Solution

Problem 1: (14 points)

[1] 0011 [2] 0011 0001 [3] 1111 1111
[4] 1101 [5] 0010 [6] 1111 0011
[7] 0001 0000

Problem 2: (12 points)

[1] 0x7e2
[2] 0x1020300
[3] 0x7fffffff
[4] 0xefcdab00
[5] 0x1
[6] 0x44332211ffffffff
[7] 0x2018
[8] 0x201a
[9] 0xffffffff ffffffff
[10] 0x2028
[11] 0x1
[12] 0x00000000 00002030

Problem 3: (16 points)

1. [1] 0 [2] 8
   [3] 48 [4] 0x555555755050
   [5] 0x555555755068 [6] 0x555555755060
   [7] 0x555555755060 [8] 0x555555755040
2. 48 – (0+1+8*3+1+8) = 14
3. [1] 8 [2] 34
   [3] 0x555555755049 [4] 0x55555575505a

Problem 4: (16 points)

1. [1] 1023 [2] 1 11111111111 0000
   [3] 0 00000000000 1111 [4] 0 00000000001 0000
2. 1 10000000011 1010
3. 1 10000001110 0000

Problem 5: (22 points)

1 [1] 0x802018+ 8*(5*i + j)

[2] 0x802068

[3] 1

[4] 0

[5] 2

2 [1] 5 [2] 3

[3] 5 [4] a < 4 ?result-a: a-result ;

[5] .L2 [6] -16(%rbp)

[7] *%rdx [8] .L13

[9] sarq [10] movq -24(%rbp), %rax / nop

3 -2

Problem 6: (20 points)

1 [1] 400523 [2] mov %rdx,%rsi

[3] mov %rax,%rdi [4] add %rbx,%rax

[5] add $0x18,$rsp [6] pop %rbx

[7] pop %rbp / leaveq [8] sub $0x40,%rsp

2 40

3 a. between 0 (2') and 37 (2')

b. x = 46 ret addr = 0x400500

x = 47 ret addr = 0x400000

x = 55 ret addr = 0x101512

x = 56 ret addr = 0x10151200

x = 57 ret addr = 0x101512000c

x = 58 ret addr = 0x101512000c11

x = 75 ret addr = 0x502004005be