CSCI 2021 5188260 YuKunQin 5:45

1.

① a. (0201)16

b. 0000 0000 0000 0011 = 1111 1111 1111 1100
= 1111 1111 1111 1101
= (FFFD)16

② (0201)16 = $16^0 + 2\times16^3 = 513$

(FFFD)16 = $13\times16^0 + 15\times16^1 + 15\times16^2 + 15\times16^3 = 65533$

③ a. min = -2^{15} max = $2^{15}-1$

b. min = 0 max = $2^{16}-1$

2.

a. x = C C 1100 XXXX 1100

~x = 0011 XXXX 0011

y = XXX1 1101 0XXX

x = C2C

b. x = 110000101100

x = (3116)

c. y = 0011110100011 = (1979)

3.

N/a	0	000000
n/a	-1	111111
n/a	29	011101
n/a	-17	101111
n/a	26	011010
n/a	-26	100110
TMax	31	011111
TMin	-32	100000
-TMin	-32	100000
-TMax	-31	100001
TMax+TMax	-2	011111 + 011111 = 111110

TMin+TMin 0 100000
+100000
000000

TMin+1 -31 100001

TMin-1 -31 100000
+111111
011111

TMax+1 -32 011111
+000001
100000

TMin+TMax -1 100000
+011111
111111

TMax*2 -2 011111
+011111
111110

TMax/2 15 001111

4. 1.G 2.C 3.B 4.F 5.I

5.
```
int multFiveEighths (int x)
{   int e = x>>3;
    int re = x&7
    int se = (x>>31 &7)
return (e+(e<<2) + (re+(re<<2) + se.>>3));
}
```

6. format A.

① 01011011

7-15=-8

3/8+1=11/8

11/8 x 2^7 = 176

② 10011010

7+1 := -8

$-2^{-8} \times (1+\frac{2}{8}) := -1.25 \times 2^{-8}$

③ 00000 111

$\frac{7}{8} \times (2^{-14})$

$= 0.875 \times 2^{-14}$

④ 1 1111 000

-2^{13}

⑤ 0 1011 100

$(\frac{2}{8}) \times 2^{8} = 384$

format B

① 0 11100000 $+\infty$

② in A is 1 00111 010

in B $S = 1$

$f = -5$

the smakest is 1 00000 001 which is $-(\frac{1}{32}) \times 2^{-2}$

and we need to round up

~~So it is 0 000 00000 0~~

③ in A is 0 00000 111

round to nearest one 0 00000 001 $(\frac{1}{32}) \times 2^{-2}$

so it is 0 0000 00001 $(\frac{1}{32}) \times 2^{-2}$

④ in A is 1 11100 000

the smallest non-infinit number is 1 1110 1111

$-2^{3} \times (\frac{31}{32} + 1) = -15.75$

⑤ 0 1111 00000 $+\infty$

7. if $x>0$ $x*x>0$ false $2^{16}\cdot 2^{16}=2^{32}$ anflow <0

$((x>>1)<<1)==x$ False 00001 >>1 = 00000

$(u\&0)==0$ true

$u<=-1$ true

if $x<0$ then $u>x$ false max of u is $2^{32}-1$
max of x is $2^{32}+x$
So we can not determin
Which one is biger

$u>=0$ true

if $x>y$ the $-x<-y$ False if yxis TMin xisTMin-[
-y is also TMin -xispositive
So ~~is not~~ $-x \neq -y$