2.4 f g h i j A B

x5 x6 x7 x28 x29 x10 x11

x30 = f*8

x30 = &A[f]

x31 = g*8

x31 = &B[g]

ld x5, 0(x30) ⇒ f=A[f]

x12 = &A[f+1]

x30 = A[f+1]

x30 = A[f+1] + A[f]

Answer: B[g] = A[f+1] + A[f]

2.6 $2\times16^0 + 1\times16^1 + 15\times16^2 + 14\times16^3 + 13\times16^4 + 12\times16^5 + 11\times16^6 + 10\times16^7$

= 2882400018

2.13

sd x5, 32(x30)

① S-type

② ~~0000000 00101~~

② 0000001 00101 11110 011 00000 0100011

⇒ Hex: 0x25F3023

2.15

The instruction type:

I-Type

The assembly language instruction:

ld x3, 4(x27)

The binary representation:

0000 0000 0100 1101 1011 0001 1000 0011

2.29

```
fib:  addi  sp, sp, -24
      sd    x18, 16 (sp)
      sd    x19, 8 (sp)
      sd    x20, 0 (sp)
      bgt   x20, x0, test
      add   x21, x0, x0
      j     rtn
test: addi  x22, x0, 1
      bne   x22, x20, gen
      add   x21, x0, x22
      j     rtn
gen:  addi  x20, x20, -1
      jal   fib
      add   x19, x21, x0
      addi  x20, x20, -1
      jal   fib
      add   x21, x21, x19
rtn:  ld    x20, 0 (sp)
      ld    x19, 8 (sp)
      ld    x18, 16 (sp)
      addi  sp, sp, 24
      jr    x1
```

2.30

after calling function fib :

old sp → 0x7fffffffc

	-8	contents of register X1 for fib(N)
	-16	contents of register X2 for fib(N)
-sp→	-24	contents of register X3 for fib(N)

there will be N-1 copies of X1, X2 and X3.

2.32

```
int f(int a, int b, int c, int d)
{
    return g(g(a,b), c+d);
}
```

- Last line of the provided function f is used to represent the tail-call optimization.
- Yes, user can use the tail-call optimization in this function.

2.34

```
main:   addi  sp, sp, -8
        sd    x18, 0(sp)
        add   x19, x0, 0x30   # '0'
        add   x20, x0, 0x39   # '9'
        add   x21, x0, x0
        add   x22, x23, x0
Loop:   ld    x24, 0(x22)
        slt   x25, x24, x19
        bne   x25, x0, DONE
        slt   x25, x20, x24
        bne   x25, x0, DONE
        sub   x24, x24, x19
        beq   x21, x21, 10
FIRST:  add   x21, x21, x24
        addi  x22, x22, 1
        j     Loop
DONE:   add   x26, x21, x0
        ld    x18, 0(sp)
        addi  sp, sp, 8
        jr    x1
```