Ariel Fallatah Midterm 2

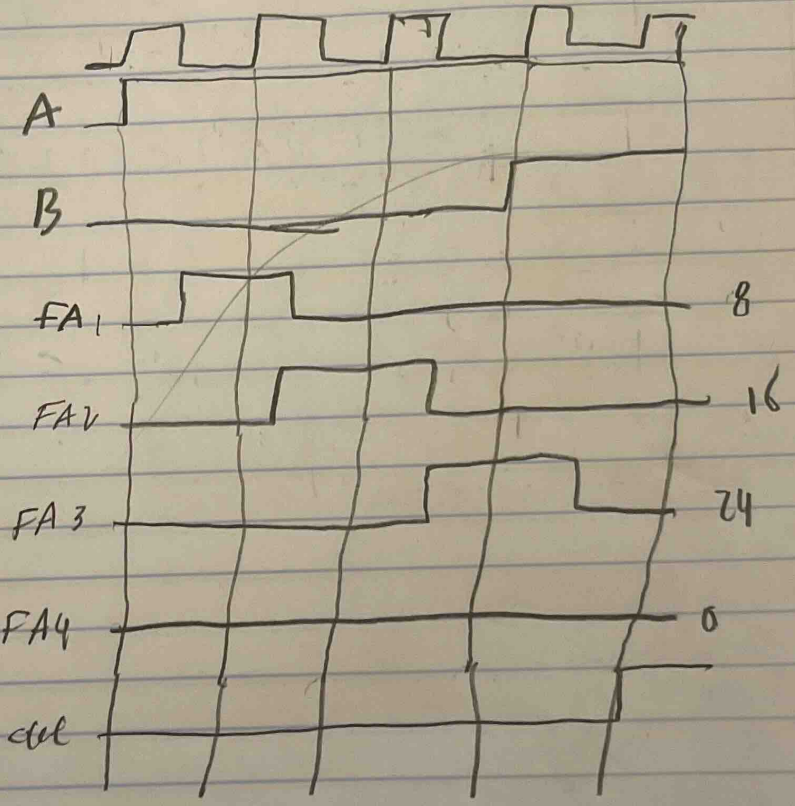
chapter 6

Q1

a) $\frac{1}{32} = 0.03125$ MHz

b) $\frac{1}{64} = 0.015625$ MHz

c)

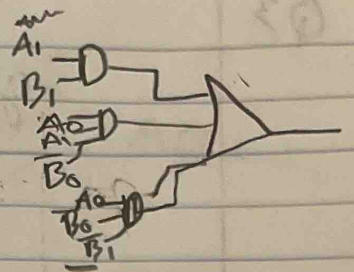


Q2

A_0	A_1	B_0	B_1	$A > B$	$A = B$	$A < B$
0	0	0	0	0	1	0
0	0	0	1	0	0	1
0	0	1	0	0	0	1
0	0	1	1	0	0	1
0	1	0	0	1	0	0
0	1	0	1	1	0	0
0	1	1	0	1	0	0
0	1	1	1	0	0	1
1	0	0	0	1	0	0
1	0	0	1	1	0	0
1	0	1	0	0	1	0
1	0	1	1	0	0	1
1	1	0	0	1	0	0
1	1	0	1	1	0	0
1	1	1	0	1	0	0
1	1	1	1	0	1	0

A > B

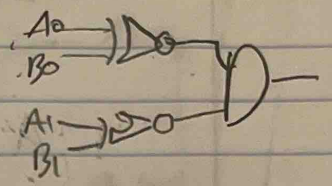
A \ B	00	01	11	10
00				
01	1			
11	1	1		
10	1	1		



$= A_1 \bar{B}_1 + A_1 A_0 \bar{B}_0 + A_0 \bar{B}_1 \bar{B}_0$

A = B

A \ B	00	01	11	10
00	1			
01		1		
11			1	
10				1



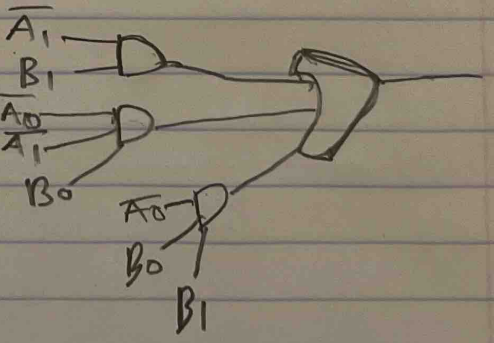
$= A_1 A_0 B_1 B_0 + \bar{A}_1 \bar{A}_0 \bar{B}_1 \bar{B}_0 + A_1 \bar{A}_0 B_1 \bar{B}_0 + \bar{A}_1 A_0 \bar{B}_1 B_0$

$= (A_1 \odot B_1)(A_0 \odot B_0)$

A < B

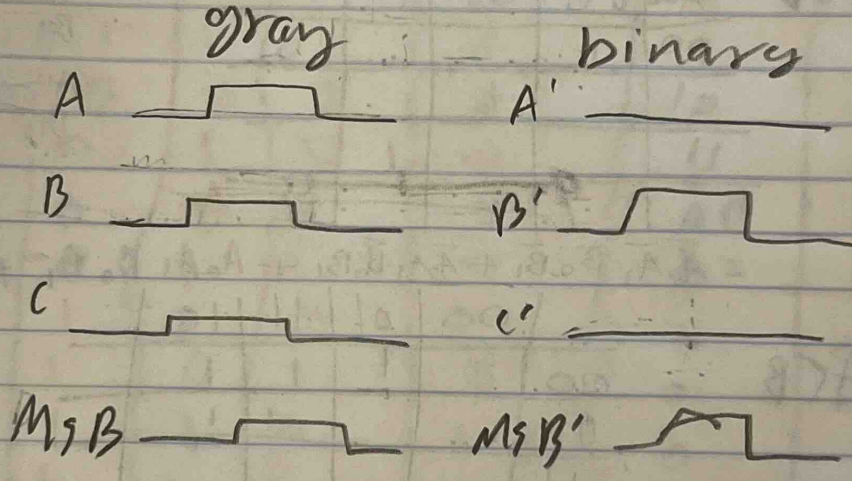
A \ B	00	01	11	10
00		1	1	1
01			1	1
11				
10			1	

$= \bar{A}_1 B_1 + \bar{A}_1 \bar{A}_0 B_0 + \bar{A}_0 B_0 B_1$

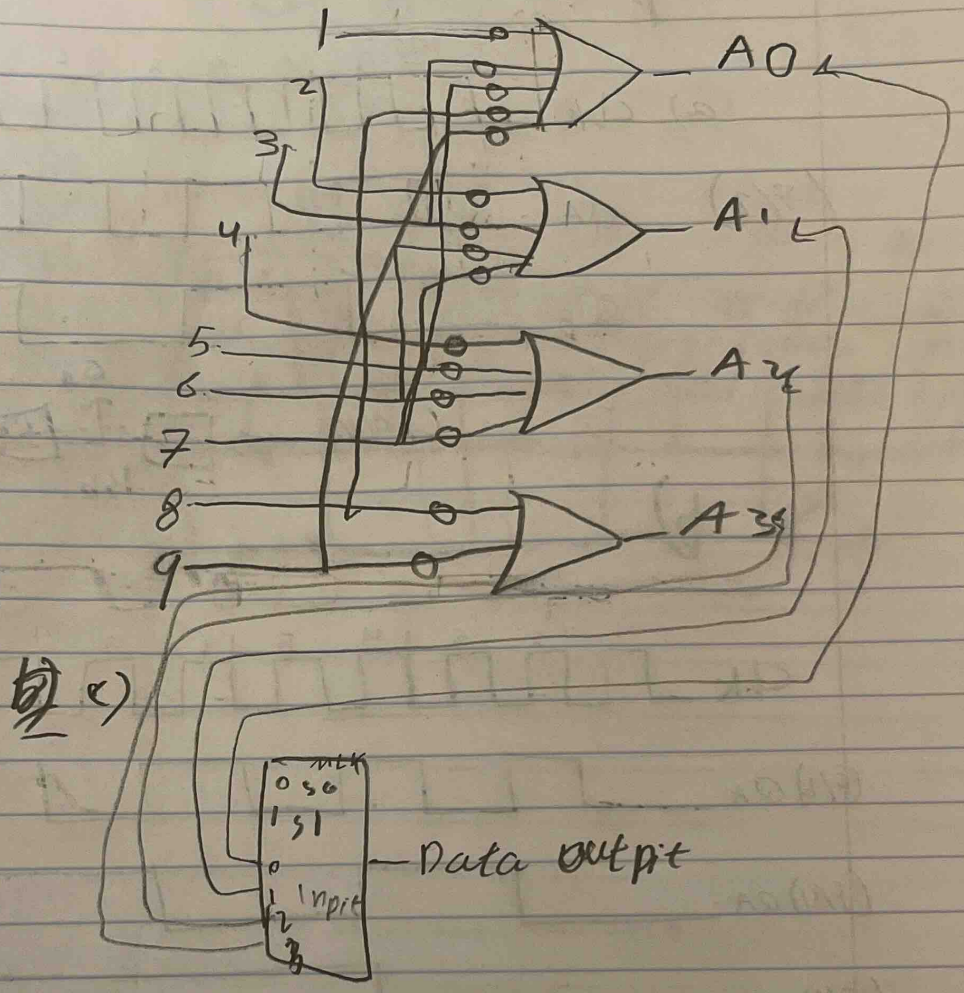


Q3

gray code	binary	
0 0 0 0	0 0 0 0	0
1 1 1 1	1 0 1 0	10
1 0 0 1	1 1 1 0	14
0 0 1 0	0 0 1 1	3

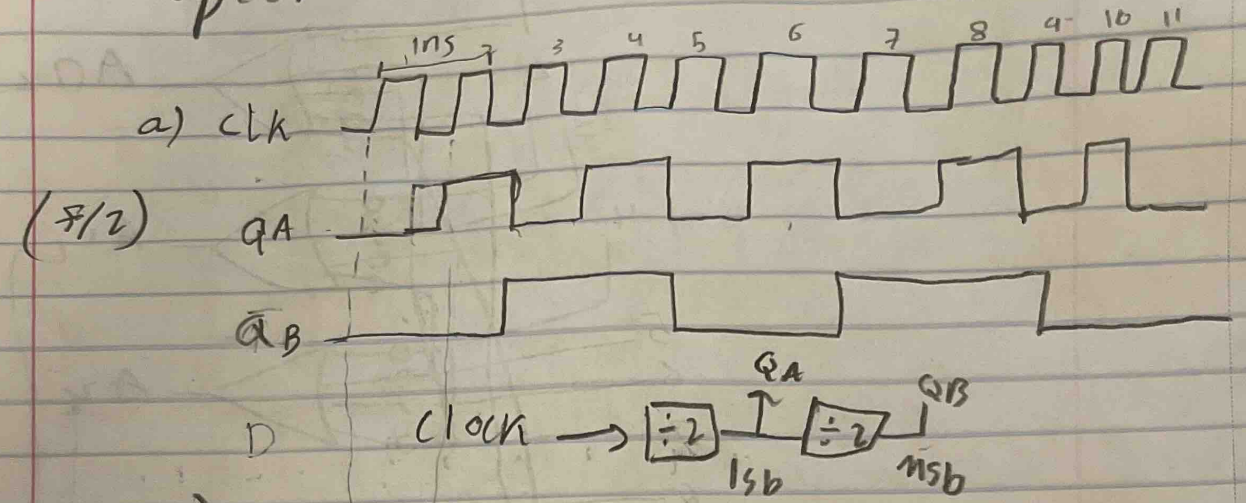


Q4 a) and B)

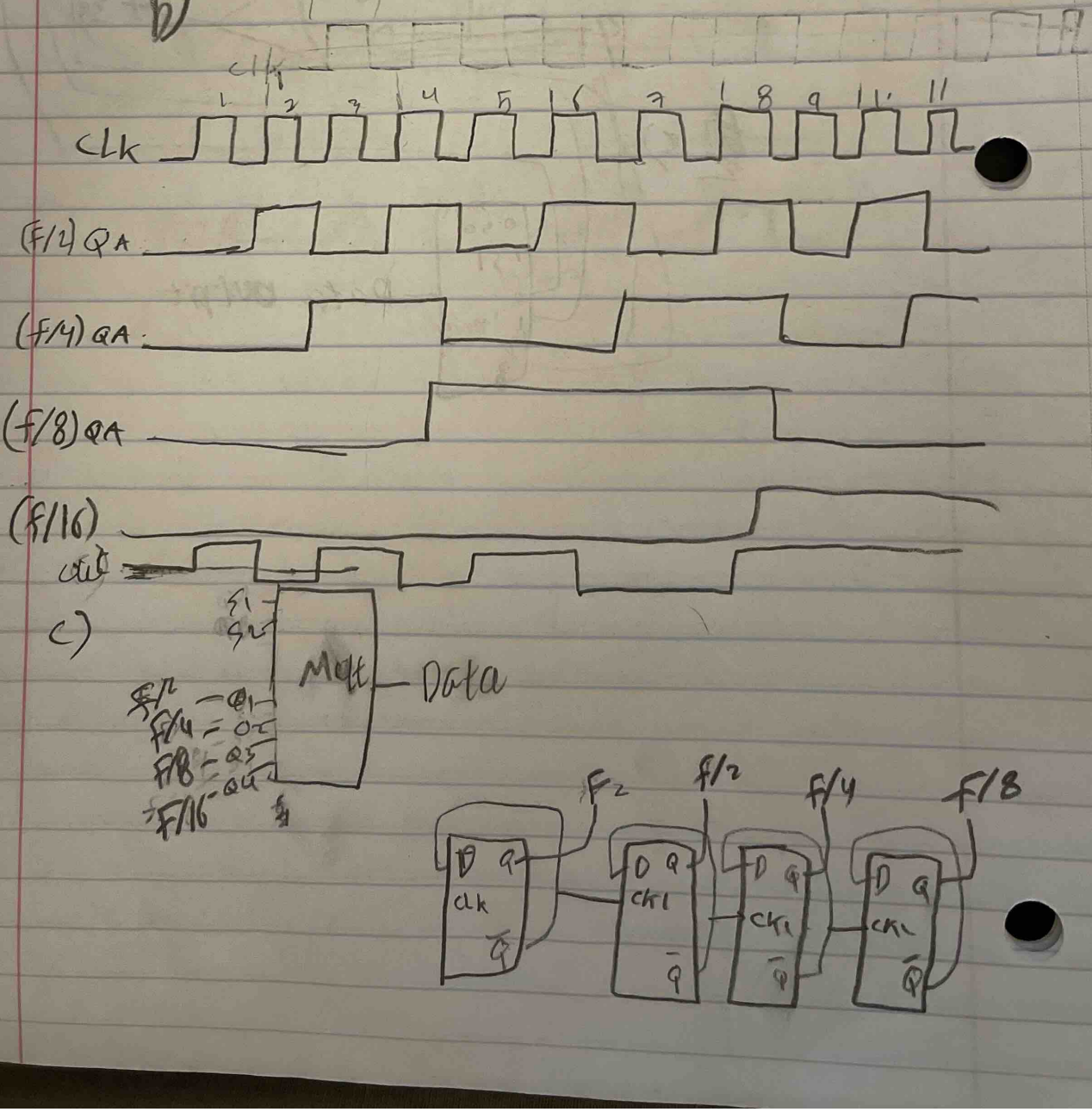


复 c)

Chapter 7

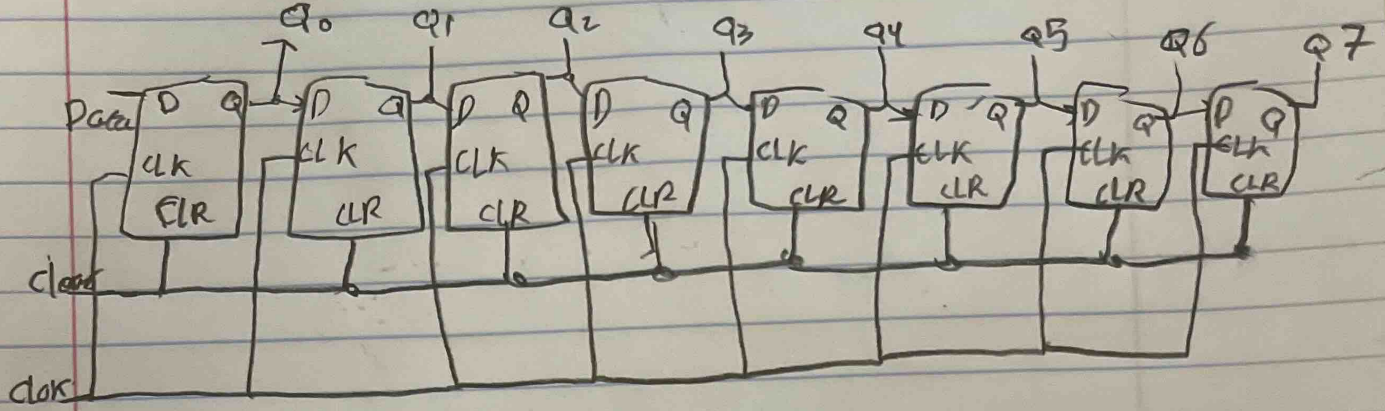

1ms
a) clk
(F/2) QA
$\bar{Q}_B$
D
Clock
÷2
÷2
QA
QB
lsb
msb

b)


clk
clk
(F/2) QA
(F/4) QA
(F/8) QA
(F/16)
out
c)
F1
F2
F/2 = Q1
F/4 = Q2
F/8 = Q3
F/16 = Q4
Mux
Data
F2
F/2
F/4
F/8
D Q
clk
$\bar{Q}$
clk

chapters 8-9

Q1)



Q2)