Solution

Problem 1: (16points)

1 31, -30

2 (1 100001 000001111)$_{16}$

3 [1] $0.015625*2^{-30}$

[2] $1.03125*2^{-27}$

4 $(1.00001)2 *2^{-27}$

Problem 2: (24points)

1 [1] 24 [2] 0xbfbf523c
[4] 0xbfbf523c [5] 0xbfbf5240
[5] 0xbfbf5244 [6] 0xbfbf5248
[7] 0xbfbf5244 [8] 0xbfbf5250

2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
a	a	a	a	a	a	a	a	a	-	b	b	b	b	b	b
c	c	c	c	d	-	-	-	e	e	e	e	-	-	-	-
f	f	f	f	f	f	f	f	g	g	-	-	-	-	-	-

3

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
a	a	a	a	a	a	a	a	a	d	b	b	b	b	b	b
c	c	c	c	e	e	e	e	f	f	f	f	f	f	f	f
g	g	-	-	-	-	-	-								

4 14
5 6

Problem 3: (16points)

1 [1] n/2 [2] 9 [3] 8

[4] $5 [5] .L2 [6] .L9(, %edx, 4)

[7] .L3 [8] .L5

Problem 4: (24points)

1 [1] 0x80489ec

[2] Rewrite %ebp to a, and rewrite the cookie number at a+8

[3]

```
00  00  00  00  00  00  00  00  00  00  00  00
00  00  00  00  00  00  00  00  00  00  00  00
00  00  00  00  EC  89  04  08  00  00  00  00
D2  04  00  00
```

2 [1] 0x804ba30

[2] 0x80489ec

[3] 0xbfbe6500

[4]

```
C7  05  30  BA  04  08  D2  04  00  00  68  EC
89  04  08  C3  00  00  00  00  00  00  00  00
00  00  00  00  00  65  BE  BF
```

OR

```
68  EC  89  04  08  C7  05  30  BA  04  08  D2
04  00  00  C3  00  00  00  00  00  00  00  00
00  00  00  00  00  65  BE  BF
```

Problem 5: (10points)

1 [1] `mrmovl 8(%ebp), %esi` [2] `0c 00 00 00`

[3] `5a 00 00 00` [4] `jge .L5`

[5] `61 23` [6] `popl %esi`

2

Line 22 is buggy. (2')

The conditional code is incorrect. It should be "`jg .L4`". (2')

Problem 6: (10points)

1 [1] 00 00 00 00 [2] fc ff ff ff [3] 64 00 00 00

2 [4] array [5] R_386_PC32 [6] R_386_32

3 [7] 0x080483b3 [8]0xffffff9d