Solution

Problem 1

[1]	1111 1110	[2]	0010
[3]	1000	[4]	1111 1110
[5]	0000 0001	[6]	0011 0100

Problem 2

[1]	0x102030	[2]	0x7e4
[3]	0x1fffffff fffffffe	[4]	0xefcdab89 67452301
[5]	0xffffffff ffffffff	[6]	0x7e4
[7]	0x1000000e	[8]	0x1fffffff fffffffe
[9]	0x3000002a5	[10]	0x2018

Problem 3

1. [1] 31 [2] 0x7e00
   [3] 0x7dff [4] 0x8001
2. 0x43f2
   sign:0x0 exp:0x21 frac:0x1f2

Problem 4

1. [1] 8 [2] 8
   [3] 0x550000001040 [4] 0x550000001048
   [5] 0x550000001050 [6] 0x550000001050
   [7] 0x550000001050 [8] 0x550000001058
2. 32 - (8+4+8+1) = 11 Or 4+7=11
3. 3 bytes are wasted. Place "char c" before "union u", or "union u" before "int flags".

Problem 5

1	[1] case 35	[2]	ret = *yp
	[3] case 36	[4]	5
	[5] .L4	[6]	.L8
	[7] .L3	[8]	.L5
2	[1] 0x12345688	[2]	0x12345688
	[3] 0x88775678	[4]	0x0

Problem 6:

1 [1]: Pass y as the first argument to function Q.

[2]: Save return value of Q as %rax will be modified by second call to Q in line 10.

2 No. Because %r12 is callee saved register, but P does not preserve its old value (unless %rbp in line 2 and line 14 are also changed to %r12).

3 No. Because %r11 is caller saved register, so it might be changed by invocation of Q in line 7, however P use it in line 9 without saving its value in line 5.