

1. pattern

a. $2*2*2*2*2=32$

b. largest: 11111111(2)

$=2^7*1+2^6*1+2^5*1+2^4*1+2^3*1+2^2*1+2^1*1+2^0*1=255(10)$

2. Binary Conversion

a. $00011_{(2)}=2^4*0+2^3*0+2^2*0+2^1*1+2^0*1=3(10)$

b. $11011_{(2)}=2^4*1+2^3*1+2^2*1+2^1*1+2^0*1=27(10)$

c. 111011000₍₂₎

$=2^7*1+2^6*1+2^5*1+2^4*0+2^3*1+2^2*0+2^1*0+2^0*0=472(10)$

d. $1111_{(2)}=2^3*1+2^2*1+2^1*1+2^0*1=15(10)$

3. Boolean Expression

a. (A&&B) || C

A	B	C	A&&B	(A&&B) C
0	0	0	0	0
0	0	1	0	1
0	1	0	0	0
1	0	0	0	0
0	1	1	0	1
1	0	1	0	1
1	1	0	1	1
1	1	1	1	1

b. (!A&&B)

A	B	!A	!A&&B
0	0	1	0
0	1	1	1
1	0	0	0
1	1	0	0

c. (A&&B) || (B&&C)

A	B	C	A&&B	B&&C	(A&&B) (B&&C)
0	0	0	0	0	0
0	0	1	0	0	0
0	1	0	0	0	0
1	0	0	0	0	0
0	1	1	0	1	1
1	0	1	0	0	0
1	1	0	1	0	1
1	1	1	1	1	1

b. $!(A || B) \&\& (A || C)$

A	B	C	A B	!(A C)	A C	!(A B) && (A C)
0	0	0	0	1	0	0
0	0	1	0	1	1	1
0	1	0	1	0	0	0
1	0	0	1	0	1	0
0	1	1	1	0	1	0
1	0	1	1	0	1	0
1	1	0	1	0	1	0
1	1	1	1	0	1	0