

3.2(1)

toggled

	bc	00	01	11	10
a	0	1		1	
1			1		1

$$\bar{a}\bar{c} + a\bar{b}c + b\bar{c}$$

(2) $f(r,s,t) = r(s+t)\bar{t} + \bar{r}\bar{s}(t+\bar{t}) + \bar{r}s(t+\bar{t})$
 $= rs\bar{t} + r\bar{s}\bar{t} + \bar{r}\bar{s}t + \bar{r}\bar{s}\bar{t} + \bar{r}st + \bar{r}st$

r	st	00	01	11	10
0		1	1	1	1
1		1			1

$$\bar{s}\bar{t} + \bar{r} + s\bar{t}$$

(3)

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

$$\bar{x}z + \bar{x}y + y\bar{z} + x\bar{z}$$

(1)

3.3 ①

ab \ cd	00	01	11	10
00	1	1	1	1
01	1	1	1	1
11	1	1	1	1
10	1	1	1	1

$$\bar{a}\bar{c}\bar{d} + \bar{b}\bar{c}\bar{d} + \bar{a}cd + \bar{a}\bar{b}c + abc\bar{d}$$

②

ab \ cd	00	01	11	10
00	1	0	0	0
01	0	1	1	1
11	1	1	0	1
10	1	0	1	1

$$\bar{b}\bar{c}\bar{d} + a\bar{d} + b\bar{c}d + \bar{a}bd + \bar{a}bc$$

③

pos version

ab \ cd	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	0	0	0	0
10	0	0	0	0

$$(a + \bar{b} + c + d) \cdot (\bar{a} + b + c + \bar{d})$$

$$(\bar{a} + \bar{b} + \bar{c} + \bar{d}) \cdot (a + b + d)$$

$$(a + b + \bar{c})$$

3.4. overflow only happens:
 $P + P = N$, $N + N = P$.
 (adopt the carry) final

$$N + P = N \text{ or } P$$

$$\begin{array}{r} 1101 \\ 84 \\ -8 \\ \hline \end{array} = 13$$

③

$$\begin{array}{r}
 3.4(a) \quad \begin{array}{r} 010101 \\ 001011 \\ \hline 010000 \end{array} \begin{array}{l} P \\ P \\ N \end{array} \quad 0V
 \end{array}$$

$$\begin{array}{r}
 (b) \quad \begin{array}{r} 100000 \\ 110010 \\ \hline 11010010 \end{array} \begin{array}{l} N \\ N \\ P \end{array} \quad 0V
 \end{array}$$

$$\begin{array}{r}
 (c) \quad \begin{array}{r} 100111 \\ 010010 \\ \hline 111001 \end{array} \begin{array}{l} P \\ H \\ N \end{array} \quad \text{No } 0V
 \end{array}$$

$$\begin{array}{r}
 (d) \quad \begin{array}{r} 10000 \\ + 01101 \\ \hline 100001 \end{array} \begin{array}{l} N \\ P \\ P \end{array} \quad \text{No } 0V
 \end{array}$$

(e)
$$\begin{array}{r} 101011 \\ 111910 \\ \hline 101111 \\ \hline 100000 \end{array}$$
 N No
N OV
P
N

(f)
$$\begin{array}{r} 10110 \\ 10101 \\ \hline 01011 \end{array}$$
 OV

(i)
$$\begin{array}{r} 1011 \\ 01001 \\ \hline 010100 \end{array}$$
 P P
N
OV

(g)
$$\begin{array}{r} 10110 \\ 11010 \\ \hline 10000 \end{array}$$
 N No
N OV
N

(h)
$$\begin{array}{r} 11000 \\ 10101 \\ \hline 01101 \end{array}$$
 OV

(5)