Lab 2. Task 1- preparation task
Template for answers

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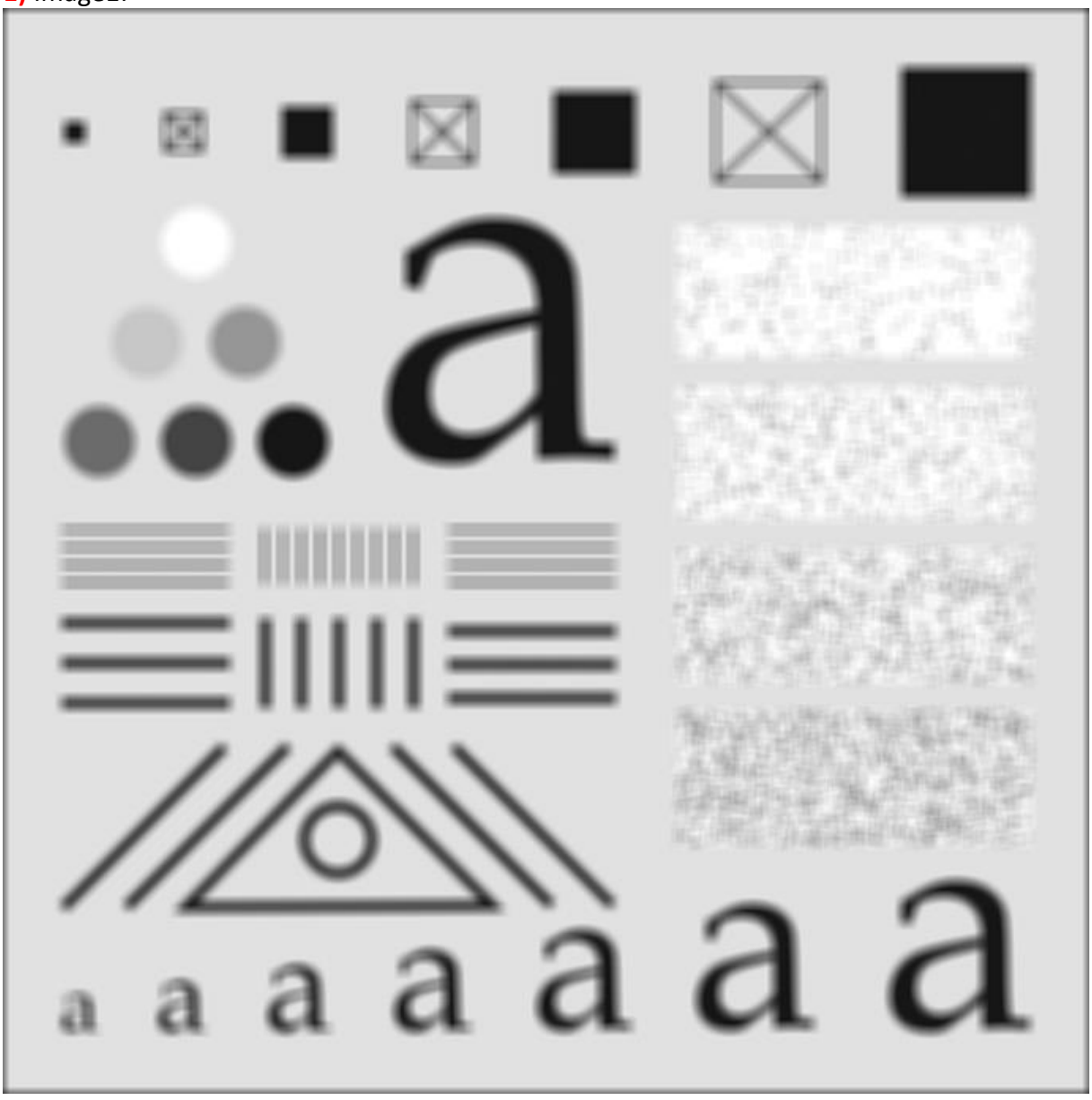
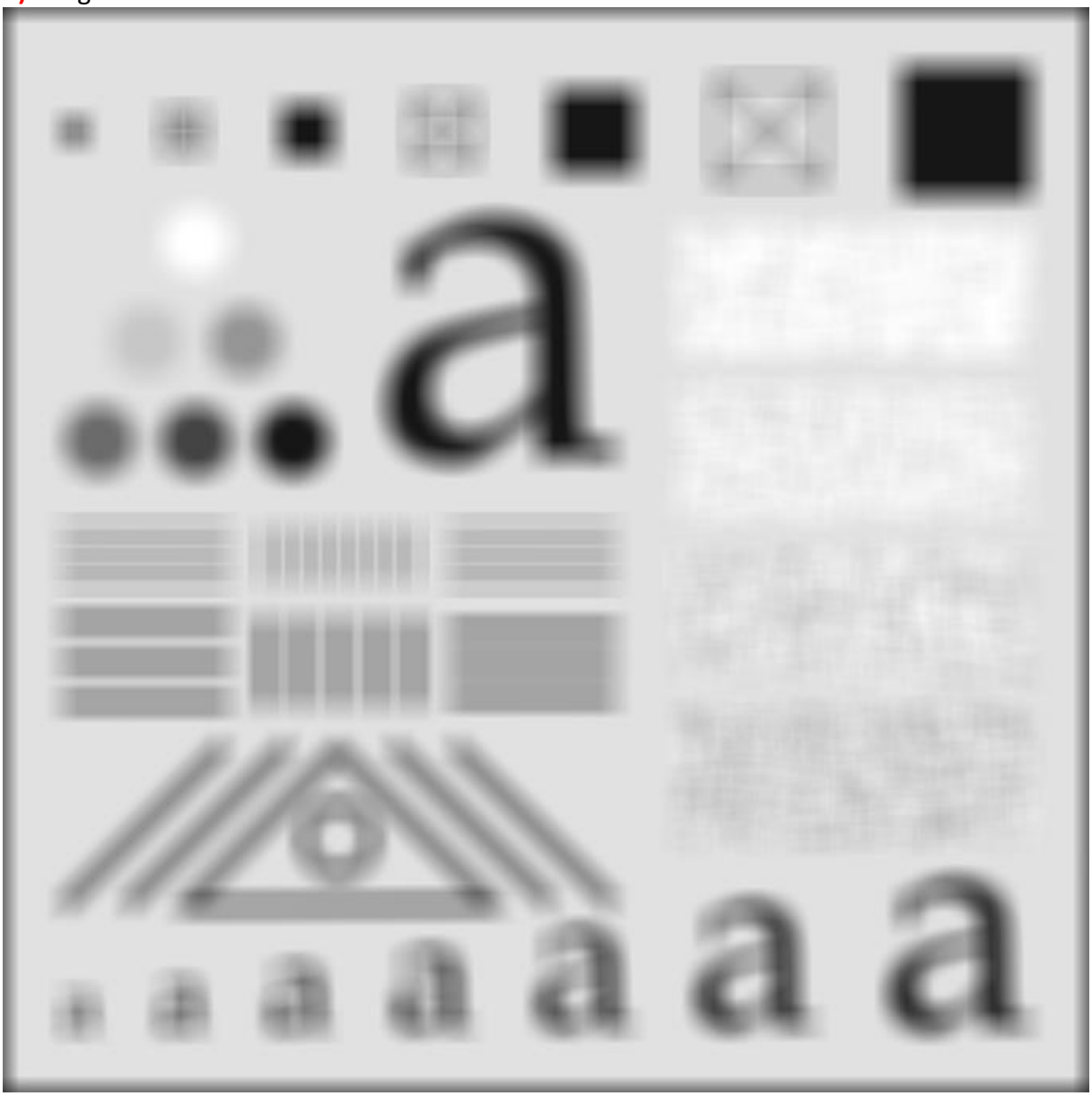
Version (in case you need to re-submit): 2

1) Testing different box filters

1) Image1:



2) Image2:



3) Image3:

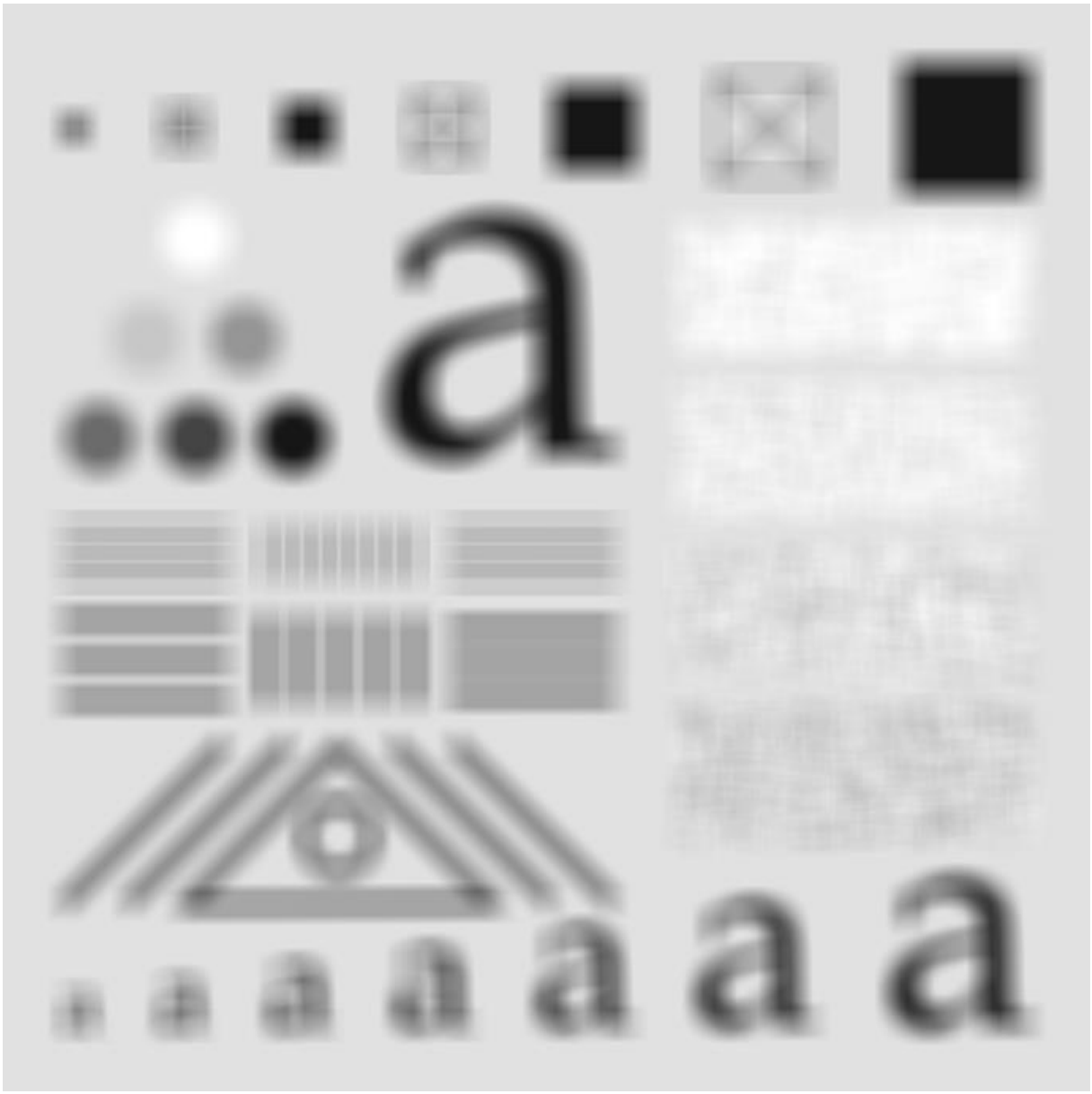
4) Which of the three filter kernels in problems 1, 2, and 3 represents the lowest and highest cut-off frequencies? Explain why.

One rule to remember is that the blurriest image has the lowest cutoff frequencies. So we would say that the image with the lowest cutoff frequencies is Image2. And the highest cutoff frequencies is in Image1.

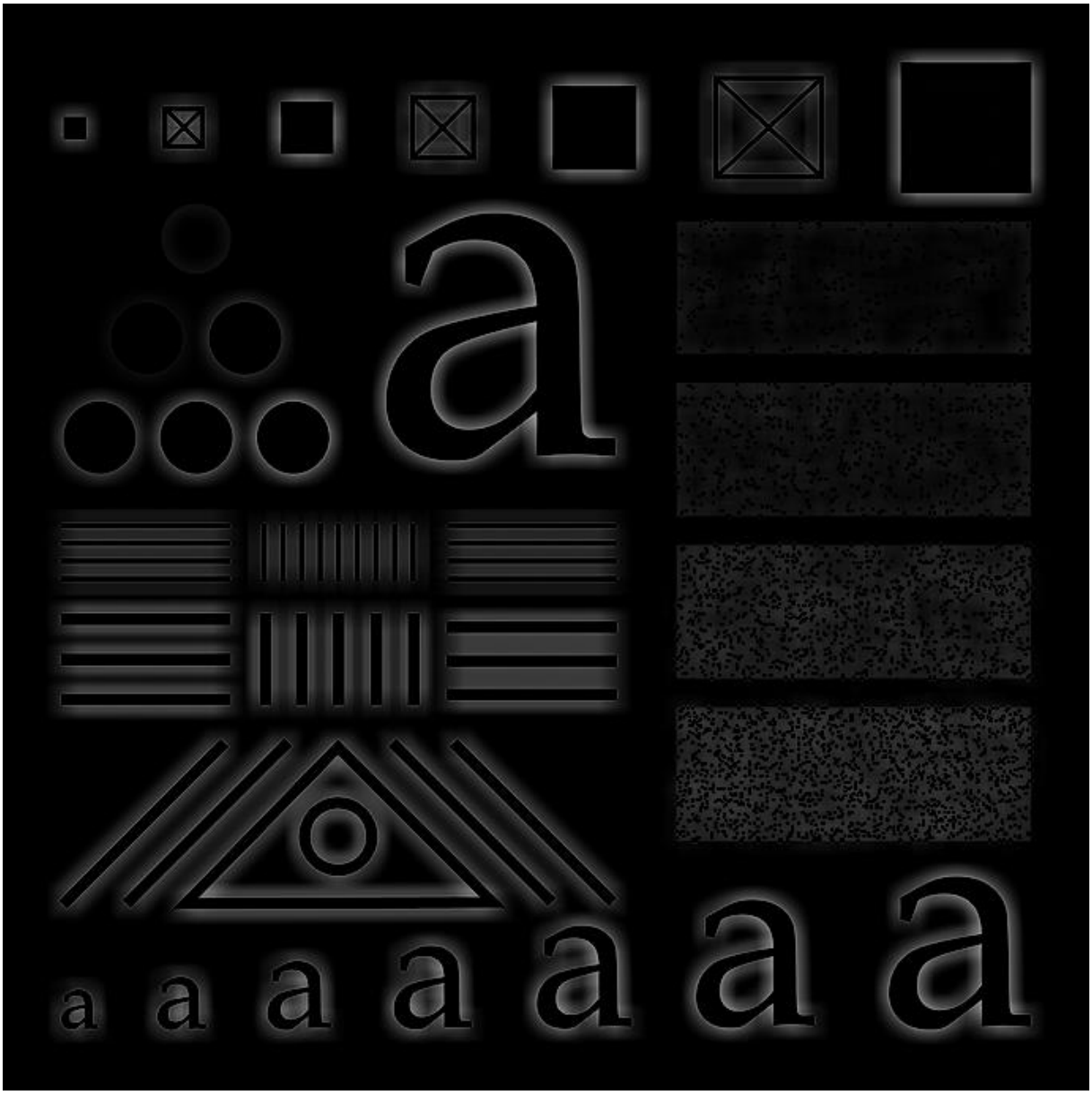
5) Provide a detailed explanation of why zero-padding leads to dark borders and how the width of these borders is connected to the size of the filter kernel.

As we are using the zeros from the zero padding as a contribution to the pixel values the intensity values are lowered, leading to dark edges. If the kernel grows in width, there are more zeroes that contribute to the intensity.

6) Image4:



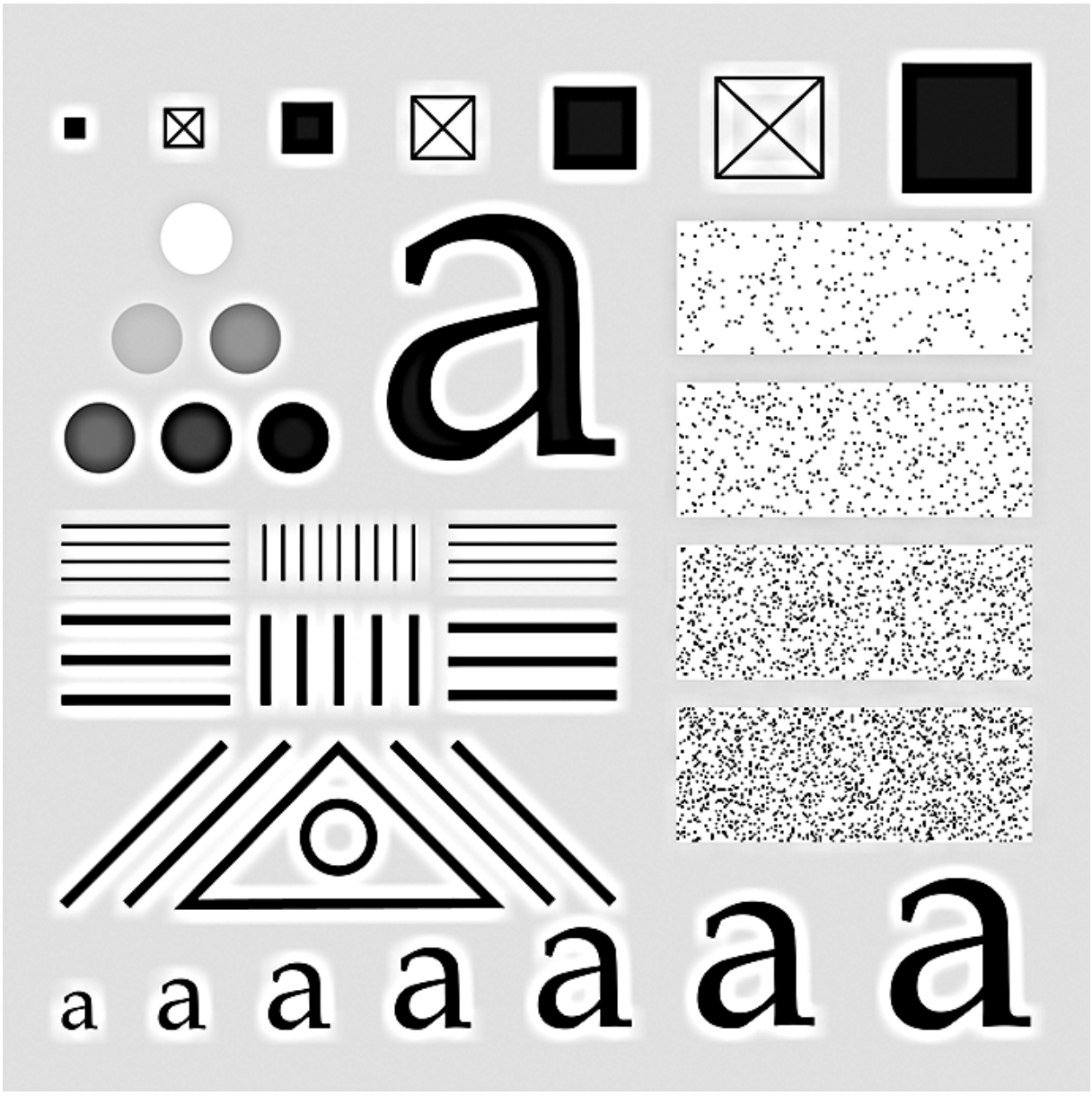
7) Image5:



8) Why is $Image5$ quite dark? What should the average value of the pixel values in $Image5$ be, and why?

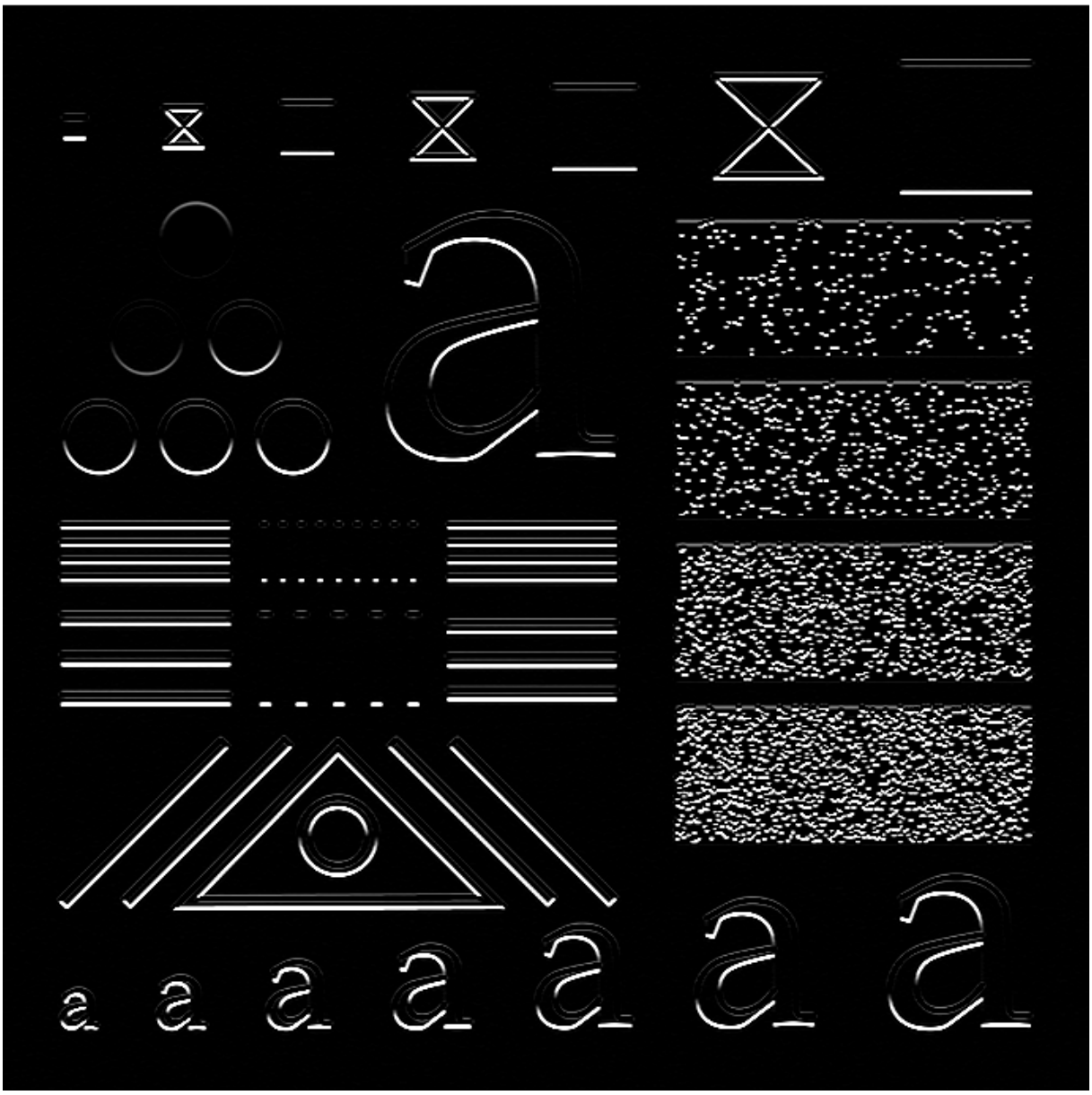
Since we applied a high-pass filter we only keep the high-frequency detailed components from the image such as edges. The average pixel-value in the image should be close to 0

9) Image6:

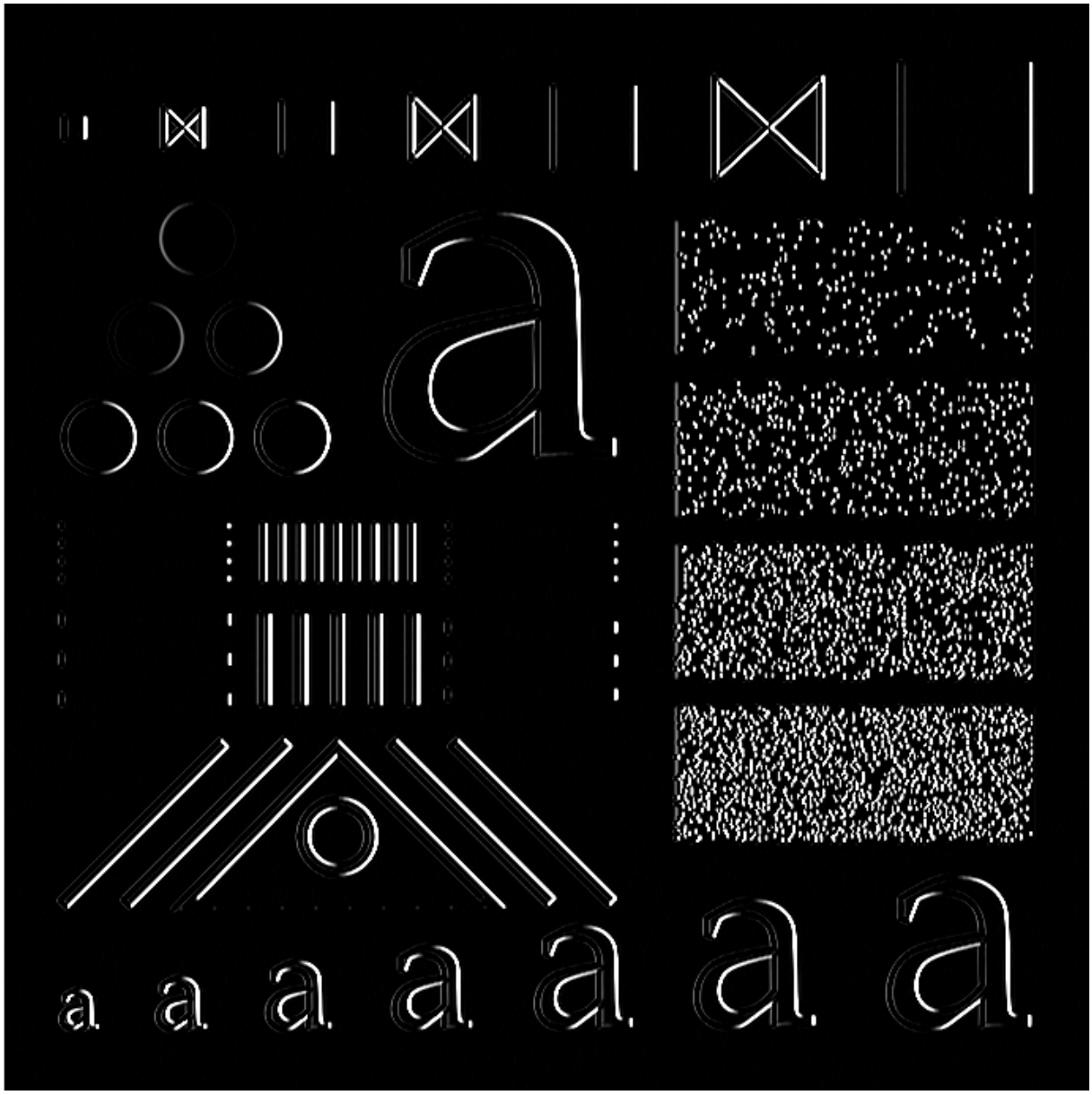


2) Testing Sobel filter kernels and gradient

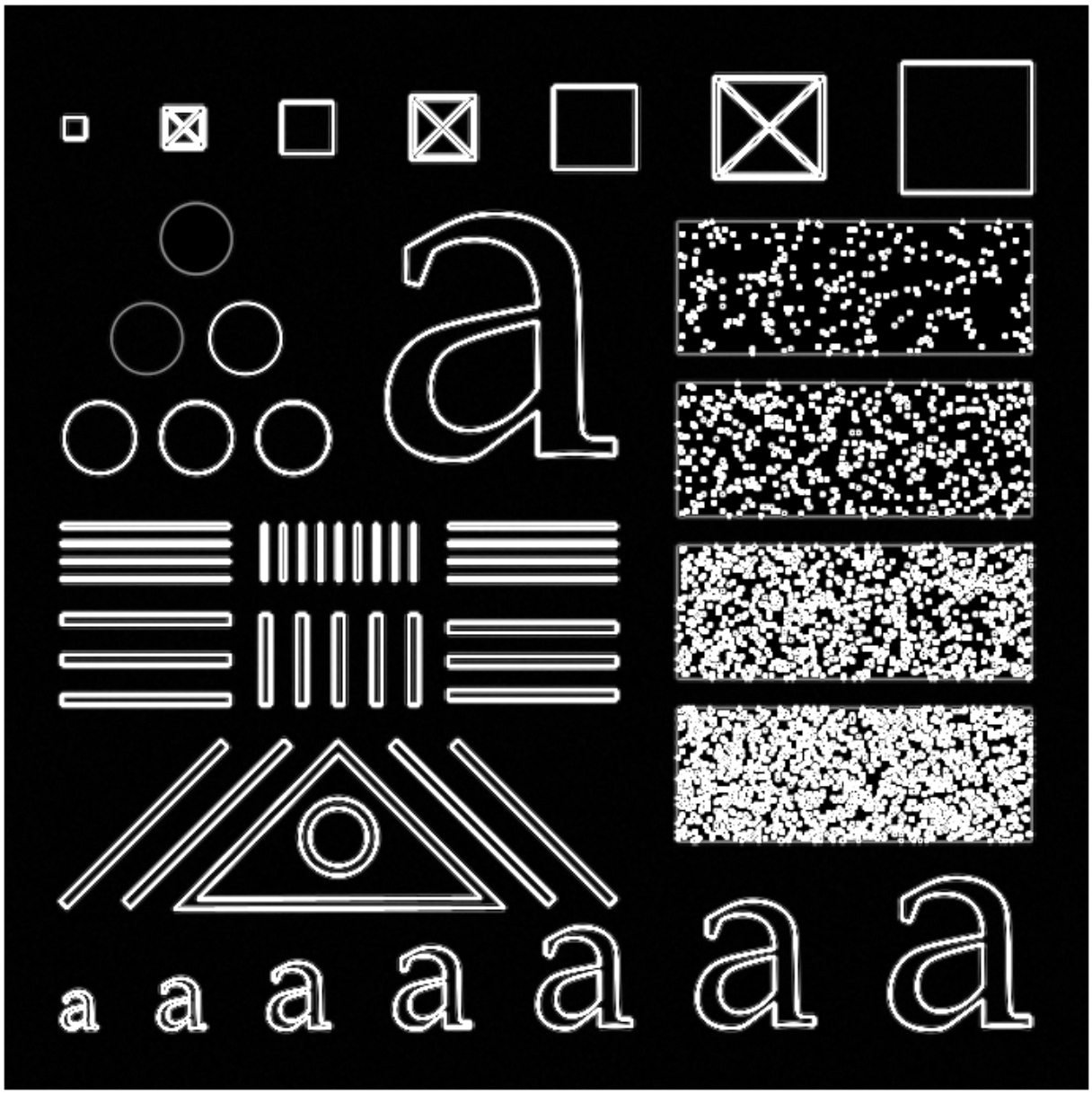
10) Image7:



11) Image8:



12) Image9:



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