1.

a)

add x_5, x_7, x_1

b)

ldur x_0, [x_6, 16]

c)

sub x_0, x_5, $x_1$1
cbz x_0, END

d)

lsr x_{10}, x_9, 15

2.

a)

The instruction can be written in binary and it shows as follows,

$$11111000000000100000000101001001$$

So in hex, it should be,

$$0xF8020149$$

b)

The instruction can be written in binary and it shows as follows,

$$10010001000000000010000011001001$$

So in hex, it should be,

$$0x910020C9$$

3.

a)

First we need to transfer it into binary,

$$0x8B000000 = 10001011000000000000000000000000$$

The opcode should be 10001011000 and it is add, so the instruction is,

$$add \quad x_0, x_0, x_0$$

b)

First we need to transfer it into binary,

$$0xB4016B54 = 10110100000000010110101101010100$$

The opcode should be 10110100 and it is cbz, and the address is 0000000101101011010, so the instruction is,

$$cbz \quad x_{20}, 0xB5A$$

4.

a)

I will do it step by step. I will ignore the first 7 0s in hex because I donnot need it.

$$x_{10} = 00001010101010101010101010101010$$
$$x_{12} = 10101010101010101010101010100000$$

Then I will write x_{12} and x_{11} then do orr.

$$x_{12} = 00000000000000000000000000010101010101010101010101010100000$$
$$x_{11} = 00010010001101000101011001111000000100100011010001010110011111000$$
$$x_{12} = 00010010001101000101011001111010101110101011111011111111011111000$$

In hex, it should be,

$$x_{12} = 0x1234567ABABEFEF8$$

b)

$$x_{12} = 00000000000000000000000000000000010101010101010101010101010101$$
$$immediate = 00000000000000000000000000000000000000000000000000000111111101111$$
$$x_{12} = 00000000000000000000000000000000000000000000000000000010101000101$$

In hex, it should be,

$$x_{12} = 0x0000000000000545$$

5.

a)

subi x_2, x_2, 5
add x_0, x_1, x_2

b)

sub x_3, x_3, x_4
lsl x_8, x_3, 3
add x_9, x_6, x_8
ldur x_{10}, [x_9, 0]
stur x_{10}, [x_7, 8]

c)

sub x_0, x_0, x_1
cbnz x_0, ELSE
addi x_3, x_3, 1
b END
ELSE: addi x_3, x_3, 2
END