

HW 11 Solution

7.5 a) 5.625

b) 7.75

c) 10.25

d) 7.875

e) 8.3125

f) 21.375

7.7 7 bits because $2^7 = 128 > 100$

10 bits because $2^{10} = 1024 > 1000$

20 bits because $2^{20} = 1048576 > 10^6$

7.8 a) $173_{10} = 10101101_2 = 255_8 = AD_{16}$

b) $299.5_{10} = 100101011.1_2 = 453.4_8 = 12B.8_{16}$

c) $735.75_{10} = 101101111.11_2 = 1337.6_8 = 2DF.C_{16}$

d) $313.0625_{10} = 100111001.0001_2 = 471.04_8 = 139.1_{16}$

e) $112.25_{10} = 1110000.01_2 = 160.2_8 = 70.4_{16}$

7.22 a) $D = ABC + A\bar{B}$

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

b) $E = AB + A\bar{B}C + \bar{C}D$

A	B	C	D	E
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
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	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

7.22 c) $Z = WX + \overline{(W+Y)}$

X	Y	W	Z
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	1

d) $D = A + \bar{A}B + C$

A	B	C	D
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

e) $D = \overline{(A+BC)}$

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

7.23 a) $F = (A+B)\bar{C}$

b) $F = A+B+\bar{B}C$

c) $F = AB + \bar{B}C + D$

7.24

A	B	A+B	$\bar{A}+AB$	$(A+B)(\bar{A}+AB)$
0	0	0	1	0
0	1	1	1	1
1	0	1	0	0
1	1	1	1	1

7.27

A	B	C	$(ABC + AB\bar{C} + A\bar{B}C + A\bar{B}\bar{C})$
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

7.31 If C is closed, and A or B is closed the output is connected to 5V, which is high.

$D = (A+B)C$

7.31 cont.

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

$$7.35 \quad F = \bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + A\bar{B}C + ABC$$

$$= \sum m(0, 2, 5, 7)$$

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

$$= \prod M(1, 3, 4, 6)$$

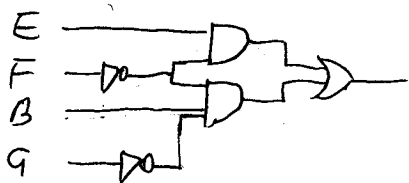
7.41 a)

B	E	F	G	I
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	1
1	1	1	0	0
1	1	1	1	0

b) $I = \sum m(4, 5, 8, 12, 13)$

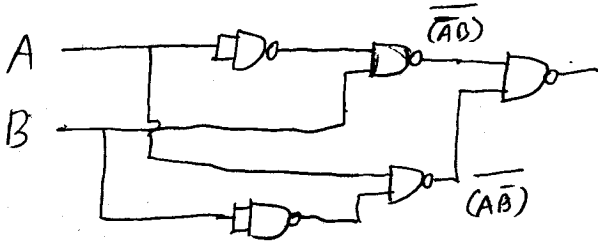
c) $I = \prod M(0, 1, 2, 3, 6, 7, 9, 10, 11, 14, 15)$

d) $I = E\bar{F} + B\bar{F}\bar{G}$



7.42

$$A \oplus B = A\bar{B} + \bar{A}B = \overline{(A\bar{B})(\bar{A}B)}$$



7.54

	B ₄			
	0	4	6	2
B ₃	0	8	12	14
	1	13	15	11
	0	5	7	3
	0	1	9	10
	B ₂			
	B ₁			

$$X = B_3 B_4 + B_3 B_2$$