1.(a) (100,256,256,3)

(b) (40, 2400, 80)

(c) (32, 300, 512, 512,3)

2

(a)

(b)the size of Z[i,j] is (5,4)

(c) the largest positive value of Z[i,j] is 6 , the pixel can be (3,1)

(d) the largest negative value of Z[i,j] is -6, the pixel can be (3,0)

(e)the pixel can be (0,1)

3.

(a) the shapes of Z and U are both (46,62,20).

(b)the input channel is 10, the output channel is 20.

(c) ，there are 90 multiplications to be performed.

(d) 3 \* 3\* 10\* 20 +20 = 1820, there are 1820 trainable parameters in this layer.

4.

(a)

so

(b)

(c) = =

5.

(a) y = [1, 3, 0, 1]

(b) y = [2, 3, 10, 1]

(c)

sub\_sampling y[i,k,n] = X[i, sk, n], k = 0, 1, 2, …,

max\_pooling y[i,k,n] = , k = 0, 1, 2, …,

output shape = (B, , C)