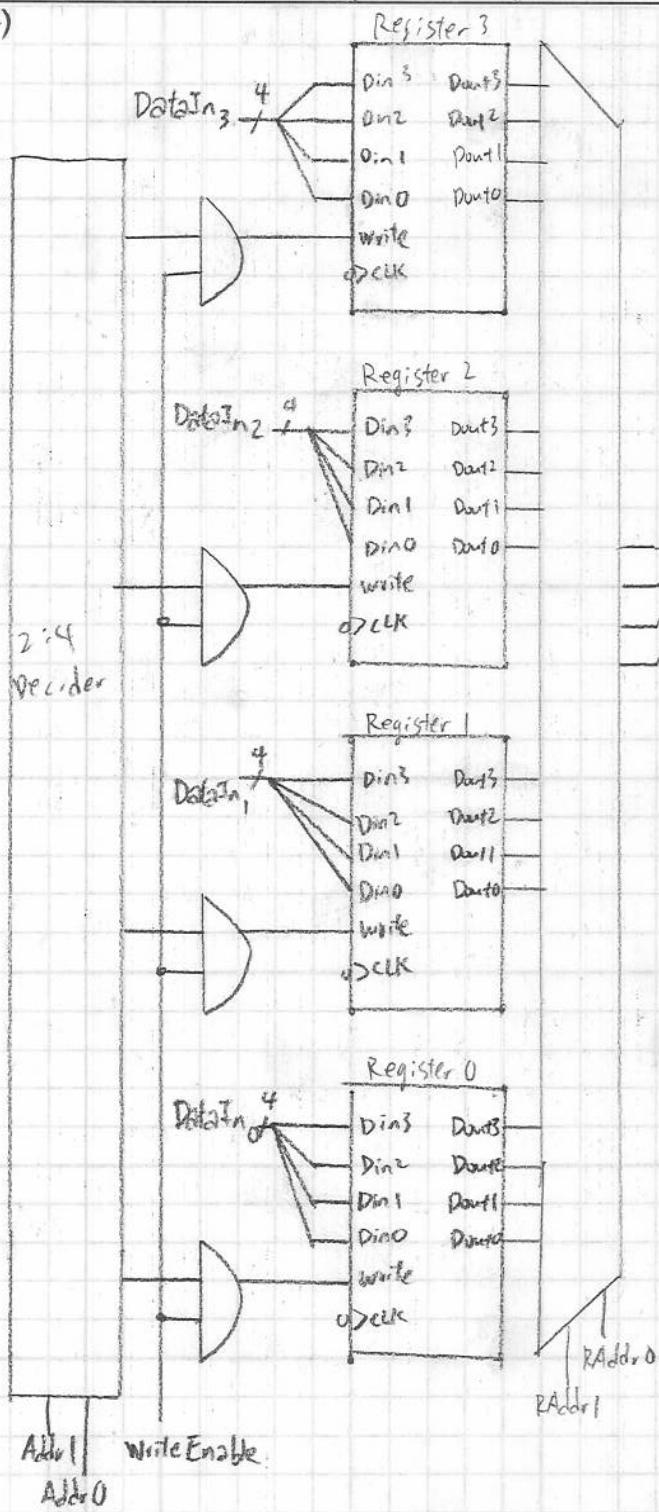
2)



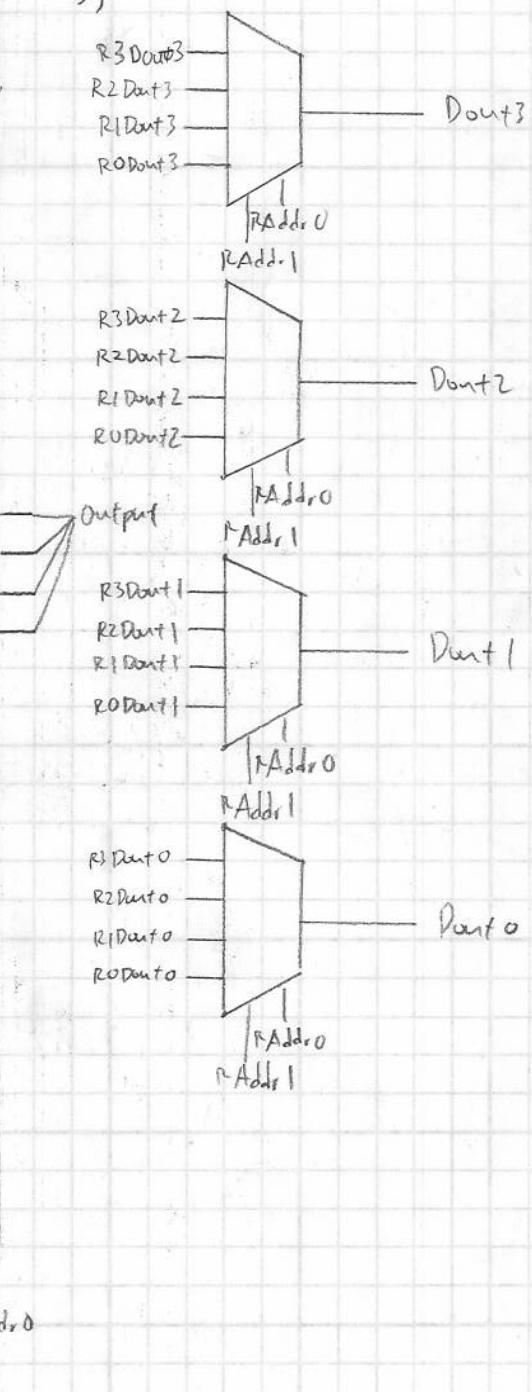
3)



4)



5)



13.1

 $\log_2(M+1)$  rounded up

13.2

$Q_2$	$Q_1$	$Q_0$	$N_2$	$N_1$	$N_0$
0	0	0	0	1	1
0	0	1	1	0	0
0	1	0	1	0	1
0	1	1	1	1	0
1	0	0	1	1	1
1	0	1	0	0	0
1	1	0	0	0	1
1	1	1	0	1	0

$Q_2$	$Q_1$	$Q_0$	$N_2$	$N_1$
0	0	0	0	1
0	0	1	0	0
0	1	0	0	1
0	1	1	1	0
1	0	0	1	1
1	0	1	0	0
1	1	0	0	1
1	1	1	0	0

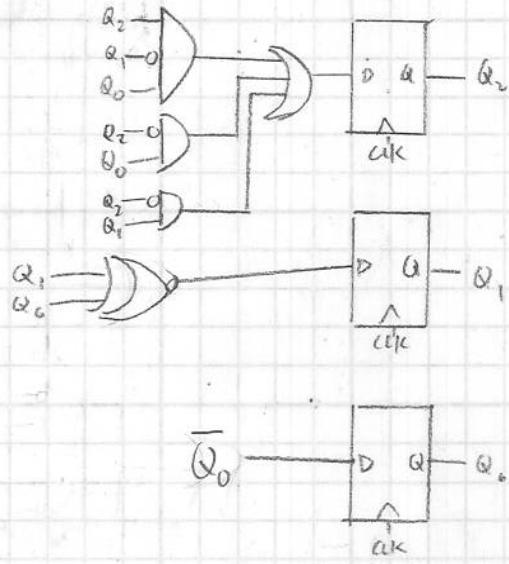
$Q_2$	$Q_1$	$Q_0$	$N_2$	$N_1$
0	0	0	0	1
0	0	1	0	1
0	1	0	1	1
0	1	1	1	1
1	0	0	1	0
1	0	1	0	0
1	1	0	1	1
1	1	1	1	0

$$N_2 = \bar{Q}_2 \bar{Q}_1 \bar{Q}_0 + \bar{Q}_2 Q_1 \bar{Q}_0 + \bar{Q}_2 Q_1 Q_0$$

$$N_1 = \bar{Q}_1 \bar{Q}_0 + Q_1 Q_0 = Q_1 \equiv Q_0$$

$Q_2$	$Q_1$	$Q_0$	$N_2$
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

$$N_0 = \bar{Q}_1 \bar{Q}_0 + Q_1 \bar{Q}_0 = \bar{Q}_0$$



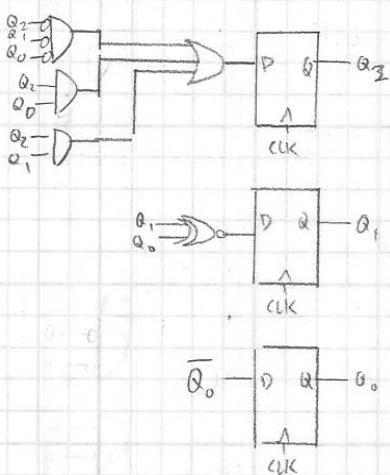
13.3

$Q_2$	$Q_1$	$Q_0$	$N_2$	$N_1$	$N_0$
0	0	0	1	1	1
0	0	1	0	0	0
0	1	0	0	0	1
0	1	1	0	1	0
1	0	0	0	1	1
1	0	1	1	0	0
1	1	0	1	0	1
1	1	1	1	1	0

(b)

 $Q_2$  $N_2$  $Q_1$  $N_1$  $Q_0$  $N_0$  $Q_2$  $N_2$  $Q_1$

13.3 (c)



13.5

COMET

$$T_{cycle} \geq t_{clk-Q} + t_{IFL} + t_{setup}$$

$$t_{setup} = 3\text{ns}$$

$$t_{clk-Q} = 2\text{ns}$$

$$t_{IFL} = t_{JKT} + t_{AND} + t_{OR} = 1\text{ns} + 2\text{ns} + 3\text{ns} = 6\text{ns}$$

$$T_{cycle} \geq 2\text{ns} + 6\text{ns} + 3\text{ns} =$$

$$\geq 11\text{ns}$$