

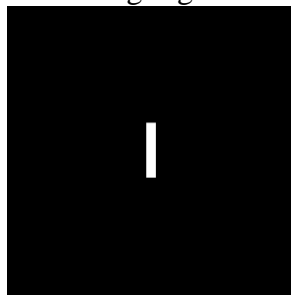
Instructions:

- i. CLOSED book exam. No browsing. Keyboard use is prohibited.
- ii. Keep your camera ON throughout the test time.
- iii. Write your Student ID & Page Number at the top of each page.
- iv. At the end of the test, take pictures of your script, and convert it to a single pdf file. Rename it as **STUDENTID_CT4.pdf**
- v. Capture & Submit during the upload session ONLY. DO NOT take pictures or upload even if your exam finishes early.

Questions:

1. Consider the two images given in Figure 1.

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(a)



(b)

Figure 1: (a) Original image (b) Image where the object's position has been shifted.

The spectrum values of the DFT $F(u,v)$ of the above two images will be identical. In other words, magnitude of $F(u,v)$ is independent of translation. Explain why.

2. Why do Ringing effects appear in the output image if an Ideal filter is applied? 5
3. Among the following three types of filter, which one do you prefer? Justify your choice. 3
 - i. Ideal
 - ii. Butterworth
 - iii. Gaussian