

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-DIP2021.pdf**
- v. Capture & Submit during the upload session ONLY. DO NOT take pictures or upload even if your exam finishes early.

Questions:

1. Briefly explain when and why false contouring may appear in gray-scale images. 5
2. When is an operation H called linear? The median, ζ , of a set of numbers is such that half the values in the set are below ζ and the other half are above it. For example, the median of the set of values $\{2, 3, 8, 20, 21, 25, 31\}$ is 20. Prove that an operator H that computes the median of a subimage area, is nonlinear. 5
3. Consider the two sub-regions in an image, R_i and R_j , shown in Figure 1. For $V = \{1\}$ as the valid intensity for traversal, determine whether these two subregions are (i) 4-adjacent, (ii) m -adjacent. Explain your answers. 2.5×2

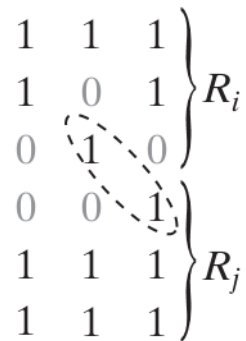


Figure 1.