# 一 . 判断题

一共十道判断题，总共十分，时间不够了，我没有记下来。

二 . 简答题

1. what are the meaning of **Image Sampling** and **Quantization** (6 ponits)
2. describe the main idea of optimal edge detector **Canny**, and then give its processing steps (6 points)
3. present one or more descriptors to classify these three character, **A, B, C (6 points)**
4.
    1) **RGB** values of A is (70, 50, 80), B(60, 100, 90), calculate the coordinates of A, B in **CIE** (6 points)
    2) C is composed of A(25%), B(75%), calculate the coordinates of C in **CIE** (6 points)

5. Image with 8 gray levels, and its histogram is as follow, fill the result, and draw the new histogram.

rk	Pr	Sk	Ps
1			
2			
3			
4			
5			
6			
7			
8			

histogram

灰度级分布

■1 ■2 ■3 ■4 ■5 ■6 ■7 ■8
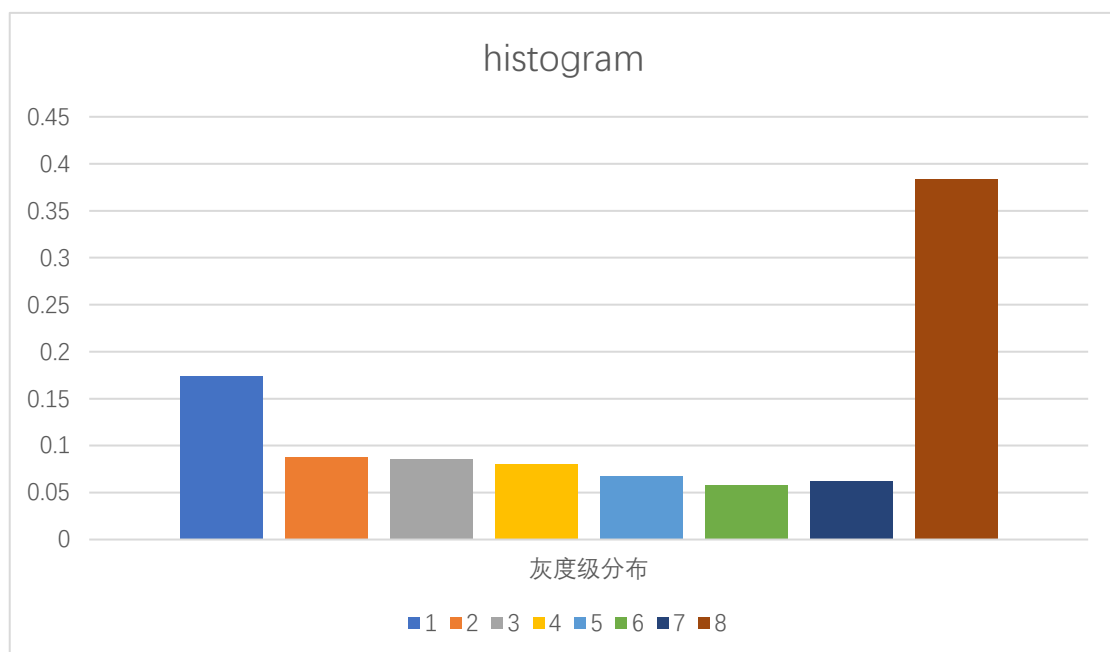
6. Analyze the image properties.
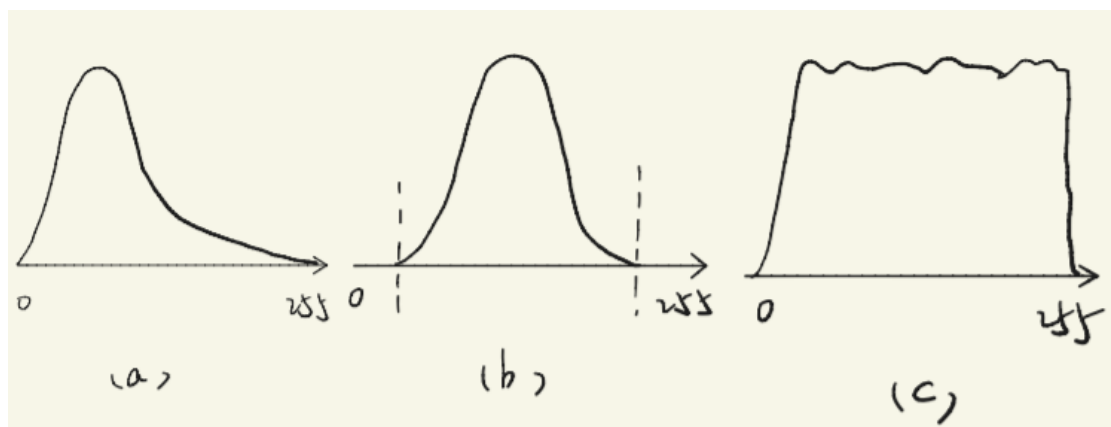
7. 8 bits image as below（注意是 8bits，不是 8 gray levels）

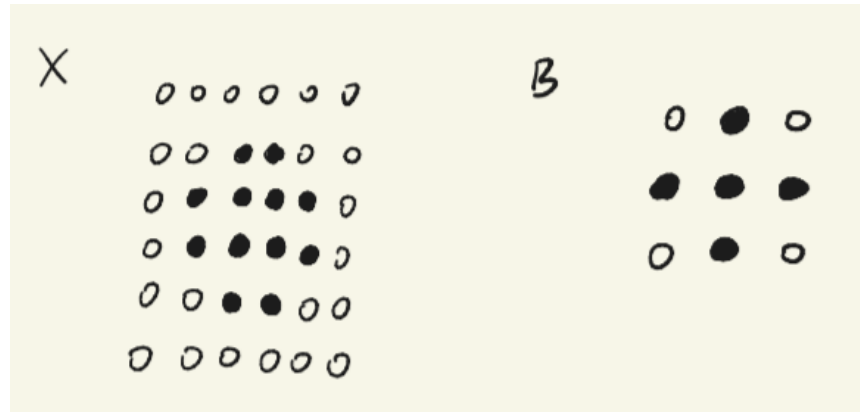| Y/X	1	2	3	4	5
1	3	7	6	2	0
2	2	4	6	1	1
3	4	7	2	5	4
4	3	0	6	2	1
5	5	7	5	1	2

1) result of 3*3 average filter (4 points)
2) result of 3*3 median filter (4 points)
3) image enhancement by **Laplacian mask** (4 points)

8.
1) Given X={(1,2),(1,-1),(0,3)}, B={(-1,0), (0,1), (0,0)}   z = (-1,1), Xz = ? B? (4

points)

2) Y1=X (erosion) B ? Y2=X^c(dilation) B$^\wedge$?

9.

1) Calculate the **Huffman coding** of S0-S7.

S0	S1	S2	S3	S4	S5	S6	S7
0.4	0.18	0.1	0.1	0.07	0.06	0.05	0.04

2) The average length of coding? Comparing with fixed-length coding, compression ratio? Code redundancy?

三. 备注：

① 纯英文试卷，老师说最好英文答题，真不会也可以用中文。
② 可以带计算器，可以带词典，PPT，书本，不能带其他电子设备。