

Digital & logic Circuit
ELE 221

Model Ans. - 1st term
2015/2016

Q1

(A)

1111 1111

i. unsigned decimal no $\Rightarrow$ 255

ii. Signed decimal no. $\Rightarrow$ -1

(B) Decode 49 20 41 4D 20 46 41 53 48 45 4C
I A M D F A S H E L

(C) highest signed decimal by 4 bits $\Rightarrow$ 7

(D) -20 $\Rightarrow$ -32 16 8 4 2 1
1 0 1 1 0 0

6-bits

Q2

(A) $Y = B + \bar{B} + \bar{A}B\bar{C} + (\bar{A} + \bar{C})$
 $Y = 1$

(B)

A B		C D			
		00	01	11	10
0	0			1	1
0	1			1	1
1	1	1		X	X
1	0	1		X	X

$F = C + A\bar{D}$

(C)

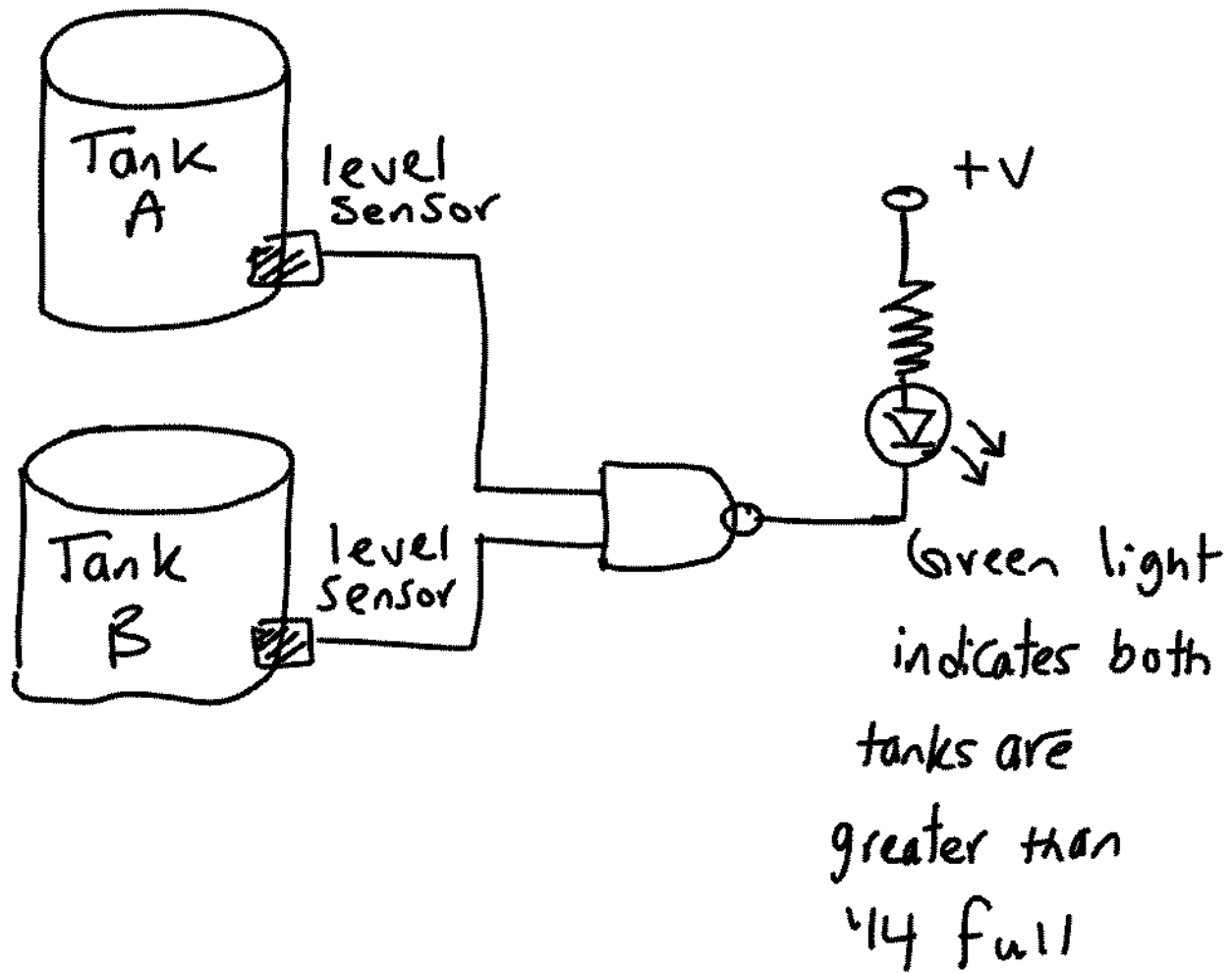
x	y	z	F
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

$f = \sum (3, 5, 6, 7)$

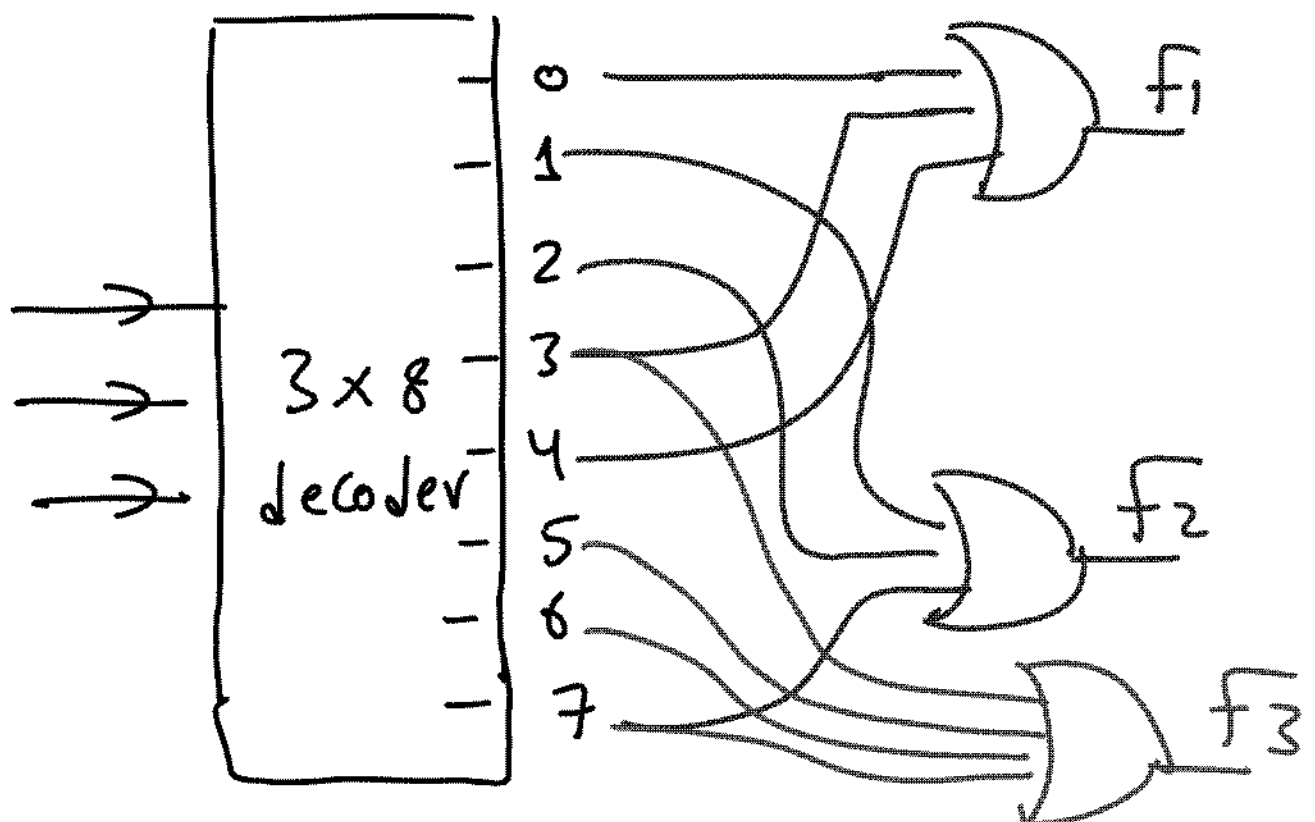
$f = \prod (0, 1, 2, 4)$

Q3

(A)



(B)



©

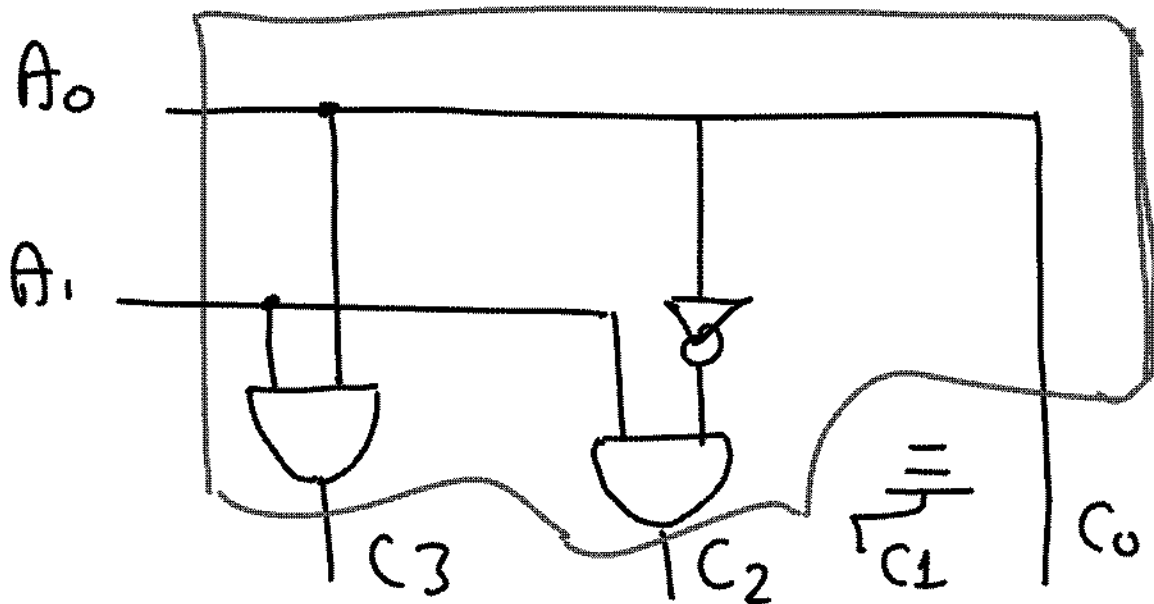
A_1	A_0	C_3	C_2	C_1	C_0
0	0	0	0	0	0
0	1	0	0	0	1
1	0	0	1	0	0
1	1	1	0	0	1

$$C_0 = A_0$$

$$C_1 = 0$$

$$C_2 = A_1 \bar{A}_0$$

$$C_3 = A_1 A_0$$

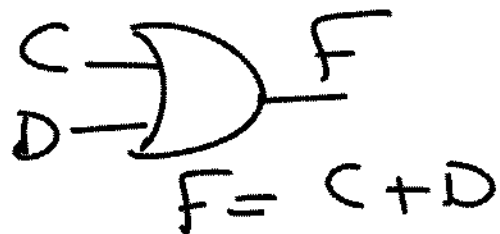
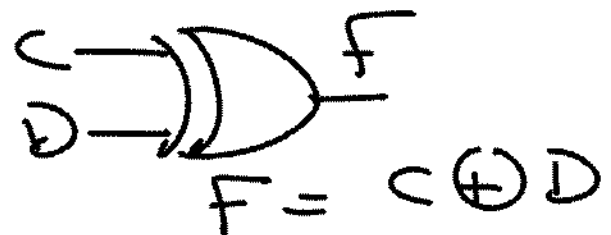
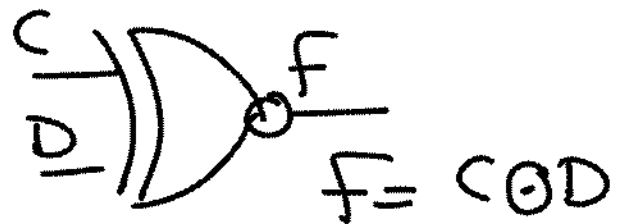


Q4

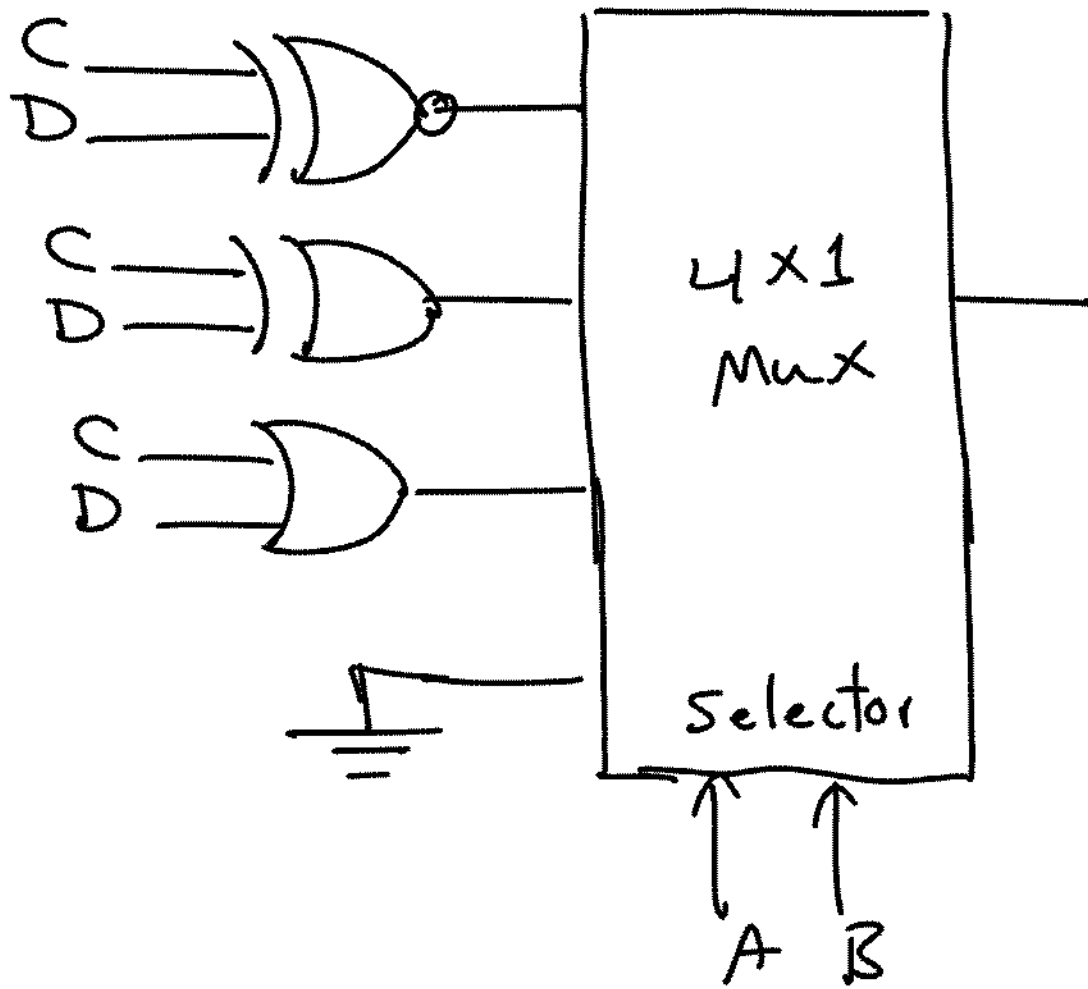
(A)

$AB \Rightarrow \text{Selector}$

A	B	C	D	F
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0



$F = 0$



(B)

D_0	D_1	D_2	D_3	X	Y
X	X	X	1	1	1
X	X	1	0	1	0
X	1	0	0	0	1
1	0	0	0	0	0

$$X = D_3 + D_2$$

$$Y = D_3 + D_1 \bar{D}_2$$

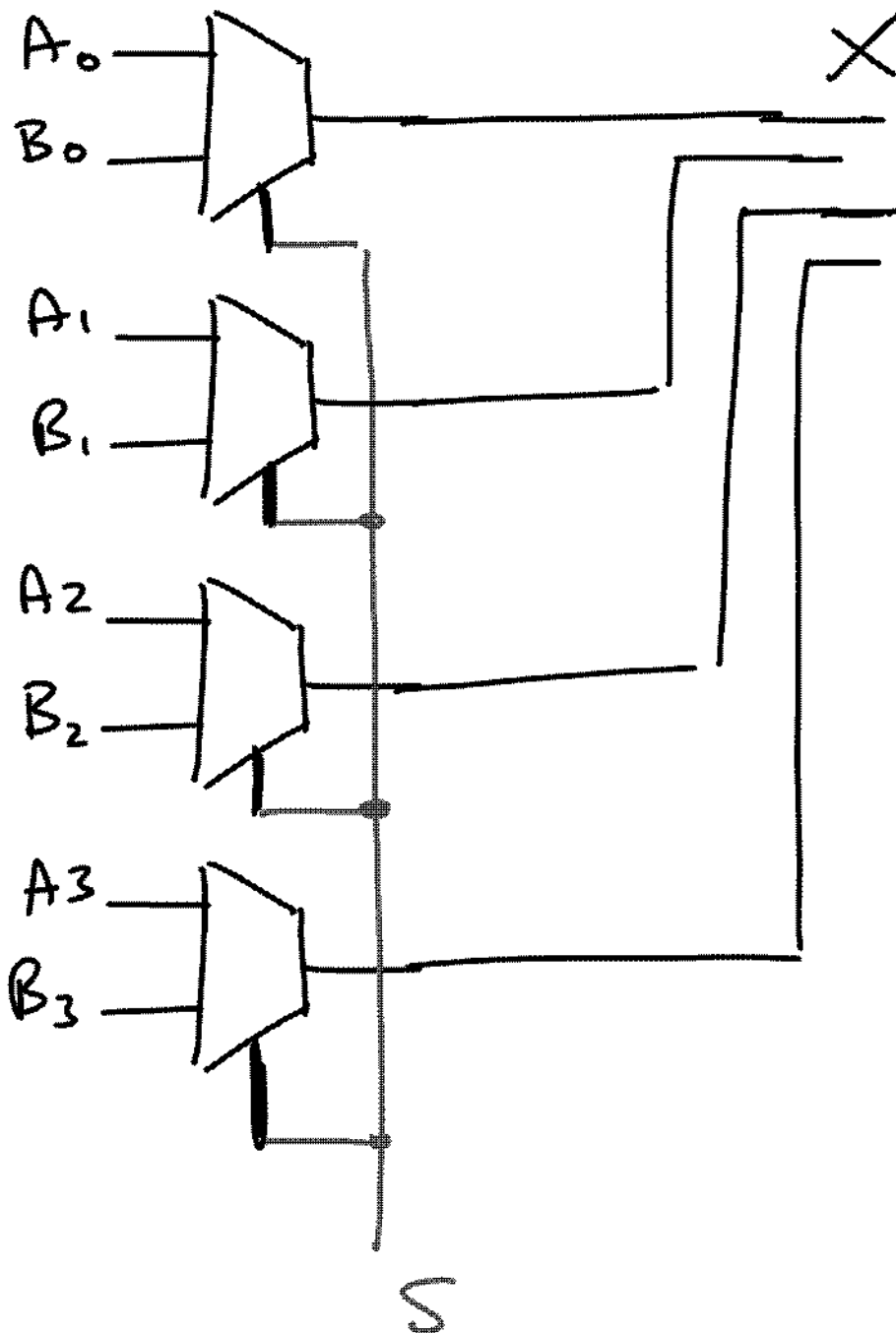
Q5

(A)

$$X = (A_0 \ominus B_0)(A_1 \ominus B_1)(A_2 \ominus B_2)(A_3 \ominus B_3)$$

↳ equality $x=1$ if $A=B$

(B)



Q6

x	y	z	A	B	C
0	0	0	0	0	1
0	0	1	0	1	0
0	1	0	0	1	1
0	1	1	1	0	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

$$C = \overline{z}$$

x \ yz	00	01	11	10
0			1	
1		1	1	1

$$A = xy + xz + yz$$

x \ yz	00	01	11	10
0		1		1
1	1		1	

$$B = x \oplus y \oplus z$$

⑧

$$D_0 = \overline{\overline{A} \overline{B} \overline{E}} = A + B + E$$

$$D_1 = \overline{\overline{A} \overline{B} \overline{E}} = A + \overline{B} + E$$

$$D_2 = \overline{\overline{A} \overline{B} \overline{E}} = \overline{A} + B + E$$

$$D_3 = \overline{\overline{A} \overline{B} \overline{E}} = \overline{A} + \overline{B} + E$$